Shareholder Litigation and Corporate Default Risk

Chaoran Yang
Cranfield School of Management, Cranfield University, UK
Chaoran.Yang@cranfield.ac.uk

Abstract

This study examines the effects of shareholder litigation on corporate default risk. Exploiting the staggered adoption of the universal demand (UD) laws by 23 U.S. states between 1989 and 2005 as an exogenous shock to derivative litigation, we find that weakened shareholder litigation rights due to the implementation of UD laws increase corporate default risk measured by expected default frequency (EDF). The positive relation between UD laws and EDF is more pronounced for financially constrained firms. Our results are robust to credit ratings as the alternative measure of default risk and different endogeneity tests including propensity score analysis and entropy balancing. The results also extend to the 1999 ruling of the Ninth Circuit Court of Appeals on securities class action lawsuits. Further channel analyses show that the increase in corporate default risk following the passage of UD laws can be explained by the deterioration in corporate governance, the increase in firm performance volatility, the reduction in corporate strategy conformity, and the increase in the cost of capital. We find no evidence that the UD laws contribute to corporate risk-taking, suggesting that our results are driven by erratic and arbitrary decision-making rather than difficult decision-making such as risky investments. Overall, our study highlights the importance of shareholder litigation rights as an external governance mechanism in mitigating firm-level default risk.

Keywords: Default Risk, Shareholder Litigation, Universal Demand Laws, Securities Class Action Litigation, Derivative Lawsuits, Corporate Governance

JEL Classification: G33, G38, K40

1. Introduction

In the competitive business environment, the company will be inevitably exposed to various risks affecting its business operation and sustainable development. Among these, the default risk raises great concern regarding the potential disruption of corporate financial stability. The default event happens when the firm's cash flow is not sufficient to meet its debt obligations, which will have negative impacts on supply chain management, customer retention, administrative cost control and even firm productivity (Brogaard, Li, and Xia, 2017). Default is one of the most catastrophic events the firm can experience and it involves investors, creditors, customers and other stakeholders. A default event can cause negative consequences that could endanger every aspect of the firm. Thus, the study on corporate default has important implications for academics and practitioners.

Existing studies on firm default highlight the importance of corporate governance in determining corporate default risk (Bhojraj and Sengupta, 2003; Ashbaugh-Skaife, Collins, and LaFond, 2006; Fich and Slezak, 2008; Chava, Livdan, and Purnanandam, 2009; Cao et al., 2015; Brogaard, Li, and Xia, 2017; Ali, Liu, and Su, 2018; Baghdadi, Nguyen, and Podolski, 2020; Balachandran et al., 2023). Corporate governance mechanisms effectively mitigate agency costs by monitoring and disciplining managers' opportunistic behaviours and erratic decision-making, decreasing the volatility of future cash flow, and ultimately resulting in lower default probability. Notably, shareholder litigation serves as an important external governance mechanism providing strong legal protection for shareholders to deter management misconduct. Prior studies document that shareholder litigation has a significant impact on the cost of external financing (Deng, Willis, and Xu, 2014; Ni and Yin, 2018; Arena, 2018; Houston, Lin, and Xie, 2018; Nguyen, Phan, and Lee, 2020). Investors and debtholders include litigation risk in pricing the required risk premium when they assess the firm's credibility and repayment ability. However, it is less clear whether and how shareholder litigation directly affects corporate default risk. Therefore, in order to empirically investigate the causal effects of shareholder litigation on corporate default risk, in this paper, we exploit exogenous variations in the threat of derivative litigation following the staggered state-level adoption of the universal demand (UD) laws and in the security risk caused by the 1999 ruling of the Ninth Circuit Court of Appeals.

how the company is governed by the external mechanism of shareholder litigation depends on the type of lawsuit. In the United States, there are two forms of juridical proceedings available to shareholders to address the company's corporate governance concern. That is, direct lawsuits (security class action lawsuits) and derivative lawsuits.

A derivative lawsuit is filed by shareholders on behalf of the corporation to deal with the alleged wrongdoings done by corporate insiders. On the contrary, a security class action lawsuit is filed by the class of plaintiff shareholders to address the direct harm to them arising from security fraud. By its nature, the most significant difference between these suits is where the financial recovery from this type of lawsuit actually goes. Specifically, the financial recovery directly goes to the class of plaintiff shareholders in a security suit, whereas goes to the corporation treasury rather than shareholders in a derivative lawsuit. Since cash settlements occur mainly in security litigation, derivative litigation primarily targets the firm's directors and officers for their breach of fiduciary duties, thereby improving corporate governance mechanisms. Chung et al. (2020) argue that the governance of firms affected by security class action is expected to be weaker than those of firms exposed to derivative litigation risk. Thus, this paper focuses more on whether and how derivative lawsuits affect the level of corporate default risk, which is more relevant to the external governance tool as the determinant of default risk. In practice, these two types of lawsuits have coexisted as complements or substitutes in the legal framework. If shareholders find it difficult to file one form of the lawsuit, they may use alternative ways to make legal claims for addressing corporate governance problems. Thus, we also explore the effects of security litigation on default risk and this will help us fully understand the association between shareholder litigation rights and corporate default risk.

Furthermore, an investigation of the effects of shareholder litigation on the corporate default risk is prone to endogeneity concerns due to omitted variables and reverse causality, which could lower the validity of the statistical inferences. For example, the litigation risk can increase as the firm approaches defaults. To address potential endogeneity issues, we exploit the staggered adoption of universal demand (UD) laws across 23 U.S. states between 1989 and 2005 as an exogenous shock to the derivative litigation risk to make causal inferences regarding the relation between shareholder litigation rights and corporate default risk. The adoption of UD laws imposes a significant procedural obstacle to initiating derivative lawsuits. Since the availability of demand futility causes more frivolous derivative litigation, the UD laws enactment restores the use of demand requirement in every derivative lawsuit and requires shareholders to make a demand on the boards to remedy wrongdoings before proceeding with derivative suits. As a result, following the passage of UD laws, shareholders find it more difficult to file a derivative suit against wrongdoers because the board of directors usually reject such demands to side with corporate insiders named as defendants. The UD laws are enacted in different states at different times, representing the variation in the litigation risk at the level of state of incorporation, so it is plausibly exogenous to the litigation environment and corporate policy. Its

exogeneity provides us with a valid setting to identify the causal effects of reduced legal deterrence on the firm default risk.

We propose two opposing hypotheses regarding the effects of UD laws enactment on corporate default risk. The first hypothesis posits that the adoption of UD laws increases corporate default risk. The legal system provides protection for shareholders to address agency problems as a result of corporate control (La Porta et al., 1998). Specifically, as one of the most distinctive legal frameworks, the prospects of shareholder litigation normally function as legal deterrence to monitor and discipline management by imposing direct pecuniary and non-pecuniary costs on managerial misbehaviours. Early research suggests that derivative litigation serves as an effective governance tool to improve corporate governance (Ferris et al., 2007; Erickson, 2009). However, since the adoption of UD laws impedes shareholders from pursuing derivative lawsuits, it may undermine the governance effectiveness of litigation rights, thereby aggravating managerial agency problems. Appel (2019) indicate that the company is inclined to introduce governance provisions that reinforce management entrenchment following the passage of UD laws. As the UD laws significantly weaken the discipline power of derivative lawsuits, managers become increasingly prone to engage in risk-taking and opportunistic behaviours, which lead to an increase in potential agency risk to shareholders. As a result, the increased agency risk intensifies firm performance volatility, leading to a higher likelihood of default. Additionally, as the passage of UD laws reduces legal deterrence of litigation rights and facilitates excessive risk-taking, outside investors will seek a higher rate of return on their investments to compensate for the increased agency costs and expropriation risk associated with reduced oversights, thereby increasing the cost of equity financing. Similarly, the debtholder might demand a risk premium in the lax litigation environment due to the increased risk-taking. Prior studies document that the adoption of UD laws increases the cost of equity (Houston, Lin, and Xie, 2018) and increases the cost of debt (Ni and Yin, 2018). Notably, the disciplinary power of debt can mitigate agency problems arising from corporate control. The firm may use more financial leverage to substitute for the weakened governance power of litigation rights following the passage of UD laws (Nguyen, Phan, and Lee (2020). However, the increase in the cost of debt and debt financing following the passage of UD laws could expose the firm to higher insolvency risk if the firm cannot generate sufficient cash flow to cover its debt services costs and principal payments, ultimately driving the firm into bankruptcy.

Alternatively, the competing hypothesis predicts that the adoption of UD laws decreases corporate default risk. Firms incur substantial financial costs from shareholder litigation, such as cash settlement and attorney fees. Romano (1991) indicate that the primary

beneficiaries of litigation are lawyers rather than shareholders. Arena and Julio (2023) show that the average settlement amount associated with corporate lawsuits is $61 million during the period from 2000 to 2015. In addition to direct pecuniary costs, shareholder litigation also does serious harm to the firm reputation. Although directors and officers liability insurance (D&O insurance) is used to cover the cost of lawsuits, it does not fully insulate the firm from the effects of derivative lawsuits. For example, the coverage of D&O insurance is invalid in cases of dishonesty and intentional wrongdoings in a derivative lawsuit. These litigation costs will have adverse effects on the firm's operation, thereby significantly destroying the firm profits and value. Debtholders will demand a risk premium to compensate for the potential litigation risk. Likewise, credit rating agencies are inclined to incorporate litigation risk into the evaluation of the firm's credibility and repayment ability. Arena (2018) finds that firms exposed to higher litigation risk have lower the firm's credit ratings and their cost of debt will be higher. In this regard, litigation risk may have a direct and positive association with default risk. Furthermore, since shareholder lawsuits will have deterrence effects on managers' job security and personal reputation, managers are more likely to pursue conservative and risk-averse corporate policies that avoid potential litigation risk. Some lawsuits are meritless and do not provide strong evidence that managers certainly involve in alleged wrongdoings. Instead, such lawsuits waste the firm's assets and even deviate managers' attention from normal business. Lin, Liu, and Manso (2021) show that shareholder litigation discourages managers from engaging in innovation activities. Nguyen, Phan, and Sun (2018) discuss that the increase in corporate cash reserves is a precaution taken by managers against future litigation costs. The decrease in investment in corporate innovation will make the firm lose its competitive advantage in the market, which greatly erodes its firm performance and thus increases default risk. Hsu et al. (2015) indicate that innovative firms will have lower default risk. This line of argument implies that a significant decline in litigation risk following the passage of UD laws will decrease corporate expected default probabilities. Taken together, the net effect of shareholder litigation on corporate default risk should be an empirical question based on the opposing argument about the relation between shareholder litigation and default risk.

To answer this question, we measure corporate default risk using the expected default frequency (EDF) developed by Brogaard, Li, and Xia (2017). Merton (1974) first proposes a comprehensive method to estimate firm default risk based on accounting-based and market-based fundamentals. Specifically, Merton (1974) views the firm's equity as a call option on its underlying asset, where its strike price is equal to the face value of its debt. The firm default occurs in cases where the firm's asset value is lower than the face value of the debt. The distant-to-default (DD) measure is firstly derived

from Merton (1974) model and it gauges how far the asset value of the firm is from the face value of its debt. Then, as we substitute it into a cumulative standard normal distribution, the computing result reflects the probability that the asset value of the firm is lower than its debt face value, namely the probability of default. Bharath and Shumway (2008) further simplify the calculation of the Merton model by retaining the Merton model's inputs and the same functional form without the iterative solution procedure. Unlike the measure by rare bankruptcy events, the estimation of EDF from Bharath and Shumway (2008) allows us to explore the cross-sectional and time-varying default risk, which is not restricted to the small sample size of the firm. Bharath and Shumway (2008) find that the EDF outperforms the DD measure of the Merton model at out-of-sample forecasts of bankruptcies.

With EDF proxying for our corporate default risk, we examine the effects of the adoption of UD laws on corporate default risk in a difference-in-differences (DID) approach. This approach enables us to compare the difference in corporate default risk before and after the passage of UD laws between treatment firms and control firms throughout the sample periods. Our regression model controls for variables that contribute to the explanation of corporate default risk as suggested in the literature (Bharath and Shumway, 2008; Brogaard, Li, and Xia, 2017; Baghdadi, Nguyen, and Podolski, 2020; Balachandran et al., 2023), including the market value of equity, face value of debt, stock volatility, excess return, ROA, book-to-market, institutional ownership and independent board. Using a sample of 33,173 firm-year observations of 5,900 U.S. public firms during the period from 1993 to 2010, we find that the adoption of UD laws significantly increases corporate default risk. These results hold even when we control for additional state-level GDP factors and firm and year and state-fixed effects. These results are also economically significant, our estimation shows that the adoption of UD laws leads to an increase in EDF by at least 0.021, which is equal to 33% of its sample mean.

Next, we conduct a battery of tests to address endogeneity concerns that might drive our baseline DID results. First, although the passage of UD laws is likely to be exogenous to shareholder litigation risk and firms, we cannot directly eliminate reverse causality that default risk creates conditions for firms to choose their litigation environment. We conduct validity tests in which we find that the preexisting EDF do not affect the enactment of UD laws and the adoption of UD laws does not change firm choices in the state of incorporation. Second, in a DID setting, both UD laws passage and default risk might follow time trends, which implies that the relation between the two is not causal but spurious. To mitigate this concern, we exploit a dynamic model to examine the timing of the effects of UD laws adoption on corporate default risk and we

find that EDF increases following the adoption of UD laws but not before that, suggesting that such spurious relation between the UD laws passage and corporate default risk does not exist in our empirical results. Third, the increase in corporate default risk following the adoption of UD laws might be driven by omitted variables. To rule out this possibility, we employ both propensity score matching (PSM) and entropy balancing techniques to control for systematic differences between firms incorporated in the UD laws adopting states and those without. Our results remain consistent after rerunning DID regressions using a PSM sample and an entropy-balanced sample. Finally, to further validate our baseline inferences, we conduct several robustness checks to examine whether the effects of UD laws adoption on firm default risk are driven by the adoption of other confounding state-level laws, Delaware effect, corporate lobbying, and crisis shock. Our findings persist after including Business Combination (BC) laws and Poison Pill (PP) laws, excluding firms incorporated in Delaware state, restricting the sample of treated firms to those incorporated in Pennsylvania state, and excluding dot-com and global financial crisis periods.

Furthermore, we conduct additional robust checks to mitigate measurement error concerns by using credit rating as the alternative measure of corporate default risk. In doing so, we assign numerical values ranging from 1 to 22 to S&P long-term credit ratings ranging from AAA to D where higher credit values represent greater default risk. We find that the adoption of UD laws has a positive and significant relationship with credit rating. In addition, since shareholders may pursue security litigation as an alternative and indirect way in which shareholders initiate judicial proceedings against directors and officers for their breach of fiduciary duties, we examine whether our findings apply to securities class action lawsuits. We exploit the 1999 ruling of the Ninth Circuit Court of Appeals that makes it harder for shareholders to initiate security class action lawsuits against firms headquartered in the Ninth Circuit to examine the relationship between corporate default risk and security litigation. Similarly, we find that the reduction in security litigation risk following the 1999 ruling leads to an increase in EDF.

Compared to financially unconstrained firms, financially constrained firms are more likely to suffer from insufficient internal cash flow and struggle to secure debt finance. Previous studies document that the adoption of UD laws increases the cost of external finance and debt financing (Ni and Yin, 2018; Houston, Lin, and Xie, 2018; Nguyen, Phan, and Lee, 2020). It is likely that financially constrained firms find it more difficult to service their debt obligations compared to financially unconstrained firms following the adoption of UD laws. Thus, we expect that the positive relation between UD laws enactment and corporate default risk is more pronounced for financially constrained

firms. Using four different measures of financial constraints, including S&P long-term credit rating (Faulkender and Petersen, 2006), dividend payout (Fazzari, Hubbard, and Petersen, 1987), Whited-Wu (WW) index (Whited and Wu, 2006) and size-age (SA) index (Hadlock and Pierce, 2010) to sort firms into subgroup analysis, we find the results are consistent with our expectation.

Next, we shed light on the underlying channels through which the adoption of UD laws increases corporate default risk. First, we find that the adoption of UD laws leads to an increase in the G-index, E-index and the fraction of co-opted boards to the total boards, suggesting that the reduced legal deterrence due to UD laws increases management entrenchment and deteriorates corporate governance mechanisms. These results are consistent with the evidence documented in Ni and Yin (2018) and Appel (2019). Second, since the UD laws weaken the governance power of litigation rights to discipline managers, managers are allowed to have more discretion to make erratic and arbitrary decisions, which results in higher firm performance volatility and consequently greater default risk. However, the adoption of UD laws does not affect the level of corporate risk-taking. This is consistent with the quiet life hypothesis that entrenched managers are prone to pursue less risky corporate policies when UD laws insulate them from the threat of shareholder litigation. Last, the costly external financing increases the difficulty in the firm operation, which potentially damages its financial stability. Existing studies show that the UD laws are associated with the higher cost of debt (Ni and Yin, 2018) and the higher cost of equity (Houston, Lin, and Xie, 2018). Therefore, we present the cost of capital as an important channel for weakened shareholder litigation rights to increase firm default risk.

Our study contributes to two strands of the literature. First, it adds to a burgeoning stream of literature on shareholder litigation. A large body of research has examined the effects of litigation risk on a variety of corporate outcomes, including ownership structure (Crane and Koch, 2018), corporate governance provisions (Appel, 2019; Foroughi et al., 2022), corporate cash holdings (Arena and Julio, 2015; Nguyen, Phan, and Sun, 2018), the cost of external financing (Arena, 2018; Ni and Yin, 2018; Houston, Lin, and Xie, 2018), capital structures (Nguyen, Phan, and Lee, 2020), corporate innovation (Lin, Liu, and Manso, 2021), corporate takeover (Chung et al., 2020; Chu and Zhao, 2021; Huang, Ozkan, and Xu, 2023), corporate disclosure (Houston et al., 2019; Bourveau, Lou, and Wang, 2018; Boone, Fich, and Griffin, 2023), information environment (Le, Nguyen, and Sila, 2021), firm productivity (Bilokha and Gupta, 2024), firm investment efficiency (Li, Monroe, and Coulton, 2023), corporate payout (Do, 2021; Arena and Julio, 2023), and corporate social responsibility (Freund, Nguyen, and Phan, 2023). These studies cast doubts on whether the firm benefits from shareholder

litigation as an external governance tool. However, none of these studies explain the actual effects of the right to sue on the firm's creditworthiness. Default is viewed as one of the most significant disruptions a firm can experience in its lifecycle (Brogaard, Li, and Xia, 2017). Its occurrence is directly related to the firm's financial stability and operational performance, so it will be a good indicator in investigating the comprehensive effects of shareholder litigation on corporate outcomes. Thus, we build on these studies to first explore the causal relation between shareholder litigation and corporate default risk using the exogenous variation on litigation risk following two important legal events: the staggered adoption of UD laws and the 1999 ruling of the Ninth Circuit Court of Appeals. Our findings show that reduced legal deterrence will increase corporate default risk, revealing the bright side of shareholder litigation. More importantly, our research provides new insights into legal reforms. Since frivolous lawsuits increase the waste of the firm's assets and time, policymakers have implemented a series of legal reforms, such as the Fairness in Class Action Litigation Act of 2017 and the Lawsuit Abuse Reduction Act of 2017, to mitigate the adverse impacts of frivolous lawsuits on firm operations. However, we argue that the curbed litigation rights have a more detrimental impact on the firm compared to the abuse of meritless litigation. That is, the firm is expected to go bankrupt in the lax litigation environment. Hence, it has significant implications for shareholder litigation reform.

Second, our research contributes to the literature on the determinants of corporate default risk. Our study is related to but different from Arena (2018), who examines whether and how litigation risk affects credit risk. Empirically, the measures of credit risk from Arena (2018) are credit ratings. However, many firms do not have credit ratings and credit ratings are not continuous, so their findings may suffer from selection biases. Our study uses the structural distance-to-default model developed by Bharath and Shumway (2008) to continuously measure firm default risk, which covers different types of public firms. Thus, our results may have greater generalizability to the study on the effects of shareholder litigation on default risk. In addition, they mainly rely on actual security class action lawsuits to estimate litigation risk, which is susceptible to endogeneity concerns. They discuss that higher litigation risk is associated with higher credit risk for firms. However, by using the UD laws setting, we have the opposite findings that litigation risk has a negative relation with expected default probability, suggesting that the expected benefits of shareholder litigation as a governance tool may outweigh the incurred costs of lawsuits. Prior studies document that corporate default risk can be explained by stock liquidity (Brogaard, Li, and Xia, 2017), innovation performance (Hsu et al., 2015), options trading (Yang and Luo, 2023), short selling (Meng et al., 2023), board co-option (Baghdadi, Nguyen, and Podolski, 2020), takeovers threat (Balachandran et al., 2023), and financial statement comparability

(Wang et al., 2024). Most of these studies highlight the importance of governance mechanisms in determining default probability. Our study provides new empirical evidence that shareholder litigation in the form of external governance mechanisms affects expected corporate default risk, which complements this stream of literature.

The remainder of this paper is organized as follows. Section 2 introduces the institutional background of derivative lawsuits and securities litigation. Section 3 reviews related literature and develops the hypotheses. Section 4 describes sample construction and variable selection. Section 5 presents summary statistics, empirical models, baseline regression results, endogeneity tests and robustness checks. Section 6 provides additional analyses. Section 7 reports channel tests. Section 8 concludes the paper.

2. Institutional background

The U.S. corporate law grants shareholders two forms of litigation rights to protect their interests: derivate lawsuits or securities class action lawsuits. Derivative lawsuits are brought by shareholders on behalf of the company against directors and officers for their alleged breach of fiduciary duties including the duty of loyalty and the duty of care. Commonly, derivative lawsuits are rarely settled with monetary compensation. Even if there is such cash settlement, it will directly go to the corporation treasury and shareholders do not get any financial recovery from them. Hence, the primary aim of derivative lawsuits is to promote corporate governance reform. To initiate a derivative lawsuit, shareholders are obligated to first submit a formal demand to the board of directors, requesting them to take legal action against the wrongdoers. The demand requirement allows the board of directors to decide whether the lawsuit will proceed for the firm. In most cases, the boards are hardly likely to accept the demand because these lawsuits usually involve their board members as defendants. As such, due to the board's demand refusal, the derivative lawsuit is most likely to be dismissed by the court following the business judgment rule. However, to prevent directors from unjustly obstructing a derivative lawsuit, the court alternatively provides shareholders with the futility exception to demand requirements, which allows shareholders to circumvent the demand procedure and directly commence a derivate lawsuit in the court without making a demand to the boards by claiming that the boards that engage in the alleged misconduct lack impartiality in making their judgment. However, the existence of demand futility causes the misuse of derivative litigation rights, resulting in a negative impact on the efficiency of the legal system. To mitigate the detrimental consequences of futility exception, the American Bar Association introduces the concept of "Universal Demand" (UD) in the Model Business Corporation Act (MBCA). Under

MBCA, the UD removes the demand futility and mandates that shareholders place a demand in each derivative case. From 1989 to 2005, 23 U.S. states have enacted the UD laws, increasing the challenges of launching derivative proceedings for shareholders. Consequently, there is a significant decline in the number of derivative suits filed in states that have passed the UD laws (Appel, 2019).

As opposed to indirect derivative lawsuits, a security class action litigation is a direct lawsuit filed by the class of shareholders on behalf of themselves, instead of on behalf of the corporation, to deal with the firm's managerial misconduct resulting in direct financial loss to its shareholders who participate in stock trading. Unlike in a derivation action, only the plaintiff class of shareholders directly receive all financial rewards from a class action lawsuit. Similarly, the other important legal reforms that curb frivolous lawsuits also set higher standards to commence a security class action lawsuit. In 1995, the U.S. Congress implemented the Private Securities Reform Act (PSLRA), which established regulations that are specifically applicable to securities class actions. According to PSLRA, to legally form a class, plaintiffs are required to meet specified criteria that lead to "strong inference" that the defendants acted with "the required state of mind" for fraud (Houston et al., 2019). Although the PSLRA has made contribution towards reducing litigation for all companies, the pleading standards are subject to different interpretations by U.S. circuit courts. In particular, on July 2, 1999, the Ninth Circuit Court of Appeals issued a ruling in the *In Re: Silicon Graphics Inc. Securities Litigation* case, which provided the most stringent interpretation of the pleading standard. The Ninth Circuit ruling requires plaintiffs to demonstrate that the defendant engaged in actions defined as "deliberate recklessness" before forming a class. In other circuits, the demonstration of "mere recklessness" is sufficient. The 1999 ruling makes it more difficult for plaintiff shareholders to initiate a security class action lawsuit, which significantly reduces security risk for companies headquartered in the Ninth Circuit states. Crane and Koch (2018) indicate that the number of class action litigation declined by 43% in the Ninth Circuit following the ruling, while it increased by 14% in the other Circuits.

3. Literature review and hypotheses development

3.1 The literature on UD laws

A growing body of literature has discussed the various impacts of the adoption of UD laws on corporate outcomes. On the one hand, it directly deteriorates the firm's corporate governance quality. Because the UD laws significantly reduce the legal deterrence to discipline managers as governance mechanisms, managers find it easier to be entrenched themselves, which exacerbates agency problems. Appel (2019) shows

that the adoption of UD laws is positively related to corporate governance provisions that entrench managers, including poison pills, super-majority voting requirements and classified boards. Foroughi et al. (2022) find that management-friendly governance provisions propagate from a firm affected by the UD laws to other firms not affected by the UD laws through the interlocking director network. Since the adoption of UD laws increases management entrenchment, the cost of external financing becomes higher to offset the increased monitoring costs and risk taking. Thus, the adoption of UD laws results in an increase in the cost of debt (Ni and Yin, 2018) and an increase in the cost of equity (Houston, Lin, and Xie, 2018). In line with severe agency conflicts, Li, Monroe, and Coulton (2023) find that the adoption of UD laws significantly decreases investment efficiency. Similarly, Chen, Li, and Xu (2021) indicate that the UD laws discourage directors from carrying out monitoring roles through derivative lawsuits, thereby lowering the boards' monitoring demand for accounting conservatism. In addition, entrenched managers are prone to expropriate wealth from the firm in the opaque information environment. Following the adoption of UD laws, managers are shielded more effectively from shareholder lawsuits for their extraction of private benefits, which consequently reduces the quality of corporate disclosure and worsens information asymmetry (Houston, Lin, and Xie, 2018; Boone, Fich, and Griffin, 2023).

On the other hand, the adoption of UD laws mitigates the deterrence effects of litigation rights on managerial decision-making and risk-taking, which may contribute to firm value-creation in the long term. Nguyen, Phan, and Lee (2020) find the enactment of UD laws is positively associated with higher firm financial leverage that enhances firm value. Lin, Liu, and Manso (2021) find that the reduction in litigation risk after the enactment of UD laws motivates officers and directors to engage in far-insighted innovation. Nguyen, Phan, and Sun (2018) find that the UD laws induces the firm to invest more in value-enhancing but risk-increasing projects by reducing precautionary cash holdings. Chu and Zhao (2021) indicate that decreased litigation threat arising from UD laws triggers more valuable mergers and acquisitions (M&A). Bourveau, Lou, and Wang (2018) discuss the various impacts of litigation risk on corporate disclosure and they find that the lower litigation risk due to UD laws increases the frequency of voluntary disclosure. Overall, existing studies provide mixed evidence on whether the firm benefits from the passage of UD laws.

3.2 The literature on corporate default risk

Previous studies rely on credit spread or credit rating to estimate credit risk (Ashbaugh-Skaife, Collins, and LaFond, 2006; Tang and Yan, 2010; Kim, Kraft, and Ryan, 2013; Attig et al., 2013; Bonsall, Holzman, and Miller, 2017; Cornaggia, Krishnan, and Wang,

2017; Bao et al., 2024). Different from these studies, another stream of literature focuses on structural models to measure the expected default risk. Merton (1974) developed a structural default-to-distance model to measure default risk. Bharath and Shumway (2008) further proposed the expected default frequency (EDF) model to improve the prediction accuracy of the Merton model and simplify its calculation methods. The EDF model enables us to continuously estimate and monitor firm defaults, making it possible to investigate default risk in a timely manner (Wang et al., 2024). Moreover, the EDF model is derived non-parametrically from the distance-to-default model, ensuring robustness to model misspecification (Berndt et al., 2018).

A large volume of literature has emerged in the field of corporate default following the use of structural default models. Hsu et al. (2015) examine whether firm innovation performance determines its creditworthiness and they find that highly innovative firms are more likely to experience a lower default probability. Brogaard, Li, and Xia (2017) investigate the effects of stock liquidity on the firm default risk and they find that higher stock liquidity, making it easier for investors to exit, is associated with lower firm bankruptcy risk. Baghdadi, Nguyen, and Podolski (2020) examine the negative impacts of board composition on the firm default risk. Their findings show that co-opted boards trigger more erratic decision-making, leading to higher default risk. Balachandran et al. (2023) find a negative relation between the threat of takeovers and the expected default frequency, suggesting that the threat of takeover serves as an important external governance mechanism to discipline managers, contributing to the reduction in default risk. Yang and Luo (2023) examine whether and how firm default risk is higher in an active options market. They indicate that options trading increase corporate default risk by offering excessive risk-shifting incentives. Wang et al. (2024) show a negative relation between financial statement comparability and expected default frequency. Their results imply that financial statement comparability effectively reduces corporate expected default risk through the channels of enhanced information environment and increased external monitoring. Overall, these studies highlight the crucial role of internal and external governance mechanisms in mitigating default risk. However, as discussed above, shareholder litigation rights also act as an important external governance tool to affect corporate policy, but few studies examine the effects of shareholder litigation rights on firm default. Therefore, our study attempts to fill this gap.

3.3 Hypotheses development

Legal protection significantly contributes to resolving agency problems stemming from the separation of ownership and control (La Porta et al., 1998). In particular, shareholder

litigation rights are a vital part of the legal system that regulates U.S. firms to protect minority shareholders' interests. Legally, officers and directors owe fiduciary duties to the firm and their shareholders, which help ensure that managers act in the best interests of shareholders. When managers are prioritizing their personal interests over those of shareholders, shareholders have the right to file a derivative lawsuit for their breach of fiduciary duties, thereby holding management accountable for their misconduct. Derivative lawsuits are typically related to the significant improvement in corporate governance structures and practices (Romano, 1991; Ferris et al., 2007; Erickson, 2009). However, shareholder litigation imposes substantial direct pecuniary costs and non-pecuniary costs on the firm, especially when shareholders can abuse derivative lawsuits. Excessive legal exposure may cause managerial myopia problems, which deters managers from pursuing risky but value-increasing corporate policy and ultimately damages firm performance.

In light of this, 23 U.S. states have adopted UD laws to raise procedural hurdles for shareholders initiating derivative lawsuits. Although the passage of UD laws significantly pushed down the misuse of derivative lawsuits, it will have adverse impacts on corporate governance. The UD laws deteriorate the governance power of litigation rights to discipline managers, thereby exacerbating agency conflicts between managers and shareholders. Some studies document that the UD laws trigger more governance provisions that increase management entrenchment (Appel, 2019; Foroughi et al., 2022). Entrenched managers have more incentives to serve their own interests rather than those of shareholders, thereby worsening self-dealing and moral hazard problems. The shareholders' rights to sue management function as a governance tool to deter managers from involving in wrongdoings in the future. The UD laws significantly reduce the expected likelihood of derivative suits and consequently weaken the deterrence function of derivative litigation. The reduced legal deterrence in return induces managers to engage in self-serving and opportunistic behaviours, including shirking responsibility, excessive managerial compensation, consumption of perquisites and empire-building, which leads to higher agency risk to the shareholders. As a result, the firm is expected to experience higher default risk since the increased agency risk decreases the expected value of the cash flows to the firms (Ashbaugh-Skaife, Collins, and LaFond, 2006). Likewise, Reduced legal deterrence relieves managers' career concerns and encourages management to invest in risk-increasing projects. Excessive risk-taking of the underlying firm increases the cash flow volatility, resulting in a higher default probability.

Furthermore, the increase in management entrenchment following the adoption of UD laws is associated with a higher cost of external financing. The UD laws weaken

shareholder oversight by raising a significant obstacle to derivative litigation. Outside investors may seek a higher rate of return to offset the increased monitoring cost associated with greater expropriation risk, which leads to a higher cost of equity financing (Houston, Lin, and Xie, 2018). Similarly, the cost of debt increases after the adoption of UD laws through the channel of managerial risk-taking (Ni and Yin, 2018). The over-reliance on costly external financing will increase financial distress risk, particularly for higher debt financing. Nguyen, Phan, and Lee (2020) document that the company tends to increase debt financing as a substitute for external discipline mechanisms to offset curbed shareholder litigation rights after the adoption of UD laws. However, in the context of the high cost of external financing, the increase in financial leverage is more susceptible to subject firms to greater insolvency risk if firms are unable to fulfil their financial obligations, which potentially causes firms to declare bankruptcy. Following these arguments, we predict that the adoption of UD laws is positively related to firm bankruptcy risk. Thus, our first hypothesis is stated as follows:

H1. a: The adoption of UD laws leads to an increase in corporate default risk.

The cost of shareholder lawsuits is so enormous that the firm cannot rely entirely on them to address agency problems. Even worse, the costly legal proceedings will have a direct and negative impact on firm profitability and value. Commonly, shareholder lawsuits incur substantial pecuniary costs for cash settlement and attorney fees. Arena and Julio (2023) document that the average legal expense for setting corporate lawsuits is $61 million in their sample. Nevertheless, the primary beneficiaries of lawsuits could not be the plaintiff shareholders but their lawyers, who obtain a substantial portion of financial recovery (Romano, 1991). In that case, in order to win great attorney fees in the settlement, self-interested attorneys encourage shareholders to file more frivolous lawsuits that are not intended to introduce corporate governance reform. Instead, these meritless lawsuits waste the firm's resources and undermine the governance effectiveness of litigation rights. Besides the direct monetary costs, shareholder lawsuits also impose indirect and non-pecuniary costs on firms and managers. These indirect costs may have more serious implications for firm creditworthiness and exacerbate lenders' assessment of firm default. For example, such costs increase uncertainty about firms' prospects, harm firms' reputations, cause an interruption in the supply chain, and distract managers' attention. Although firms can choose to purchase director and officer (D&O) liability insurance that covers legal fees in settlements, its coverage does not fully protect directors and officers from the outcomes of shareholder lawsuits. First, the coverage of D&O insurance is not allowed to extend to some wrongdoers who involve dishonesty and intentional misconduct. Second, it is completely ineffective in rehabilitating firms' and managers' reputational loss in suits even if lawsuit settlements are fully covered by D&O insurance. Finally, the increase

in insurance premiums following the suits also poses a great financial burden on the firm. If firms are exposed to higher litigation risk, debtholders tend to seek a higher interest rate to mitigate the negative consequences of litigation risk and credit rating agencies will factor litigation risk into the credit evaluation model, which leads to a decrease in credit rating and an increase in the cost of debt (Arena, 2018). Thus, litigation risk will have a positive impact on firm credit risk.

In addition, although shareholder litigation deters managers from potential misconduct, legal deterrence raises managers' career concerns and causes managerial myopia problems, which encourages them to implement risk aversion and conservative policies that reduce their exposure to litigation risk. Lin, Liu, and Manso (2021) indicate that shareholder derivative litigation hinders corporate innovation. Nguyen, Phan, and Sun (2018) argue that firms exposed to litigation risk increase precautionary cash savings against legal expenses and settlement in future suits. On the contrary, Managers choose to pursue value-enhancing and risk projects that may have a positive effect on firm performance, which, in return, lowers firm default risk. Hsu et al. (2015) find that firms with high innovation performance are expected to have lower default probabilities. Taken together, these arguments suggest that litigation costs and its deterrence effects potentially increase firm bankruptcy risk. Since the adoption of UD laws significantly reduces litigation risk and weakens legal deterrence, we expect that corporate default risk will decrease following the adoption of UD laws. Thus, we state our alternative hypothesis as follows:

H1. b: The adoption of UD laws leads to a decrease in corporate default risk.

Two opposing views about the effects of UD laws on corporate default risk suggest that the relation between shareholder litigation rights and corporate default risk is an empirical question.

4. Sample and variable description

4.1 Sample selection

Our main sample includes 33,173 firm-year observations of 5,900 U.S. public firms during the period from 1993 to 2010. Whether the UD laws are effective for the firm depends on the firm's historical state of incorporation. Our sample construction starts in 1993 since the data on the firm's historical state of incorporation is reliably available on the U.S Securities and Exchange Commission (SEC) Edgar electronic filings from the year 1993.[1] If the firm's historical state of incorporation is missing in the dataset,

[1] The historical state of incorporation data is obtained from Bill McDonald's website.

we complement it by using the current state of incorporation from Compustat. We exclude firms classified in utility industries (SIC 4900-4999) and financial industries (SIC 6000-6999) since these industries are highly regulated. Lastly, we winsorize all continuous variables at the top and bottom 1% of the sample distribution to mitigate the influence of outliers.

We obtain firm data from Compustat and stock data from CRSP. We collect institutional ownership data from the Thomson-Reuters Institutional Holdings database. The data on independent board data are obtained from the Institutional Shareholder Service (ISS) database. The data on state-level economic data is from the University of Kentucky Center for Poverty Research (UKCPR).

4.2 Measure of default risk

We construct expected default frequency (EDF) to proxy firm-level default risk. The EDF is calculated based on a simplified version of the Merton structural distance-to-default model, developed by Bharath and Shumway (2008). Specifically, corporate default risk (EDF) is measured as follows:

$$DD_{i,t} = \frac{log\left(\frac{Equity_{i,t} + Debt_{i,t}}{Debt_{i,t}}\right) + \left(r_{i,t-1} - 0.5\sigma_{Vi,t}^2\right) \times T_{i,t}}{\sigma_{Vi,t} \times \sqrt{T_{i,t}}}$$

$$\sigma_{Vi,t} = \frac{Equity_{i,t}}{Equity_{i,t} + Debt_{i,t}} \times \sigma_{Ei,t} + \frac{Debt_{i,t}}{Equity_{i,t} + Debt_{i,t}} \times \left(0.05 + 0.25 \times \sigma_{Ei,t}\right)$$

and

$$EDF_{i,t} = N(-DD_{i,t})$$

Where $Equity_{i,t}$ is the market value of equity computed by the number of shares outstanding times the year-end stock price; $Debt_{i,t}$ is the face value of debt calculated as the sum of current liabilities and one-half of long-term debt; $r_{i,t-1}$ is firm i's past annual return, calculated from monthly stock return over the previous year $t-1$; $\sigma_{Ei,t}$ represents annualized stock return volatility for firm i during the year t, estimated using the monthly stock return from the previous year $t-1$; $\sigma_{Vi,t}$ is an approximation of the volatility of firm assets; $T_{i,t}$ is set to one year; $N(.)$ is the cumulative standard normal distribution function.

4.3 UD laws adoption

The UD laws require shareholders to make a demand on the board of directors before filing a derivative lawsuit, which raises a procedural hurdle to pursue a derivative lawsuit, thereby reducing litigation risk. In particular, demand requirements depend on the firm's state of incorporation, irrespective of whether the derivative lawsuit is initiated in a state or federal court (Bourveau, Lou, and Wang, 2018). Thus, we use the firm's state of incorporation to determine whether the firm is affected by UD laws. 23 U.S. states have adopted UD laws from 1989 to 2005.[2] Specifically, the first states that passed UD laws are Georgia and Michigan in 1989, while the last UD law adoption took place in Rhode Island and South Dakota in 2005. Since the UD laws variable is constructed starting from 1993, we restrict the firm's state of incorporation to the last 14 adopting states, which include North Carolina, Arizona, Nebraska, Connecticut, Maine, Pennsylvania, Texas, Wyoming, Idaho, Hawaii, Iowa, Massachusetts, Rhode Island, and South Dakota.

4.4 Control variables

Following Bharath and Shumway (2008), we control for five key factors affecting the level of firm default risk: the natural log of market value of equity (*Lnequity*), the natural log of face value of debt (*Lndebt*), the inverse of annualized stock return volatility (*Volatility*), the ratio of net income to total assets (*ROA*) and the difference between the stock's annual return and CRSP value-weighted return (*Excess return*). Following Hsu et al. (2015), we include the ratio of the book value of equity to the market value of equity (*Bookmarket*) as a proxy for the firm's growth opportunities. Since growth firms are more likely to secure external financing, we therefore expect a positive relation between between book-to-market ratio and default risk. Following Ashbaugh-Skaife, Collins, and LaFond (2006), Brogaard, Li, and Xia (2017), Baghdadi, Nguyen, and Podolski (2020), we also control for corporate governance proxied by institutional ownership and independent board. *Independent* is the ratio of independent directors on the board. *Instown* is the average percentage of shares outstanding owned by institutional investors. To capture the possible effects of macroeconomic factors on the firm default risk, we additionally control for state-level GDP growth rate (*GDP growth*) and the natural log of a state GDP per capita (*Log GDP capita*). Appendix B provides the detailed definitions of all variables.

5. UD laws and corporate default risk

In this section, we present the regression results of the effects of UD laws adoption on corporate default risk. We first present the validity test of our identification strategy.

[2] Appendix A provides the list of years and states that adopted UD laws.

Then, following the difference-in-differences (DID) approach, we present ordinary least squares (OLS) regression results for the impacts of the staggered adoption of UD laws on default risk. Once we identify the relation between UD laws and default risk, we conduct a battery of tests to validate our baseline DID regression results.

5.1 Summary statistics

Panel A in Table 1 presents the summary statistics for our overall sample from 1993 to 2010. The mean of *EDF* is 0.063 and ranges from 0 to 1. *UD Law* has a mean of 0.049, implying that the adoption of UD laws affects 4.9% of firm-year observations. Panel B in Table 1 reports the summary statistics for the subsample. We divide the sample into two main groups. "UD laws adopting states" and "Non-UD laws adopting states". Specifically, we compare the mean difference between pre-UD laws adoption and post-UD laws adoption for firms incorporated in the UD laws states. The difference tests show that the mean of *EDF* is 0.038 in the pre-UD laws adoption period, and it is 0.070 after the adoption of UD laws, suggesting that the value of *EDF* significantly increases following the passage of UD laws.

[Insert Table 1 Here]

5.2 Validity tests of UD laws adoption

Before exploring the association between UD laws adoption and corporate default risk, we first conduct validity tests for the natural experiment to rule out the possibility of reverse causality. The relation between shareholder litigation and default risk could go both ways. That is, shareholder litigation could affect the default risk as suggested above, while default risk could reversely affect litigation risk. The firm is prone to be the target of shareholder lawsuits as it approaches bankruptcy. In that case, the firm is more likely to lobby state legislatures for the adoption of UD laws to reduce litigation costs incurred by corporate default.

To examine whether corporate default risk affects the passage of UD Laws, we employ a probit model in which the dependent variable is the UD law indicator that equals one if the state has adopted UD law in a given year and zero otherwise. We aggregate the sample at the level of state of incorporation and year. The explanatory variable is the average *EDF* for firms incorporated in a state in year $t-1$. We also control for a set of state-level factors that affect the regional economy, including state GDP, state GDP growth rate and state GDP per capita. Panel A of Table 2 reports that the preexisting *EDF* is not significantly related to the probability of states adopting UD laws, suggesting that firm default risk is unlikely to determine the adoption of UD law in a

state.

In addition, the adoption of UD laws may change firms' state of incorporation to better reduce their exposure to litigation risk since the UD laws adopting states have a lower incidence of derivative lawsuits than non-UD laws adopting states. To address this concern, we conduct an empirical analysis to examine whether the adoption of UD laws causes "incorporation state shopping". Panel B of Table 2 shows that the number of firms incorporated in a state does not significantly change following the adoption of UD laws, suggesting that firms do not choose to incorporate in a state with UD laws. Overall, the results reported in Table 2 confirm the validity of our empirical setting.

[Insert Table 2 Here]

5.3 Baseline results

We employ the difference-in-differences (DID) approach to examine the effects of UD laws on corporate default risk measured by expected default frequency (*EDF*). This approach compares changes in the EDF among firms incorporated in states that adopt UD laws (treatment group) with changes in the EDF among firms incorporated in states that do not adopt the law (control group). Our baseline EDF regression model is motivated by the burgeoning literature on the structural default model (e.g., Bharath and Shumway, 2008; Brogaard, Li, and Xia, 2017; Baghdadi, Nguyen, and Podolski, 2020; Balachandran et al., 2023) and has the following form:

$$EDF_{ist} = \beta_0 + \beta_1 UDlaw_{st} + \gamma X_{ist} + Fixed\ effects + \varepsilon_{ist}$$

Where EDF_{ist} is expected default frequency of firm i incorporated in state s in year t. $UDlaw_{ist}$ is an indicator that takes the value of one if firm i incorporated in state s that has adopted UD laws in year t and zero otherwise. We control for a set of variables X_{ist} document in the literature on the determinants of firm default risk, including the market value of equity, the book value of debt, the inverse of the annualized standard deviation of stock return, annual excess stock return, return on assets, book-to-market value, independent board, institutional ownership. We also control for state-level factors to capture the effects of macroeconomic characteristics on default risk, including state GDP growth rate and state GDP per capita. Since EDF could be affected by unobserved firm characteristics and time-varying macroeconomic conditions, we additionally include firm, year and state-fixed effects in the regressions. We cluster standard errors at the level of state of incorporation to control for potential time-varying correlations in observed factors that affect various companies within the same state (Ni and Yin, 2018). Appendix B provides detailed variable definitions.

Table 3 presents the results of the effects of UD laws on default risk. In columns 1-3, we perform the contemporaneous EDF regression. Specifically, in Column 1, we include *Lnequity*, *Lndebt*, *Volatility*, *ROA*, and *Excess return* as control variables, which are direct determinants of default risk in Bharath and Shumway (2008), as well as firm and year fixed effects. In Column 2, we additionally control for *Bookmarket*, *Independent*, *Instown* and state-fixed effects. In column 3, to further eliminate unobserved factors bias, we remove the state-fixed effects from the regression but replace them with state economic conditions that may be correlated with both UD laws adoption and *EDF*, including *GDP growth* and *Log GDP per capita*. The results indicate that the estimated coefficients of *UD Law* are positive and statistically significant at the level of 1% for all three specifications, suggesting that firms in the treatment group tend to increase default risk following the passage of UD laws, relative to firms from the control group. The economic effect of UD law adoption on corporate default risk is also meaningful. The estimated coefficient of *UD Law* indicates that holding other variables unchanged at their sample means, the adoption of UD laws is associated with an increase of 0.023 to 0.024 in the value of *EDF*, which is equivalent to 36.51%-38.10% of its sample mean.

To further address reverse causality concerns, we lead the dependent variable by one year and the sample period for *EDF_lead* will be updated to 1994-2011. Columns 4-6 of Table 3 report the results of leading EDF regression. We still find a positive and statistically significant relation between UD laws adoption and corporate default risk, which is consistent with the results of the contemporaneous EDF regression. In terms of economic significance, the coefficient estimates of *UD Law* indicate that the passage of UD laws increases the value of *EDF* by 0.021-0.023, which is equivalent to 33.33%-36.51% of its sample mean. Overall, the results reported in Table 3 support the argument that the adoption of UD laws leads to an increase in corporate default risk.

For the control variables, we find similar results to those documented in previous literature (Bharath and Shumway, 2008; Brogaard, Li, and Xia, 2017). We find that *EDF* is positively and significantly related to *Lndebt*, but *EDF* is negatively and significantly related to *Lnequity*, *Volatility*, *ROA*, and *Excess return*. In line with Hsu et al., 2015, we also find a positive and significant relation between *EDF* and *Bookmarket*, implying that default risk is lower for growth firms.

[Inset Table 3 Here]

5.4 Dynamic Models

Our DID results so far present a positive and significant relation between UD laws and default risk. The DID result holds if the change in the value of *EDF* is driven by the exogenous variation in litigation risk following the adoption of UD laws rather than an ex-ante increase in the EDF. In other words, in the absence of treatment, which is the UD laws adoption, the change in the value of EDF between the treatment group and the control group should follow parallel trends over time. However, the pre-treatment trends could be valid if both EDF and UD laws adoption simply follow time trends. In that case, the positive relation between the two may be spurious. To mitigate this concern, we employ a dynamic EDF model to observe whether UD laws are positively and significantly related to EDF before the adoption of UD laws:

$$EDF_{ist} = \beta_0 + \beta_1 UDlaw_{st}^{-2} + \beta_2 UDlaw_{st}^{-1} + \beta_3 UDlaw_{st}^{0} + \beta_4 UDlaw_{st}^{+1} + \beta_5 UDlaw_{st}^{\geq+2} + \gamma X_{ist} + Fixed\ effects + \varepsilon_{ist}$$

Where the dependent variable is either *EDF* or *EDF_lead*. Control variables and fixed effects are similar to those reported in the baseline DID model. We set the five indicator variables $UDlaw_{st}^{-2}$, $UDlaw_{st}^{-1}$, $UDlaw_{st}^{0}$, $UDlaw_{st}^{+1}$, and $UDlaw_{st}^{\geq+2}$ to one if the firm is incorporated in a state that will pass the UD law next two years, will pass the law next one year, pass the law this year, passed the law one year ago, and passed the law two and more year ago respectively.

Columns 1-3 (Column 4-6) of Table 4 present the estimation results of the dynamic *EDF* (*EDF_lead*) model. In Columns 1-3, we find that the coefficients of $UDlaw_{st}^{-2}$, $UDlaw_{st}^{-1}$, $UDlaw_{st}^{0}$, and $UDlaw_{st}^{+1}$ are statistically insignificant while the coefficient of $UDlaw_{st}^{\geq+2}$ is positively significant. In Columns 4-6, we also find that the coefficients of $UDlaw_{st}^{-2}$, $UDlaw_{st}^{-1}$, and $UDlaw_{st}^{0}$ are statistically insignificant while the coefficient of $UDlaw_{st}^{+1}$ and $UDlaw_{st}^{\geq+2}$ are all positive and significant. These results show that corporate default risk increases only after the adoption of UD laws but not before, indicating the observed relation is driven by UD laws adoption rather than time trends. This evidence further supports the parallel trends assumption.

[Insert Table 4 Here]

5.5 Propensity score matching (PSM) analysis

It is also possible that the positive and significant relation between UD laws and firm default risk could be driven by omitted variables that are related to both the enactment of UD laws and the increase in the default risk. For instance, firms incorporated in states that have adopted UD laws (treated firms) are systematically different from firms incorporated in states that have not adopted UD laws (control firms). The systematic

differences between treated firms and control firms could drive our baseline results. To overcome this problem, we further conduct a propensity score matching (PSM) analysis to explore the effects of UD laws on corporate default risk.

We first use a PSM method to construct a sample consisting of treated firms and control firms that share similar characteristics. Specifically, we classify firms that are incorporated in states that have (have not) adopted UD laws as treated firms (control firms). We then use a logit model to calculate the propensity score of a firm being a treatment based on a list of covariates that significantly affect EDF in our baseline model, including the market value of equity, face value of debt, stock return volatility, ROA, excess stock return, book-to-market. Next, we match each observation in the treatment group with the most comparable observation in the control group by using the one-to-one nearest neighbour propensity scores matching without replacement, within a caliper of 0.05.

Panel A of Table 5 presents a comparison between treated firms and control firms before and after matching. The statistics indicate that there are significant mean differences in *Lndebt*, *Volatility*, *ROA*, *Bookmarket* between treated firms and control firms before the matching, but we find insignificant mean differences in all matched variables between the two groups after the matching, suggesting that treated firms are well matched with control firms in all quantifiable aspects. Since our PSM procedure is successful, we rerun the EDF regression model using the propensity score matched sample. Panel B of Table 5 reports the regression results for the PSM sample. The coefficient of *UD Law* is still positive and statistically significant at the level of 5%, which is qualitatively similar to the main findings. In terms of significance, the adoption of UD laws increases the value of *EDF* by 0.055. The PSM results indicate that the increase in corporate default risk following the passage of UD laws is not driven by observed differences in firm characteristics.

[Insert Table 5 Here]

5.6 Entropy balancing

Next, we employ an entropy balancing approach to mitigate confounding bias due to systematic differences between treatment groups and control groups. Entropy balancing assigns different and continuous weights to the control group, ensuring that their covariates (e.g., matching mean, variance and possibly higher-order moments) match those in the treatment group. Similarly, both entropy balancing and PSM balance the distributions of covariates to make treatment and control groups comparable in

observable aspects. However, compared to PSM, entropy balancing is a one-step process and provides more precise and flexible covariate balances. Besides, it is less susceptible to model misspecification bias.

Following Hainmueller (2012), we use the entropy balancing approach to match the similar covariates to those reported in Table 5 between treated firms and control firms. We ensure that the first three moments of covariates are balanced, including mean, variance and skewness. The results in Panel A of Table 6 present significant differences between treated firms and control firms before entropy balancing but there is no difference between the two groups after entropy balancing. We then rerun the baseline DID regression model using entropy balancing sample. The results reported in Panel B of Table 6 show that the adoption of UD laws increases EDF by 0.025, which further supports our earlier findings.

[Insert Table 6 Here]

5.7 Robustness checks

We conduct a battery of additional tests to check the robustness of our baseline results. First, our results could be confounded by the state adoption of other laws and regulations during the sample period, such as the Business Combination laws (BC laws) and Poison Pill legislation (PP laws). BC and PP laws are the common types of antitakeover laws that can affect the threat of takeover, which in turn affects corporate default risk. To control for possible confounding effects of these laws, we rerun the EDF regression model while including indicator variables for these two laws. We define BC laws (PP laws) as an indicator variable that equals one if the state that the firm incorporated in has passed BC laws (PP laws). The result reported in Column 2 of Table 7 indicates that the coefficient of *UD Law* remains positive and significant at the level of 1%, suggesting that our findings are robust to controlling for confounding anti-takeover law changes. Our second check aims to mitigate the concern that the observed positive relation between UD laws and default risk is driven by the Delaware effect. Due to corporate-friendly laws and tax structure, a large number of firms choose to incorporate in Delaware, which might bias estimation results in our baseline model. Thus, we exclude firms incorporated in Delaware from our sample and rerun the EDF regression model. The results reported in Column 2 of Table 7 indicate that the coefficient of *UD law* is positive and statistically significant at the level of 5%, suggesting that our finding is not sensitive to controlling for the Delaware effect. Next, we run another robustness check by examining whether the effects of UD laws on default risk are driven by corporate lobbying. As stated earlier, firms can lobby state

legislatures for the enactment of UD laws, which raises concerns about the exogeneity of the UD laws adoption. Moreover, Islam et al. (2022) find that corporate lobbying is positively related to the reduction in default risk. Notably, in Pennsylvania, the implementation of UD laws depends on the state supreme court, which is less prone to corporate lobbying. Thus, we rerun the EDF regression model using a subsample that restricts treated firms' state of incorporation to those incorporated in Pennsylvania. The estimation results reported in Column 3 of Table 7 indicate that our findings are qualitatively unchanged. Last, a large number of firms may go bankrupt during the crisis periods, potentially confounding the results. Since our sample period overlaps the periods of the dot-com crisis and the global financial crisis, it is possible that the increase in default risk following the passage of UD laws is driven by the two crisis periods. Thus, to explore this possibility, we exclude observations from the crisis periods, including 2001-2002 and 2008-2009. The results reported in Column 4 of Table 7 indicate that our findings persist.

[Insert Table 7 Here]

6. Additional analyses

6.1 Alternative measure of default risk

To ensure that our main findings do not suffer from measurement bias in EDF, we use credit ratings as an alternative proxy for default risk to examine the effects of UD laws adoption on firm default risk. We obtain credit rating data from S&P long-term credit ratings ranging from AAA (highest rating) to D (lowest rating). Following prior literature (Ashbaugh-Skaife, Collins, and LaFond, 2006; Attig et al., 2013; Bonsall, Holzman, and Miller, 2017; Bao et al., 2024), we assign each credit rating a numerical value from 1 (AAA) to 22 (D). The larger numerical values indicate higher default risk.

We present the results of the credit rating regressions in Columns 1-3 of Table 8. We include the same set of control variables as those reported in baseline models, as well as firm, year and state fixed effects. We find that the coefficients of *UD Law* are positive and statistically significant at the level of 1% and 5% across all columns. In terms of economic significance, the adoption of UD laws leads to an increase of 0.624-0.641 in the values of credit ratings. The re-estimation results suggest that our baseline findings are robust to different measures of default risk.

[Insert Table 8 Here]

6.2 Securities litigation and default risk

Alternatively, shareholders may pursue securities class action lawsuits as an important external governance mechanism that disciplines managers to enforce fiduciary duties. We next exploit the 1999 ruling of the Ninth Circuit Court of Appeals in *In re: Silicon Graphics Inc. Securities Litigation* as a quasi-natural experiment to examine the causal relation between securities litigation on corporate default risk. The 1999 ruling heightens the PSLRA pleading standards to initiate securities class action lawsuits by mandating that plaintiff shareholders present the evidence of "deliberate recklessness" instead of "mere recklessness", which is sufficient in other circuits. As a result, the 1999 ruling makes it more difficult for shareholders to file securities class action lawsuits, which subsequently reduces the incidence of such lawsuits. Houston et al. (2019) find that the number of class action lawsuits dropped by 50% more in the Ninth Circuit Court after this ruling compared to other courts of appeals. Firms headquartered in Ninth Circuit states will be exposed to lower securities litigation risk relative to those not. Therefore, the exogenous variation in litigation risk after the 1999 Ninth Circuit ruling provides us with an alternative and valid research setting to examine the effects of shareholder litigation on corporate default risk.

Our treated (control) firms are (are not) those headquartered in the Ninth Circuit states, including Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, and Washington. We also restrict the sample periods to 1994 to 2003, which covers the five years before and after the ruling year. The main explanatory variable, *Ninth Circuit*, is an indicator which takes the value of one if the firm is headquartered in Ninth Circuit states after the 1999 ruling and zero otherwise. We include the same set of control variables as those reported in baseline models, as well as firm, year and state fixed effects. The results reported in Table 9 indicate that the coefficients of *Ninth Circuit* are positive (from 0.012 to 0.014) and statistically significant at the level of 1% across all columns, suggesting that the reduction in securities litigation risk following the 1999 ruling of Ninth Circuit Court of Appeals leads to higher firm default risk.

[Insert Table 9 Here]

6.3 Financial constraints

Firms that are more financially constrained usually have higher default probabilities relative to financially unconstrained firms. When a firm is financially constrained, it will have difficulty generating sufficient internal cash flow and securing external financial resources, thereby possibly failing to meet its debt obligation. Since the reduction in litigation risk following the passage of UD laws drives the firm to increase debt financing and obtain costly external funding, the negative consequence of UD laws

adoption could be more harmful for financially constrained firms. Thus, we expect that the effects of UD laws on default risk are more pronounced for financially constrained firms.

To investigate the difference in the effects of UD laws on default risk between financially constrained firms and financially unconstrained firms, we group firms by their degree of financial constraints. Specifically, we use four different measures of financial constraints, including S&P long-term credit rating (Faulkender and Petersen, 2006), dividend payout (Fazzari, Hubbard, and Petersen, 1987), Whited-Wu (WW) index (Whited and Wu, 2006), and size-age (SA) index (Hadlock and Pierce, 2010). The WW index is defined as $WW\_index = -0.091 * CF - 0.062 * DIVPOS + 0.021 * TLTD - 0.044 * LNTA + 0.102 * ISG - 0.035 * SG$, where CF is the ratio of cash flow to the book value of assets; $DIVPOS$ is a dummy variable that takes the value of one if the firm pays dividend in a given year and zero otherwise; $TLTD$ is the ratio of long-term debt to the book value of assets; $LNTA$ is the natural log transformation of the book value of assets; ISG is the firm's three-digit SIC code industry; SG the firm's annual sales growth. The SA index is defined as $SA\_index = -0.737 * AT + 0.043 * AT^2 - 0.040 * Age$ where AT is the natural log of the book value of assets; Age the number of years the firm has existed in Compustat. Financially constrained (unconstrained) firms are classified as those firms in the above (below) median of the SA index or the WW index, do not pay dividends (pay dividends), or do not have credit ratings (have credit ratings).

Table 10 reports the results of the EDF regression for subgroups of firms sorted on measures of financial constraints. The coefficients of *UD Law* are positive (from 0.022 to 0.030) and statistically significant for financially constrained firms across all four financial constraint measures. However, the coefficients of *UD Law* are insignificant for financially unconstrained firms. These results indicate that the positive relation between UD laws and default risk is more pronounced for financially constrained firms.

[Insert Table 10 Here]

7. Channel analyses

This section explores the underlying channels through which the adoption of UD laws increases corporate default risk. First, we examine whether the adoption of UD laws mitigates the governance effects of shareholder litigation rights, which leads to an increase in management entrenchment and a deterioration in corporate governance mechanisms. Then, we argue that the UD laws reduce legal deterrence of litigation

rights, increasing managerial discretion to make erratic and arbitrary decisions, and leading to higher performance volatility and higher default risk. The erratic decision-making will be a potential channel through which shareholder litigation affects default risk. Thus, we examine the link between UD laws adoption and the decision-making process. Last, the costly external financing increases the firm's insolvency risk, potentially pushing the firm to go bankrupt. Therefore, we also test for the cost of capital as a possible channel to explain the positive effects of UD laws on the increase in the likelihood of default.

7.1 UD laws and corporate governance

First, we examine the effects of UD laws on corporate governance measured by the E-index, G-index and the ratio of the number of directors appointed after the CEO assume office (*Co-option*).[3] The E-index and G-index are common indexes to measure corporate governance (Gompers, Ishii, and Metrick, 2003; Bebchuk, Cohen, and Ferrell, 2009). The increase in either E-index or G-index indicates higher entrenchment. The Co-opted boards are associated with lower board independence. Baghdadi, Nguyen, and Podolski (2020) find that co-opted boards induce managers to make erratic decisions, leading to higher default risk. Thus, if the UD laws worsen corporate governance, we expect a significant increase in the E-index, G-index and Co-option.

Table 11 reports the estimation results. We find the adoption of *UD laws* leads to an increase in both E-index and G-index. Furthermore, we also find that the fraction of Co-opted boards to the total boards increased by 5.4% after the passage of UD laws. These results indicate that management entrenchment increases and corporate governance deteriorates following the passage of UD laws, which is the channel for the weakened litigation rights affecting default risk.

[Insert Table 11 Here]

7.2 UD laws and performance volatility

when the UD laws undermine corporate governance, managers may become increasingly reckless in their decision-making, which contributes to higher volatility of firm performance and higher default risk. Following this argument, we will explore whether the UD laws increase firm performance volatility. We use three proxies to measure firm performance volatility. First, we capture performance volatility by using

[3] The G-index data is available on Andrew Metrick's website, the E-index data is available on Lucian Bebchuk's website and the Co-option data is obtained from Lalitha Naveen's website. The sample period for both G-index and E-index is 1993-2006 and the sample period for Co-option is 1996-2010.

stock return volatility, defined as the standard deviation of daily stock return over the previous year. We also capture performance volatility resulting from corporate profits, measured as the standard deviation of ROA volatility during the past three years. Similarly, following Degl'Innocenti et al. (2019), we further employ an Earnings-At-Risk (*EAR*) estimation to capture performance volatility. The *EAR* measures the worst potential earnings variation a firm may experience within a specific time frame at a given confidence level, which is defined as $EAR = \eta + Z_{\frac{1-\alpha}{2}}\sigma$ where η represents the firm's average profit before tax over the year; σ represents the standard deviation of profit before tax over the year; The higher standard deviation σ indicate that the company face higher potential earnings loss. $Z_{\frac{1-\alpha}{2}}$ represents the critical value from the standard normal distribution of earnings for the α confidence level. The Z-value associated with the confidence level reflects how conservative the risk measure is.

We present our results in Table 12. We include the same set of control variables as those reported in our baseline models, as well as firm and year-fixed effects. In Column 1, we find that the estimated coefficients on the *UD Law* indicator are positive and statistically significant, revealing that the UD laws increase stock return volatility. We also find consistent results for the effects of UD laws on profit volatility in Columns 2 and 3. These results show that the enactment of UD laws increases firm performance volatility, which explains the positive relation between UD laws and firm default risk.

[Insert Table 12 Here]

7.3 UD laws and corporate risk-taking

The results so far show that higher firm performance volatility due to UD laws is the underlying mechanism behind our main findings. Next, we explore what drives the positive association between UD laws and firm performance volatility. Since the UD laws reduce legal deterrence, managers are incentivised to implement risky corporate policies, increasing corporate risk-taking. Thus, we examine whether UD laws induce managers to take on more risk, potentially increasing performance volatility and default risk. Specifically, if the firm assumes more risk following the passage of UD laws, we expect an increase in risky investment, an increase in financial leverage or a decrease in corporate cash holdings.

The results reported in Table 13 show that the coefficients of *UD Law* are insignificant across all columns, suggesting that the UD laws do not cause greater corporate risk-taking through increasing debt levels, pursuing risky projects or reducing corporate

cash reserves. These findings are not consistent with our alternative hypothesis that the enactment of UD laws reduces corporate default risk by encouraging managers to engage in risky corporate policies that enhance firm performance. On the contrary, this evidence is consistent with the managerial quiet life hypothesis that entrenched managers who enjoy a quiet life are willing to make less risky investments (Bertrand and Mullainathan, 2003), which further corroborates the earlier finding that the adoption of UD laws heightens management entrenchment by insulating managers from legal deterrence.

[Insert Table 13 Here]

7.4 UD laws and the decision-making process

Since the UD laws weaken the deterrence effects of shareholder litigation on managers behaviours, the lax litigation environment allows managers to use their discretion in the process of decision-making, which may facilitate more erratic and arbitrary decision-making that leads firms to have more volatile performance and greater default probabilities. Thus, we further examine whether ineffective decision-making is the key driver of the higher performance volatility. To shed light on this possibility, we use strategy conformity to capture less consistent decisions, following the method of Giannetti and Zhao (2019). Specifically, strategy conformity is defined as the sum of the standardized variance between t and $t+4$ of each of the following indicators of corporate policies: (1) advertising intensity (*advertising/sales*), (2) research and development intensity (*R&D/sales*), (3) plant and equipment newness (*net P/E/gross P/E*), (4) nonproduction overhead (*SG&A expenses/sales*), (5) inventory levels (*inventories/sales*), and (6) financial leverage (*debt/equity*). The variance of each indicator is standardized by subtracting the industry mean and dividing by the industry standard deviation, and then calculating the absolute difference between a firm's value and the average value for all firms in the same 2-digit SIC industry. We multiply the absolute differences by minus one to create the indicator of strategy conformity. If managers make decisions more erratic and unpredictable, they are more likely to pursue strategies that conform less to those of their industry peers.

Table 14 presents the estimation results of the effects of UD laws on strategy conformity. We find a significant decline in strategy conformity following the passage of UD laws, suggesting that the adoption of UD laws induces managers to implement strategies that are different from industry norms. Consequently, this finding further supports the argument that both higher default risk and greater performance volatility can be explained by the erratic decision-making process due to UD laws.

[Insert Table 14 Here]

7.5 UD laws and weighted average cost of capital

The high cost of financing can expose the firm to potential insolvency risk, which will cause the firm to go bankrupt in the end. Existing studies show that the adoption of UD laws increases the cost of debt (Ni and Yin, 2018) and increases the cost of equity (Houston, Lin, and Xie, 2018). We, therefore, argue that the cost of capital is another important channel through which the adoption of UD laws increases corporate default risk. To capture both debt financing and equity financing in various proportions, we follow Frank and Shen (2016) and employ the weighted average cost of capital (*WACC*) to measure the overall cost of external financing. The *WACC* is defined as:

$$R_{wacc} = \frac{E}{V} R_E + \frac{D}{V} R_D (1 - T_c)$$

Where E denotes the value of equity; D denotes the value of debt; $V = D + E$, which is the total value of the firm; R_E is the cost of equity from the Fama and French three-factor model; R_D is the average cost of debt; T_c is the corporate average tax rate.

Table 15 presents the results of the effects of UD laws on *WACC*. The results show that the coefficient of *UD Law* is positive and statistically significant. In terms of economic significance, the UD laws are associated with an increase of 0.2% in *WACC*. These findings suggest that the adoption of UD laws increases default risk by increasing the cost of external financing.

[Insert Table 15 Here]

8. Conclusion

A growing body of studies on the determinants of default risk highlights the important role of corporate governance mechanisms in mitigating default risk. However, given that shareholder litigation serves as an external governance mechanism to discipline managers, none of these studies examines the effect of shareholder litigation on corporate default risk. Since actual bankruptcy events are rare and many firms do not have credit ratings, we use expected default frequency (*EDF*) developed by Bharath and Shumway (2008) to measure corporate default risk. This structural default model allows us to explore time-varying default risk for a large sample of companies.

With *EDF* capturing firm default risk, we exploit the staggered adoption of UD laws across 23 U.S. states from 1989 to 2005 as a quasi-natural experiment to examine

whether and how shareholder litigation rights affect firm default risk. Our results indicate that the adoption of UD laws increases corporate default risk. We conduct a battery of tests to check the robustness of our findings, including the validity tests for natural experiments, the parallel trend assumption tests, propensity score matching, and entropy balancing. Our results are also robust to the alternative measure of default risk and insensitive to controlling for corporate governance measures, confounding state-level law changes, corporate lobbying, Delaware effects, and crisis periods. Our findings also can be generalized to securities class action lawsuits. Moreover, the positive association between UD laws and firm default risk is more pronounced for financially constrained firms.

We also examine the underlying channel through which the adoption of UD laws increases corporate default risk. The channel tests suggest that the UD laws enactment deteriorates corporate governance, and induces managers to make erratic and unpredictable decisions, contributing to higher firm performance volatility and ultimately higher corporate default risk. However, we find no evidence that corporate risk-taking increases following the passage of UD laws. Therefore, our evidence indicates that the positive association between UD laws and firm default risk can be attributed to erratic decision-making rather than difficult decision-making, such as risky investments.

Overall, our results reveal the dark side of UD laws, which weaken the governance power of shareholder litigation rights and increase corporate default risk. We provide new evidence that shareholder litigation determines the firm-level bankruptcy risk. We also provide new insights into the debate on the net benefits of shareholder litigation, which has important implications for policymakers to implement legal reforms.

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Table 1. Descriptive statistics

This table presents descriptive statistics for the baseline regression analysis. Panel A presents an overall sample containing 33,173 firm-year observations during the period from 1993 to 2010. Panel B presents the summary statistics for subsamples, including the mean difference between pre-UD laws adoption and post-UD law adoption, and the figures for non-UD adoption states. All variables are winsorised at the 1% and 99% levels.

Panel A: summary statistics for the overall sample						
Variable	Obs	Mean	Min	Median	Max	St.dev.
EDF	33,173	0.063	0.000	0.000	1.000	0.180
UD Law	33,173	0.049	0.000	0.000	1.000	0.216
Lnequity	33,173	5.123	0.851	5.046	10.208	2.056
Lndebt	33,173	2.758	-4.046	2.824	8.219	2.664
Volatility	33,173	2.221	0.592	2.033	4.817	1.033
ROA	33,173	-0.080	-1.707	0.020	0.220	0.302
Excess return	33,173	0.039	-1.026	-0.105	3.866	0.768
Bookmarket	33,173	0.603	-1.818	0.475	3.630	0.689
Independent	33,173	0.144	0.000	0.000	0.900	0.287
Instown	33,173	0.325	0.000	0.234	1.065	0.325
GDP growth	33,173	0.054	-0.036	0.053	0.145	0.031
Log GDP capita	33,173	10.532	10.020	10.536	11.043	0.240
Panel B: summary statistics for subsample						
	UD laws adopting states				Non-UD laws adopting states	
	Pre-UD laws adoption		Post-UD laws adoption			
Variable	Obs	Mean	Obs	Mean	Difference in Mean	Obs	Mean
EDF	1,128	0.038	1,625	0.070	0.032***	30,420	0.063
Lnequity	1,128	4.571	1,625	5.115	0.544***	30,420	5.144
Lndebt	1,128	1.946	1,625	2.905	0.959***	30,420	2.780
Volatility	1,128	2.349	1,625	2.316	-0.033	30,420	2.212
ROA	1,128	-0.034	1,625	-0.039	-0.005	30,420	-0.084
Excess return	1,128	0.030	1,625	0.042	0.012	30,420	0.039
Bookmarket	1,128	0.573	1,625	0.735	0.162***	30,420	0.597
Independent	1,128	0.090	1,625	0.185	0.095***	30,420	0.144
Instown	1,128	0.265	1,625	0.363	0.098***	30,420	0.325
GDP growth	1,128	0.062	1,625	0.054	-0.008***	30,420	0.054
Log GDP capita	1,128	10.373	1,625	10.573	0.200***	30,420	10.536

Table 2. Validity test for UD laws adoption as a quasi-natural experiment

This table presents the results of validity test for the adoption of UD laws as a quasi-natural experiment. The sample is based on the level of state-year of incorporation during the periods from 1993 to 2010. Panel A present the results of the effects of preexisting corporate default risk on the adoption of UD laws using probit model. The dependent variable, *UD Law adoption*, is indicator variable which equals one if the UD laws is effective in a state and zero otherwise. The independent variable is the expected default frequency (*EDF*) aggregated at the level of state incorporation and year. All explanatory variables are lagged by one year. Panel B presents the results of the effects of UD laws adoption on the state of incorporation choices. The dependent variable, *Ln(number)*, is defined as the natural log of the number of firms incorporated in a state each year. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The regression model includes year and state-fixed effects. t-statistics (z-statistics) are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation.

Panel A: UD laws and preexisting default risk		
	(1) UD Law adoption	(2) UD Law adoption
EDF	-1.007	-0.444
	(-0.76)	(-0.38)
Log GDP		-0.282
		(-1.17)
Log GDP capita		1.713
		(1.10)
GDP growth		5.054
		(1.27)
Intercept	-0.324	-11.274
	(-1.35)	(-0.82)
No. of observations	563	563
Pseudo R-squared	0.048	0.079
State FE	No	No
Year FE	Yes	Yes
Panel B: UD laws and incorporation state shopping		
	(1) Ln(number)	(2) Ln(number)
UD Law	-0.046	-0.073
	(-0.46)	(-0.70)
Log GDP		-0.002
		(-0.02)
Log GDP capita		1.303***
		(2.90)
GDP growth		-0.700
		(-0.79)
Intercept	2.210***	-10.895**
	(41.53)	(-2.56)
No. of observations	637	637
Adjusted R-squared	0.447	0.462
State FE	Yes	Yes
Year FE	Yes	Yes

Table 3. UD laws and corporate default risk

This table presents the results from investigating the effects of UD laws adoption on the corporate default risks from 1993 to 2010. The dependent variable is the expected default frequency (*EDF*). We also lead the dependent variable by one year (*EDF_lead*). The sample period for EDF_lead is between 1994 and 2011. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects, year-fixed effects and state-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) EDF	(2) EDF	(3) EDF	(4) EDF_lead	(5) EDF_lead	(6) EDF_lead
UD Law	0.024***	0.023***	0.023***	0.023**	0.021*	0.022**
	(2.76)	(2.71)	(2.74)	(2.24)	(1.94)	(2.14)
Lnequity	-0.086***	-0.085***	-0.084***	-0.044***	-0.037***	-0.037***
	(-42.26)	(-36.75)	(-36.32)	(-28.97)	(-17.45)	(-16.63)
Lndebt	0.023***	0.022***	0.022***	0.015***	0.015***	0.015***
	(19.97)	(18.72)	(18.99)	(22.00)	(21.62)	(22.22)
Volatility	-0.020***	-0.020***	-0.020***	0.003***	0.002**	0.002**
	(-13.20)	(-14.16)	(-14.49)	(2.99)	(2.70)	(2.47)
ROA	-0.024***	-0.026***	-0.027***	-0.055***	-0.064***	-0.065***
	(-4.96)	(-3.99)	(-4.08)	(-11.24)	(-13.64)	(-13.52)
Excess return	0.018***	0.019***	0.019***	-0.042***	-0.040***	-0.040***
	(13.71)	(15.76)	(15.90)	(-25.93)	(-21.69)	(-22.11)
Bookmarket		0.005	0.005		0.024***	0.025***
		(0.78)	(0.83)		(3.53)	(3.59)
Independent		0.005	0.004		-0.007	-0.007
		(0.92)	(0.79)		(-0.89)	(-1.02)
Instown		-0.007	-0.007		-0.003	-0.002
		(-1.46)	(-1.44)		(-0.39)	(-0.31)
GDP growth			-0.106***			-0.063**
			(-2.95)			(-2.22)
Log GDP capita			0.013			0.055***
			(1.21)			(4.58)
Intercept	0.415***	0.445***	0.281**	0.191***	0.171***	-0.410***
	(49.34)	(29.96)	(2.50)	(26.15)	(11.77)	(-3.43)
No. of observations	33,173	33,173	33,173	28,482	28,482	28,482
Adjusted R-squared	0.453	0.454	0.454	0.422	0.425	0.425
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	No	No	Yes	No

Table 4. UD laws and corporate default risk: dynamic model

This table presents the results from investigating the dynamic effects of UD laws adoption on the corporate default risks from 1993 to 2010. The dependent variable is either the expected default frequency (*EDF*) or the leading expected default frequency (*EDF_lead*). The four independent variables, $UD\ Law^{-2}$, $UD\ Law^{-1}$, $UD\ Law^{0}$, $UD\ Law^{+1}$, and $UD\ Law^{\geq+2}$, are indicator variables that take the value of 1 if the firm is incorporated in a state that will adopt UD laws next two years, will adopt UD laws next year, adopts the UD laws this year, adopted the UD laws one year ago, and adopted the UD laws two or more years ago The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects, year-fixed effects and state-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) EDF	(2) EDF	(3) EDF	(4) EDF_lead	(5) EDF_lead	(6) EDF_lead
$UD\ Law^{-2}$	-0.001	-0.001	-0.001	-0.011	-0.012	-0.012
	(-0.04)	(-0.08)	(-0.07)	(-0.80)	(-1.00)	(-0.87)
$UD\ Law^{-1}$	-0.014	-0.014	-0.014	-0.000	-0.001	-0.000
	(-1.47)	(-1.51)	(-1.60)	(-0.02)	(-0.09)	(-0.05)
$UD\ Law^{0}$	0.010	0.009	0.009	0.004	0.003	0.004
	(0.98)	(0.74)	(0.93)	(0.33)	(0.21)	(0.29)
$UD\ Law^{+1}$	0.008	0.006	0.006	0.039***	0.036***	0.037***
	(0.75)	(0.54)	(0.64)	(3.47)	(3.29)	(3.28)
$UD\ Law^{\geq+2}$	0.026**	0.025**	0.026**	0.023**	0.020*	0.021**
	(2.57)	(2.43)	(2.52)	(2.26)	(1.91)	(2.12)
Lnequity	-0.086***	-0.085***	-0.084***	-0.044***	-0.037***	-0.037***
	(-42.33)	(-36.64)	(-36.11)	(-29.17)	(-17.39)	(-16.59)
Lndebt	0.023***	0.022***	0.022***	0.015***	0.015***	0.015***
	(19.79)	(18.59)	(18.79)	(21.93)	(21.51)	(22.07)
Volatility	-0.020***	-0.020***	-0.020***	0.003***	0.002**	0.002**
	(-13.28)	(-14.24)	(-14.56)	(2.98)	(2.69)	(2.45)
ROA	-0.024***	-0.026***	-0.027***	-0.055***	-0.064***	-0.065***
	(-4.93)	(-3.98)	(-4.06)	(-11.29)	(-13.64)	(-13.52)
Excess return	0.018***	0.019***	0.019***	-0.042***	-0.040***	-0.040***
	(13.72)	(15.80)	(15.94)	(-25.89)	(-21.64)	(-22.06)
Bookmarket		0.005	0.005		0.024***	0.024***
		(0.78)	(0.82)		(3.53)	(3.59)
Independent		0.005	0.004		-0.007	-0.007
		(0.93)	(0.79)		(-0.90)	(-1.03)
Instown		-0.007	-0.007		-0.003	-0.002
		(-1.47)	(-1.46)		(-0.39)	(-0.31)
GDP growth			-0.109***			-0.063**
			(-3.10)			(-2.20)
Log GDP capita			0.014			0.056***
			(1.25)			(4.70)
Intercept	0.415***	0.248***	0.275**	0.191***	0.173***	-0.415***
	(49.15)	(13.64)	(2.40)	(26.14)	(12.17)	(-3.53)
No. of observations	33,173	33,173	33,173	28,482	28,482	28,482
Adjusted R-squared	0.453	0.454	0.454	0.422	0.425	0.425
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	No	No	Yes	No

Table 5. UD laws and corporate default risk: propensity score matching

This table reports the results from investigating the effects of voting premium on the UD laws using propensity score matching (PSM) methods. We identify treated firms with PSM-matched (control) firms based on a set of control variables. Panel A shows the comparison of mean differences between treated firms and control firms before and after matching. Panel B shows the regression results using a propensity score-matched sample. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

Panel A: Summary statistics of treated firms and control firms

Variable		Treated	Control	t-statistic	P-value
Lnequity	Before	5.115	5.124	-0.16	0.871
	After	5.115	5.078	0.52	0.604
Lndebt	Before	2.905	2.750	2.28	0.022**
	After	2.905	2.861	0.49	0.627
Volatility	Before	2.316	2.217	3.77	0.000***
	After	2.316	2.295	0.56	0.575
ROA	Before	-0.039	-0.083	5.73	0.000***
	After	-0.039	-0.043	0.54	0.593
Excess return	Before	0.042	0.038	0.20	0.841
	After	0.042	0.047	-0.17	0.864
Bookmarket	Before	0.735	0.596	7.94	0.000***
	After	0.735	0.748	-0.51	0.612

Panel B: Regression results using the propensity score-matched sample

	(1)
	EDF
UD Law	0.055**
	(2.05)
Lnequity	-0.085***
	(-8.15)
Lndebt	0.018***
	(5.36)
Volatility	-0.019**
	(-2.29)
ROA	-0.055
	(-1.32)
Excess return	0.025***
	(4.32)
Bookmarket	0.056***
	(3.13)
Independent	0.012
	(0.30)
Instown	-0.073*
	(-1.71)
GDP growth	-0.489
	(-1.54)
Log GDP capita	0.000
	(0.00)
Intercept	0.376
	(0.36)
No. of observations	3,160
Adjusted R-squared	0.516
Firm FE	Yes
Year FE	Yes

Table 6. UD laws and corporate default risk: entropy balancing

This table reports the results from investigating the effects of voting premium on the UD laws using entropy balancing methods. We identify treated (control) firms which are incorporated in the state that has (has not) adopted UD laws. Panel A shows the distribution of covariates between treatment group and control group before and after entropy balancing. Panel B shows the regression results of UD laws and corporate default risks using the entropy balancing sample. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

Panel A: Summary statistics of treated firms and control firms before and after entropy balancing

	Before Entropy Balancing					
	Treatment			Control		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Lnequity	5.115	3.906	0.142	5.124	4.243	0.211
Lndebt	2.905	5.772	-0.316	2.75	7.164	-0.242
Volatility	2.316	1.112	0.551	2.217	1.064	0.635
ROA	-0.039	0.062	-4.001	-0.083	0.092	-3.102
Excess return	0.042	0.540	2.398	0.038	0.592	2.303
Bookmarket	0.735	0.566	1.412	0.596	0.469	1.145
	After Entropy Balancing					
	Treatment			Control		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Lnequity	5.115	3.906	0.142	5.115	3.906	0.142
Lndebt	2.905	5.772	-0.316	2.905	5.772	-0.316
Volatility	2.316	1.112	0.551	2.316	1.112	0.551
ROA	-0.039	0.062	-4.001	-0.039	0.062	-4.001
Excess return	0.042	0.540	2.398	0.042	0.540	2.398
Bookmarket	0.735	0.566	1.412	0.735	0.566	1.412

Panel B: Regression results using the entropy balancing sample

	(1)
	EDF
UD Law	0.025**
	(2.24)
Lnequity	-0.082***
	(-23.79)
Lndebt	0.021***
	(13.05)
Volatility	-0.019***
	(-7.71)
ROA	-0.046***
	(-4.24)
Excess return	0.025***
	(13.48)
Bookmarket	0.036***
	(4.14)
Independent	0.005
	(0.50)
Instown	-0.026
	(-1.29)
GDP growth	-0.134**
	(-2.13)
Log GDP capita	0.002
	(0.12)
Intercept	0.352*
	(1.87)
No. of observations	33,173
Adjusted R-squared	0.494
Firm FE	Yes
Year FE	Yes

Table 7. Robustness checks

This table shows the robustness test results for the baseline regression model. Model (1) controls for the potential confounding legal events. BC (PP) is a dummy variable that takes the value of one if a firm is incorporated in a state that has adopted Business Combination laws (Poison Pill law), and zero otherwise. Model (2) excludes firms incorporated in Delaware from our sample. Model (3) exclude treated firms which are not incorporated in the Pennsylvania state. Model (4) exclude observations from crisis periods, including the financial crisis from 2008 to 2009 and the doc-com crisis from 2001 to 2002. The detailed definitions of variables are explained in the Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) EDF	(2) EDF	(3) EDF	(4) EDF
UD Law	0.021***	0.022**	0.009**	0.023**
	(2.77)	(2.37)	(2.67)	(2.48)
BC	0.015**			
	(2.39)			
PP	-0.003			
	(-0.37)			
Lnequity	-0.084***	-0.080***	-0.084***	-0.066***
	(-36.25)	(-14.12)	(-30.13)	(-28.92)
Lndebt	0.022***	0.020***	0.022***	0.018***
	(18.97)	(8.57)	(19.07)	(14.83)
Volatility	-0.020***	-0.017***	-0.020***	-0.017***
	(-14.53)	(-7.06)	(-15.93)	(-11.44)
ROA	-0.027***	-0.042***	-0.027***	-0.022***
	(-4.09)	(-3.32)	(-3.79)	(-3.29)
Excess return	0.019***	0.018***	0.019***	0.011***
	(15.93)	(5.61)	(15.77)	(6.56)
Bookmarket	0.005	0.016	0.004	0.012*
	(0.83)	(1.17)	(0.68)	(1.98)
Independent	0.004	0.016	0.004	0.011**
	(0.80)	(1.43)	(0.75)	(2.28)
Instown	-0.007	-0.005	-0.008*	-0.005
	(-1.44)	(-0.27)	(-1.72)	(-0.86)
GDP growth	-0.106***	-0.065	-0.095**	-0.122**
	(-2.96)	(-0.73)	(-2.46)	(-2.41)
Log GDP capita	0.013	0.009	0.015	0.006
	(1.24)	(0.23)	(1.38)	(0.41)
Intercept	0.263**	0.279	0.264**	0.269*
	(2.30)	(0.72)	(2.31)	(1.85)
No. of observations	33,173	11,589	32,114	26,195
Adjusted R-squared	0.454	0.445	0.451	0.423
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 8. UD laws and the alternative measure of corporate default risk: S&P credit rating

This table presents the results from investigating the effects of UD laws adoption on the S&P long-term credit rating as the alternative measure of corporate default risk. The dependent variable, *Credit_value*, is measured by the numerical value of the S&P long-term credit rating. The greater numerical value indicates higher credit risk. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects, year-fixed effects and state-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) Credit_value	(2) Credit_value	(3) Credit_value
UD Law	0.624***	0.624**	0.641***
	(2.89)	(2.52)	(2.94)
Lnequity	-0.843***	-0.844***	-0.847***
	(-19.45)	(-19.05)	(-18.87)
Lndebt	-0.015	-0.008	-0.005
	(-0.67)	(-0.31)	(-0.22)
Volatility	-0.362***	-0.349***	-0.351***
	(-17.18)	(-16.13)	(-15.95)
ROA	-0.001	0.094	0.090
	(-0.01)	(0.99)	(0.95)
Excess return	0.507***	0.473***	0.474***
	(12.93)	(12.44)	(12.29)
Bookmarket		-0.140***	-0.140***
		(-4.13)	(-4.14)
Independent		-0.361***	-0.363***
		(-3.40)	(-3.45)
Instown		-0.059	-0.068
		(-0.56)	(-0.66)
GDP growth			1.104**
			(2.37)
Log GDP capita			-0.454
			(-1.65)
Intercept	17.392***	16.729***	21.930***
	(78.60)	(41.31)	(8.14)
No. of observations	7,976	7,976	7,976
Adjusted R-squared	0.908	0.910	0.909
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
State FE	No	Yes	No

Table 9. Security class action lawsuits and corporate default risk

This table presents the relationship between security class action and corporate default risk. We exploit the 1999 ruling of the Ninth Circuit Court of Appeals as a natural experiment to examine the effects of weakened shareholder litigation rights on the corporate default risk. The dependent variable is the expected default frequency (*EDF*). The explanatory variable, *Ninth Circuit*, is an indicator that equals one for firms headquartered in the Ninth Circuit states after the 1999 ruling and zero otherwise. The Ninth Circuit states including Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, and Washington. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects, year-fixed effects and state-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of headquarters. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) EDF	(2) EDF	(3) EDF
Ninth Circuit	0.012***	0.014***	0.012***
	(2.69)	(3.04)	(2.69)
Lnequity	-0.080***	-0.075***	-0.075***
	(-9.62)	(-9.00)	(-8.93)
Lndebt	0.016***	0.015***	0.016***
	(8.66)	(8.14)	(8.21)
Volatility	-0.011***	-0.012***	-0.011***
	(-9.09)	(-9.41)	(-9.37)
ROA	-0.021**	-0.024**	-0.025***
	(-2.56)	(-2.66)	(-2.71)
Excess return	0.013***	0.014***	0.014***
	(6.47)	(6.36)	(6.36)
Bookmarket		0.011	0.011
		(1.27)	(1.28)
Independent		0.001	0.000
		(0.16)	(0.07)
Instown		-0.034**	-0.034***
		(-2.67)	(-2.74)
GDP growth			-0.012
			(-0.17)
Log GDP capita			0.027
			(1.20)
Intercept	0.418***	0.342***	0.120
	(10.47)	(6.75)	(0.52)
No. of observations	22,742	22,723	22,704
Adjusted R-squared	0.404	0.405	0.405
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
State FE	No	Yes	No

Table 10. UD laws and corporate default risk: financial constraints

This table presents the results from investigating the effects of UD laws adoption on the corporate default risk for financially constrained (FC) and unconstrained (Non-FC) subgroups. Financially constrained (unconstrained) firms are determined by the above (below) median of the SA index, the WW index, do not pay dividends (pay dividends), and do not have credit ratings (have credit ratings). The dependent variable is the expected default frequency (*EDF*). The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in the Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	SA index		WW index		Dividend payout		S&P credit rating	
	(1)	(2)	(3)	(4)	(5)	(6)	(5)	(6)
	FC	Non-FC	FC	Non-FC	FC	Non-FC	FC	Non-FC
UD Law	0.030*	0.014	0.028**	0.009	0.025***	0.006	0.022**	0.025
	(1.79)	(1.27)	(2.32)	(0.85)	(3.26)	(0.57)	(2.45)	(1.06)
Lnequity	-0.086***	-0.099***	-0.092***	-0.082***	-0.088***	-0.041***	-0.074***	-0.134***
	(-24.02)	(-20.07)	(-23.65)	(-9.17)	(-37.85)	(-6.96)	(-26.49)	(-17.33)
Lndebt	0.023***	0.018***	0.027***	0.013***	0.024***	0.004**	0.019***	0.039***
	(17.72)	(8.50)	(21.13)	(5.34)	(23.27)	(2.21)	(20.80)	(10.24)
Volatility	-0.026***	-0.014***	-0.029***	-0.013***	-0.026***	-0.008***	-0.022***	-0.006***
	(-11.71)	(-14.08)	(-14.90)	(-10.10)	(-22.49)	(-7.16)	(-12.61)	(-4.62)
ROA	-0.009	-0.089***	-0.012**	-0.145***	-0.015***	-0.237***	-0.023***	-0.126***
	(-1.05)	(-5.73)	(-2.53)	(-5.77)	(-2.97)	(-5.10)	(-5.86)	(-3.05)
Excess return	0.015***	0.035***	0.016***	0.032***	0.019***	0.023***	0.015***	0.050***
	(11.77)	(21.30)	(12.72)	(20.40)	(15.61)	(8.33)	(13.31)	(21.10)
Bookmarket	0.000	0.011	0.002	0.016	0.003	0.032***	0.009	0.008
	(0.06)	(1.53)	(0.38)	(1.34)	(0.54)	(2.92)	(1.53)	(0.92)
Independent	-0.026**	0.016**	-0.022**	0.010	0.023***	0.002	-0.005	0.027**
	(-2.44)	(2.16)	(-2.46)	(1.51)	(4.48)	(0.11)	(-0.82)	(2.31)
Instown	0.042***	-0.048***	0.056***	-0.047***	0.001	-0.021**	0.024***	-0.071***
	(3.03)	(-8.07)	(5.14)	(-8.70)	(0.12)	(-2.10)	(4.46)	(-6.98)
GDP growth	-0.157**	-0.044	-0.151***	-0.090***	-0.127***	-0.062	-0.053	-0.071
	(-2.35)	(-1.33)	(-2.97)	(-2.75)	(-2.96)	(-1.26)	(-1.34)	(-1.08)
Log GDP capita	-0.006	0.020	-0.014	0.044***	0.012	0.009	-0.021	0.060**
	(-0.27)	(1.29)	(-0.44)	(3.60)	(0.92)	(0.36)	(-1.12)	(2.16)
Intercept	0.438*	0.378**	0.521	0.062	0.285**	0.185	0.541***	0.153
	(1.95)	(2.51)	(1.63)	(0.52)	(2.09)	(0.77)	(2.89)	(0.58)
No. of observations	16,587	16,586	16,530	16,530	25,831	7,342	25,197	7,976
Adjusted R-squared	0.474	0.465	0.493	0.444	0.469	0.386	0.456	0.522
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 11. UD laws and corporate governance

This table presents the results from investigating the effects of the adoption of UD laws on corporate governance. The dependent variables are entrenchment index (*E-index*), governance index (*G-index*), and the portion of the number of co-opted board to the total board (*Co-option*) for model (1), model (2) and model (3) respectively. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in the Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) E-index	(2) G-index	(3) Co-option
UD Law	0.154*	0.333**	0.054**
	(1.90)	(2.50)	(2.39)
Size	0.076***	0.053	0.038***
	(3.40)	(1.40)	(3.82)
Capx	-0.289	-0.278	0.232**
	(-1.49)	(-0.51)	(2.48)
R&D	-0.673**	0.892*	-0.350***
	(-2.12)	(1.76)	(-4.38)
Leverage	-0.008	0.189	-0.065
	(-0.17)	(1.00)	(-1.50)
Cash	-0.239***	-0.269	0.025
	(-2.72)	(-0.87)	(0.84)
GDP growth	0.149	0.594	0.136
	(0.39)	(0.82)	(1.14)
Log GDP capita	-0.089	0.313	0.026
	(-0.33)	(0.36)	(0.41)
Intercept	2.544	4.673	0.004
	(0.92)	(0.52)	(0.01)
No. of observations	6,753	4,653	12,978
Adjusted R-squared	0.857	0.898	0.519
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 12. UD laws and performance volatility

This table presents the results from investigating the effects of the adoption of UD laws on firm performance volatility. The dependent variables are the stock return volatility (*Dret_std*), ROA volatility (*ROA_std*), and earnings at risk (*EAR*) for model (1), model (2) and model (3) respectively. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in the Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) Dret_std	(2) ROA_std	(3) EAR
UD Law	0.001**	0.016***	0.165***
	(2.68)	(2.74)	(2.72)
Lnequity	-0.004***	-0.018***	0.401***
	(-20.07)	(-9.38)	(41.57)
Lndebt	-0.000**	-0.004***	0.030***
	(-2.44)	(-6.18)	(7.88)
Volatility	-0.008***	-0.010***	0.046***
	(-53.71)	(-17.44)	(4.26)
ROA	-0.001*	0.035***	1.027***
	(-1.88)	(10.32)	(20.48)
Excess return	0.004***	0.008***	-0.087***
	(16.84)	(9.83)	(-12.99)
Bookmarket	-0.001***	-0.016***	0.031**
	(-4.81)	(-9.40)	(2.27)
Independent	0.003***	0.002	0.172***
	(4.61)	(0.51)	(5.14)
Instown	-0.001**	-0.013*	0.389***
	(-2.50)	(-1.73)	(7.78)
GDP growth	-0.003	-0.017	0.598*
	(-0.69)	(-0.83)	(1.92)
Log GDP capita	-0.001	0.037**	-0.295**
	(-0.95)	(2.40)	(-2.29)
Intercept	0.099***	-0.156	2.595**
	(5.89)	(-0.97)	(2.03)
No. of observations	33,173	33,022	33,173
Adjusted R-squared	0.751	0.594	0.751
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 13. UD laws and corporate risk-taking

This table presents the results from investigating the effects of UD laws adoption on corporate risk-taking. The dependent variables are different measures of corporate risk-taking. *Investment* is the total investment of capital, research and development, and acquisition expenses. *Leverage* is the ratio of total debt to the book value of assets. *Cash* is the corporate cash holdings. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) Investment	(2) Leverage	(3) Cash
UD Law	-0.006	0.011	0.005
	(-0.51)	(1.15)	(0.69)
Lnequity	0.000	-0.069***	0.022***
	(0.07)	(-29.63)	(18.02)
Lndebt	0.001	0.076***	-0.026***
	(1.14)	(23.69)	(-47.09)
Volatility	0.007***	-0.002**	-0.006***
	(8.23)	(-2.15)	(-11.18)
ROA	-0.280***	-0.118***	0.007
	(-19.54)	(-14.34)	(1.06)
Excess return	-0.005***	0.010***	0.001*
	(-3.34)	(4.11)	(1.69)
Bookmarket	-0.036***	-0.096***	0.005***
	(-6.80)	(-14.43)	(4.21)
Independent	-0.020***	0.002	-0.003
	(-3.47)	(0.38)	(-0.80)
Instown	0.021***	0.004	0.000
	(4.34)	(0.79)	(0.05)
GDP growth	0.064	-0.077*	-0.031
	(1.46)	(-1.98)	(-1.17)
Log GDP capita	-0.043	0.011	-0.017
	(-1.03)	(0.65)	(-1.47)
Intercept	0.599	0.329*	0.303**
	(1.38)	(1.85)	(2.55)
No. of observations	19,786	33,172	33,144
Adjusted R-squared	0.547	0.647	0.788
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 14. UD laws and the decision-making process

This table presents the results from investigating the effects of UD laws adoption on the decision-making process. The dependent variable is corporate strategy conformity, calculated by the sum of the standardized variance between t and t +4 of corporate policies. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) Strategy Conformity
UD Law	-1.123**
	(-2.34)
Lnequity	0.201**
	(2.26)
Lndebt	-0.021
	(-0.52)
Volatility	0.008
	(0.17)
ROA	-0.303*
	(-1.78)
Excess return	0.049*
	(1.96)
Bookmarket	0.244*
	(1.77)
Independent	-0.124
	(-0.93)
Instown	0.386*
	(1.99)
GDP growth	-1.792
	(-0.93)
Log GDP capita	-0.267
	(-0.43)
Intercept	-9.602
	(-1.53)
No. of observations	5,857
Adjusted R-squared	0.739
Firm FE	Yes
Year FE	Yes

Table 15. UD laws and weighted average cost of capital

This table presents the results from investigating the effects of UD laws adoption on the firm's weighted average cost of capital (*WACC*). The dependent variable is the weighted average cost of capital, calculated by taking the average rate of the firm's overall cost of capital from both equity and debt, with each rate being weighted based on its respective proportion of the total capital. In particular, the cost of equity is estimated from Fama and French three factors model. The independent variable, *UD Law*, is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise. The detailed definitions of variables are explained in Appendix B. The regression model includes firm-fixed effects and year-fixed effects. t-statistics are reported in parentheses, with heteroscedasticity-robust standard errors clustered by the state of incorporation. The symbols ***, **, and * denotes statistical significance levels for 1%, 5%, and 10% respectively.

	(1) WACC
UD Law	0.002**
	(2.16)
Lnequity	0.007***
	(16.59)
Lndebt	-0.009***
	(-26.16)
Volatility	0.000*
	(1.76)
ROA	-0.008***
	(-4.71)
Excess return	0.002***
	(8.14)
Bookmarket	-0.003***
	(-5.61)
Independent	-0.002**
	(-2.31)
Instown	0.002**
	(2.31)
GDP growth	0.010
	(0.70)
Log GDP capita	0.011***
	(2.83)
Intercept	0.031
	(0.75)
No. of observations	19,024
Adjusted R-squared	0.935
Firm FE	Yes
Year FE	Yes

Appendix A.

Adoption of Universal Demand (UD) Laws

Year	State	Citation
1989	GA	Georgia Code Ann. § 14-2-742
1989	MI	Michigan Comp. Laws Ann. § 450.1493a
1990	FL	Florida Stat. Ann. § 607.07401
1991	WI	Wisconsin Stat. Ann. § 180.742
1992	MT	Montana Code Ann. § 35-1-543
1992	VA	Virginia Code Ann. § 13.1-672.1B
1992	UT	Utah Code Ann. § 16-10a-740(3)
1993	NH	New Hampshire Rev. Stat. Ann. § 293-A:7.42
1993	MS	Mississippi Code Ann. § 79-4-7.42
1995	NC	North Carolina Gen. Stat. § 55-7-42
1996	AZ	Arizona Rev. Stat. Ann. § 10-742
1996	NE	Nebraska Rev. Stat. § 21-2072
1997	CT	Connecticut Gen. Stat. Ann. § 33-722
1997	ME	Maine Rev. Stat. Ann. 13-C, § 753
1997	PA	Cuker v. Mikalauskas (547 Pennsylvania. 600, 692 A.2d 1042)
1997	TX	Texas Bus. Corp. Act. § 5.14c
1997	WY	Wyoming Stat. § 17-16-742
1998	ID	Idaho Code § 30-1-742
2001	HI	Hawaii Rev. Stat. § 414-173
2003	IA	Iowa Code Ann. § 490.742
2004	MA	Massachusetts Gen. Laws Ann. Ch. 156D, § 7.42
2005	RI	Rhode Island Gen. Laws § 7-1.2-710(C)
2005	SD	South Dakota Codified Laws 47-1A-742

Appendix B.

Definitions of variables	
Dependent variables	
EDF	Expected default frequency (Bharath and Shumway, 2008) in year t, calculated as N(-DD) where *DD* is the distance to default and N(.) is the cumulative standard normal distribution function.
Credit_value	All S&P long term credit ratings are converted into numerical value: AAA=1, AA+=2, AA=3, AA-=4, A+=5, A=6, A-=7, BBB+=8, BBB=9, BBB-=10, BB+=11, BB=12, BB-=13, B+=14, B=15, B-=16, CCC+=17, CCC=18, CCC-=19, CC=20, C=21, and D=22. The greater numerical values indicate higher credit risks.
Ln(number)	The natural log of the number of firms incorporated in a state each year.
E-index	The firm's entrenchment index consisting of 6 governance provisions in a given year.
G-index	The firm's governance index consisting of 24 governance provisions in a given year.
Co-option	The portion of the number of coopted board to the total number of board in a given year.
Dret_std	The standard deviation of a firm's daily stock returns (*RET*) over the previous year.
ROA_std	The standard deviation of ROA (*IB/AT*) during the past three year.
EAR	The earing at risk (*EAR*) measures the worst potential change a firm may experience within a specific time periods at a given confidence level, defined as $EAR = \eta + Z_{\frac{1-\alpha}{2}}\sigma$. Where η is the natural log of the firm's quarter pretax income (PIQ). σ is the standard deviation of PIQ in a year. $Z_{\frac{1-\alpha}{2}}$ represents the critical value from the standard normal distribution of earnings at the confidence level of 95%.
Strategic conformity	The sum of the standardized variance between t and t + 4 of each of the following indicators of corporate policies: (1) advertising intensity (*advertising/sales*); (2) research and development intensity (*R&D/sales*); (3) plant and equipment newness (*net P&E/gross P&E*); (4) nonproduction overhead (*SG&A expenses/sales*); (5) inventory levels (*inventories/sales*); (6) financial leverage (*debt/equity*). Each of these indicators of corporate policies is standardized by subtracting the industry's mean and dividing by the standard deviation of the industry, and then taking the absolute difference between a firm's value and the average value for all firms in the same 2-digit SIC industry. The sum of the standardized variance is then multiplied by minus one to proxy for strategy conformity.
WACC	The weighted average cost of capital is calculated by the weighted average value of both the cost of equity and the cost debt, defined as *WACC=COE*(1-LEV)+COD*LEV*(1-TAX)*. Specifically, the cost of equity (*COE*) is estimated from

	the Fama and French three factor model. The cost of debt (*COD*) is calculated by interest expense (*XINT*) divided by the value of debt (*DLTT+DLC*). The market leverage (*LEV*) is ratio of the value of debt (*DLTT+DLC*) to the market value of asset (*AT+PRCC_F*CSHO-SEQ-TXDB*). The corporate average tax rate (*TAX*) is calculated by the income taxes scaled by pretax income (*PI*).
Investment	The sum of capital expenditure (*CAPX*), R&D expenses (*XRD*) and acquisitions expenses (*AQC*), scaled by total assets (*AT*).
Leverage	Long term debt (*DLTT*), plus debt in current liabilities (*DLC*), scaled by total assets (*AT*).
Cash	Cash and marketable securities (*CHE*) divided by total assets (*AT*).
Independent variables	
UD Law	It is a dummy variable that takes the value of 1 if the firm is incorporated in a state that has adopted UD laws and zero otherwise.
Ninth Circuit	It is an interaction indicator that equals one if the firm is headquartered in the Ninth Circuit states after the year 1999 and zero otherwise. The Ninth Circuit states include Alaska, Arizona, California, Hawaii, Idaho, Montana, Nevada, Oregon, and Washington.
Control variables	
Lnequity	The natural log of the market of equity, calculated as the product of the number of shares outstanding (*CSHO*) and the stock price at the end of the year (*PRCC_F*).
Lndebt	The natural log of the face value of debt, calculated as the sum of debt in current liabilities (*DLC*) and one-half of long-term debt *(DLTT*) at the end of the year.
Volatility	The inverse of the annualized stock return volatility, calculated from monthly stock returns over the previous year.
ROA	Earnings before extraordinary items (*IB*) divided by assets (*AT*).
Excess return	Annual excess return, estimated from the difference between firm's annual stock return calculated from monthly returns (*RET*) over the past 12 months, and return on the CRSP value-weighted index (*VWRETD*) during the same periods.
Bookmarket	Book value of equity (*CEQ*) divided by market value of equity (*PRCC_F*CSHO*).
Independent	The ratio of the number of independent directors to the total number of boards.
Instown	The percentage of shares outstanding owned by institutional investors.
Log GDP	The natural log of a state GDP.
GDP growth	The state-level GDP growth over the fiscal year.
Log GDP capita	The natural log of a state GDP per capita.
Size	The natural log of the firm’s total assets (*AT*).
Capx	Capital expenditures (*CAPX*), scaled by total assets (*AT*).
R&D	Research and development expenditures (*XRD*), scaled by total assets (*AT*).

Financial constraints	
SA index	The size-age (*SA*) index is defined as: *SA index = −0.737 * AT +0.043 * AT * AT –0.040 * Age,* where *AT* is the book value of assets, and *Age* is the number of years the firm has existed in Compustat.
WW index	The WW index is defined as *WW index = –0.091 * CF – 0.062 * DIVPOS + 0.021 * TLTD – 0.044 * LNTA + 0.102 * ISG – 0.035 * SG*, where *CF* is the ratio of cash flow to the book value of assets; *DIVPOS* is a dummy variable that equals to one if the firm pays dividends in a given year, and zero otherwise; *TLTD* is the ratio of the long-term debt to the book value of assets; *LNTA* is the natural log transformation of the book value of assets; *ISG* is the firm's three-digit SIC industry sales growth; and *SG* is the firm's sales growth.