# The Pricing and Economic Impact of Legal Risk *

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**Abstract**

Legal risk is an inherent feature of the market, arising from the institutional foundations that enable economic activity, yet it remains difficult to observe systematically across firms. To address this gap, this paper constructs a text-based measure of firm-level legal risk using earnings call transcripts. Firms exposed to class action lawsuits, regulatory scrutiny related to climate issues and bankings, and cybersecurity threats tend to exhibit higher risk scores. Legal risk has real and financial consequences: a one standard deviation increase predicts a 3–8% decline in future investment and reduces firms' reliance on debt when facing financing needs, consistent with a precautionary motive. A long-short portfolio that buys high-risk firms and sells no-risk firms earns an annualized return of 4.7% (t-stat: 3.6), increasing to 7.1% (t-stat: 4.9) post-2010 when regulatory oversight intensified. The pricing of legal risk varies across legal origins, reflecting its institutional foundations.

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# 1 Introduction

> *"[...] [U]nder the Rule of Law, the government is prevented from stultifying individual efforts by ad hoc action. Within the known rules of the game, the individual is free to pursue his personal ends and desires, certain that the powers of government will not be used deliberately to frustrate his efforts."*
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> – Friedrich A. Hayek, *The Road to Serfdom* (1944, p. 76)

A well-functioning economy relies on the rule of law. Legal and regulatory institutions (such as courts, government agencies, and financial regulators) provide the foundation for economic activity by ensuring that contracts are upheld and property rights are protected, fostering investment and facilitating transactions. However, these same institutions also create legal risk, as businesses must operate within an evolving landscape of laws and regulations. As legal systems expand and regulatory oversight intensifies, firms face increasing complexity in compliance and exposure to potential litigation. In this vein, legal risk is a fundamental aspect of markets.[1]

[ INSERT FIGURE 1 HERE ]

In the U.S., legal risk has grown more prominent due to the increasing complexity of legal proceedings, regulatory scrutiny, and contractual disputes. For example, litigation-prone industries[2] have expanded both in number and market capitalization, particularly since the early 2000s, as shown in Figure 1. This trend is further reflected in the sharp rise in securities class action lawsuits, which have more than doubled since the 1990s despite a decline in the number of publicly listed firms,[3] as well as the tripling of patent disputes since 2005 (Cohen et al. 2019). Moreover, regulatory enforcement actions have surged in the post-Global Financial Crisis era. As a result, firms operating in the U.S. economy have become increasingly exposed to legal risk, with legal challenges playing a growing role in shaping both valuations and real business decisions.

[1] A notable counterexample is Venezuela under President Hugo Chávez in the late 1990s and early 2000s, where the erosion of judicial independence and widespread expropriation undermined the rule of law. The Chávez administration frequently bypassed legal norms, nationalized key industries without consistent compensation, and concentrated power in the executive branch. This breakdown in institutional checks led to heightened uncertainty for investors, capital flight, and a collapse in private investment—highlighting how the absence of reliable legal frameworks can destabilize markets and deter economic activity.

[2] These include firms in the pharmaceutical and biotechnology sectors (SIC 2833 - 2836), computer and office equipment (SIC 3570 - 3577), software and IT services (SIC 7370 - 7374), and electronic and electrical equipment (SIC 3600 - 3674).

[3] See https://corpgov.law.harvard.edu/2021/03/11/recent-trends-in-securities-class-action-litigation/.

One compelling avenue to study legal risk and its broader economic implications is through the behavior of publicly traded firms. Financial markets aggregate investor expectations, incorporating assessments of risk that influence firm valuation and capital allocation.[4] At the same time, legal risk shapes firm behavior by influencing cash flows, governance structures, and financing constraints. These dual channels—through prices and real decisions—motivate the core question of this paper: To what extent is legal risk systematically priced by investors, and how does it affect firms' real economic decisions?

To address this question, this paper develops a firm-level measure of legal risk using textual analysis of earnings call transcripts. While institutions influence investment incentives, financial markets, and economic growth at the macro level (Acemoglu et al. 2001, Acemoglu and Johnson 2005), their role in shaping firm-level legal risk remains underexplored. This paper's approach—measuring a firm's attention to legal issues through earnings call transcripts—is grounded in the idea that these calls reflect the real-time concerns of economic agents, offering a dynamic lens into how firms and markets perceive and respond to legal uncertainty.

At the firm level, the proposed legal risk measure effectively captures concerns related to class action lawsuits, climate issues, cybersecurity threats, and banking regulations (see Sections 3.2 and 3.3 for detailed case studies). Legal risk has real economic consequences: firms with higher perceived legal risk tend to reduce future investment and rely less on debt financing when facing external capital needs. This cautious financial behavior is consistent with the idea that legal uncertainty raises the expected cost of financial distress. At the aggregate level, asset pricing results reveal a persistent return premium associated with legal risk: a long-short portfolio that buys firms with high legal risk exposure and sells those with no exposure delivers an annualized return of 4.7% (t-stat: 3.6) over the period July 2004 to June 2024. This premium strengthens to 7.1% (t-stat: 4.9) in the post-Global Financial Crisis era, when heightened regulatory scrutiny amplified firms' legal exposure. Firms with high legal risk are particularly vulnerable to legal tail events, facing heightened uncertainty from lawsuits, regulatory actions, and compliance burdens that can influence both valuation and corporate behavior. As a result, investors demand higher compensation for bearing this risk. These findings are consistent with the predictions of the Law-CAPM, a simple equilibrium model that extends traditional asset pricing frameworks by incorporating legal risk as a priced factor. Finally, the legal risk factor captures a broader spectrum of firm-level uncertainty than existing text-based measures and fully subsumes the cyber risk factor while remaining largely orthogonal to other known

[4]See Online Appendix A for case evidence on how legal risk materialization impacts firm valuations.

risk factors. This paper highlights the crucial role of the rule of law in shaping economic activity, investment decisions, and market behavior. Legal and regulatory institutions underpin economic stability by enforcing contracts and protecting property rights, but they also introduce legal risk as firms navigate evolving litigation and compliance demands. Legal risk is significant at both the firm and market levels, emphasizing its growing influence in finance. Understanding its impact on valuation and capital allocation is essential for research in law and finance.

**Literature review:** The current study intersects several strands of literature assessing the impact of legal systems on economics and finance. First, previous research examining stock price reactions to lawsuits—whether targeting individual firms or their industry peers—generally reports a negative price impact (see Kamma et al. 1988; Gande and Lewis 2009; Hadlock and Sonti 2012). However, this paper extends beyond these event studies, which focus on the announcement or resolution of lawsuits, by adopting a tradable calendar-time portfolio approach to examine various asset pricing tests and demonstrate that legal risk is a priced factor in the cross-section of stock returns.

Another strand of research in comparative economics examines how variations in legal origins and institutional frameworks shape financial markets (see La Porta et al. 1998; Glaeser and Shleifer 2002; Djankov et al. 2003; Rajan and Zingales 2003; Beck et al. 2005; and McLean et al. 2012). These studies highlight how differences in judicial efficiency, investor protection, and regulatory enforcement impact market dynamics, corporate behavior, and capital allocation. While the current paper focuses primarily on the U.S. financial market, characterized by high judicial efficiency and relatively low market imperfections, initial cross-country evidence suggests that the pricing of legal risk varies by legal origin: legal risk appears to be priced in the United States (a common law system), but not in civil law countries such as France or Germany.

In corporate finance, numerous literature documents the impact of legal risks on shaping firm behavior and strategic decision-making. Studies by Hughes and Thakor (1992) and Lowry and Shu (2002) suggest that companies facing heightened legal risk may underprice their IPOs as a defensive strategy. Furthermore, firms with significant legal exposure often pursue aggressive growth strategies, such as acquisitions, as observed by Gormley and Matsa (2011). Legal risk also impacts corporate disclosure practices, as firms adjust their transparency levels to minimize exposure to legal or regulatory scrutiny (Skinner 1994). Similarly, auditors are more cautious with high-risk clients, either avoiding them

altogether or charging premium fees to account for potential legal liabilities (Shu 2000). Moreover, litigation imposes substantial costs, not only in the form of legal fees, settlement expenses, and the risk of personal liability but also through significant managerial time demands, distractions caused by negative publicity, and reputational damage.

While recent literature has increasingly developed ex-ante measures of legal or litigation risk, most efforts have focused on industry or geographic levels rather than firm-level analyses. For instance, in their pioneering study, Francis et al. (1994) found that companies in biotechnology, computers, electronics, and retail industries face elevated litigation risks. Building on this, Kim and Skinner (2012) argue that industry affiliation alone is insufficient for predicting securities litigation risk, recommending the inclusion of key firm-specific characteristics like size, growth, and stock volatility to improve prediction. More recently, Hossain et al. (2023) use the liberal ideology of district court judges as an exogenous proxy for ex-ante litigation risk. Additionally, Bennett et al. (2023) use 10-K reports to extract litigation-relevant information but stop short of linking these findings to stock return predictions. This paper contributes to the existing literature by providing an ex-ante measure of legal risk at the firm level. To the best of my knowledge, this is the first empirical study to demonstrate that legal risk is a priced factor in the U.S. stock market. This paper also adds to the growing body of literature examining the relationship between legal outcomes and stock prices. Cohen et al. (2013) show that U.S. Senators' voting behavior on bills that ultimately become law has a significant impact on industry-level pricing. Similarly, Florackis et al. (2023) demonstrate that cybersecurity risk is priced in the cross-section of stock returns—a finding indirectly related to this paper, as firms facing cyberattacks may be exposed to legal claims, liabilities, or regulatory penalties under privacy protection laws. Similarly, Bereskin et al. (2023) examines the asset pricing effects of patent infringement litigation by comparing the stock returns of alleged infringers with those of similar firms not involved in patent disputes. While this research shares a similar focus on the impact of litigation risk on asset pricing, the approach developed in this paper is broader in both the scope of litigation types and the sample of firms analyzed. Specifically, I account for litigation risk stemming not only from patent-related cases but also from class-action lawsuits and Supreme Court matters. Additionally, the current paper covers a wider sample by including all firms that hold earnings calls, providing more comprehensive market coverage.

This paper also contributes to the growing literature on text-based methods in economics and finance. Researchers have developed techniques to quantify risk from textual data (Baker et al. 2016, Manela and Moreira 2017, Hassan et al. 2019, among others) and have

leveraged these measures to forecast economic and financial outcomes. Using quarterly earnings call transcripts, Sautner et al. (2023), Jamilov et al. (2025), and Kruttli et al. (2025) have applied similar approaches to estimate firm-level exposure to climate change, cyber risk, and extreme weather events, respectively.

**Structure of the Paper:** The remainder of the paper is organized as follows. Section 2 details the construction of the firm-level legal risk measure using textual analysis of earnings call transcripts. Section 3 examines the variation in legal risk across firms and industries, with support from detailed case studies. Section 4 presents the asset pricing implications, showing that legal risk is a priced factor in the cross-section of stock returns. Section 5 discusses the robustness and distinctiveness of the legal risk factor relative to other text-based measures and considers its relationship to legal origins. Section 6 explores the economic consequences of legal risk, focusing on its effects on corporate investment and financing decisions. Finally, Section 7 concludes.

# 2 Data and Methods

## 2.1 Extracting Legal Risk from Corporate Earnings Conference Calls

[ INSERT TABLE 1 HERE ]

I construct a text-based measure of ex-ante legal risk at the firm-level using quarterly earnings conference calls transcripts of U.S. firms.[5] A key advantage of this approach is that it captures forward-looking legal concerns, rather than ex-post litigation outcomes. In that vein, the (transcripts of) conference calls provide a natural context to learn about the risks firms face and market participants' views thereof (Hassan et al. 2019). Table 1 highlights instances where firms explicitly discuss legal risks in earnings calls, demonstrating how legal uncertainty is a relevant dimension of firm valuation.

[5]Typically, firms hold quarterly earnings calls, each aligned with the release of their financial results. These calls begin with a structured management presentation, where senior executives provide an overview of the company's recent performance, financial health, and key operational developments. Following the presentation, the call opens to a Q&A session, during which analysts and, occasionally, investors engage management directly, probing into areas such as strategic initiatives, market challenges, and specific financial metrics. This interactive portion of the call is critical, as it allows stakeholders to gauge management's preparedness, transparency, and responsiveness to both expected and unforeseen circumstances.

For instance, in an October 2024 earnings call, Alphabet Inc. (Google) stated: *"But it looks like the way that the Google versus DOJ search trial is going, there's a decent likelihood that the Apple ISA contract and some of the Android pre-install contracts are going to be voided at some point in the future."* This statement refers to the U.S. Department of Justice's (DOJ) high-profile antitrust lawsuit against Google, which alleges that the company has abused its dominant position in online search by securing exclusive agreements—such as the Apple ISA (Information Services Agreement)—to pre-install its search engine on mobile devices. The potential voiding of these contracts could significantly disrupt Google's traffic acquisition strategy and revenue model, particularly its lucrative mobile search business. The legal uncertainty surrounding the case has not only weighed on Google's stock price but also influenced broader market expectations about future regulatory interventions in the technology sector.

More broadly, the fact that firms openly discuss legal risks in high-stakes earnings calls where their words are scrutinized by analysts, investors, and regulators suggests that these mentions are far from mere "cheap talk" (Crawford and Sobel 1982; Farrell and Rabin 1996). Earnings conference calls are typically broadcast live over the internet, which encourages management to avoid excessive legal language or jargon, making the information more accessible and transparent.[6] Therefore, mentions of legal risk in earnings call transcripts are particularly meaningful, as their frequency reflects substantive concerns rather than strategic messaging or rhetorical hedging.

A key aspect of this analysis is the construction of a training library of legal bigrams. I initiate this process using the Loughran-McDonald (LM) Dictionary (Loughran and McDonald 2011), particularly its "litigious (Fin-Lit)" category, which encompasses legal jargon and terms related to litigation. The 2023 edition of the LM Dictionary contains 86,553 keywords, 903 of which fall under the "litigious" category. However, rather than relying on unigrams of legal terms as listed in the LM dictionary, the current paper's approach focuses on developing a dynamic bigram (or trigram) library tailored to context-specific legal terminology to minimize misclassification and reduce measurement error.[7]

[ INSERT TABLE 2 HERE ]

[6] This is in line with the 10-K sample as documented in Loughran and McDonald (2011), where the authors find that the Management's Discussion and Analysis (MD&A) section tends to contain fewer litigation-related terms compared to the full 10-K document (see Table 2 of that paper).

[7] Refer to Section 5.1 for a comparison highlighting how my approach differs from that of Loughran and McDonald (2011).

With the training library of legal terms $\mathbb{L}$ established (see Table 2 and Online Appendix B), I proceed to define a simple measure of **LRISK**, representing the legal or litigation risk of firm $i$ at quarter $t$ as:

$$\textbf{LRISK}_{it} = \frac{\sum_{b}^{B_{it}} \Big( \mathbb{1}[b \in \mathbb{L}] \Big)}{\text{No. of sentences}} \tag{1}$$

where $b = 0, 1, ...B_{it}$ are the bigrams contained in call of firm $i$ at time $t$, $\mathbb{1}[\cdot]$ is the indicator function, $\mathbb{L}$ is the set of bigrams contained in $\mathbb{L}$. In summary, the legal risk faced by each firm at any moment is expressed as a simple sum of legal-related content, scaled by the total number of sentences in that transcript. **LRISK** can be further divided into three categories: **LRISK_COURT**, which captures references to court proceedings and judicial actions; **LRISK_TRIAL**, which focuses on mentions of trials and litigation processes; and **LRISK_TERMS**, which includes broader legal terminology such as "legal costs" and "regulatory compliance."

## 2.2 Stock Market and Accounting Data

To examine the financial and real effects of legal risk, I match the firm-level legal risk exposure—constructed from quarterly earnings call transcripts—to stock market data from CRSP and accounting data from COMPUSTAT over the 2002–2024 period.[8] The CRSP dataset provides information on stock returns, market capitalization, and share characteristics, allowing for the construction of asset pricing tests such as portfolio returns and factor loadings. COMPUSTAT offers detailed firm-level fundamentals, including balance sheet and income statement items, which are essential for analyzing investment behavior, capital structure decisions, and control variables in regression analyses. This merged panel forms the empirical backbone of the paper.

[8]While extending the analysis further back is not feasible due to the limited availability of transcripts (which begin in 2002), the 20-year sample offers a strong foundation for developing investment strategies, covering two major economic recessions (2008 and 2020). Also, unlike Bereskin et al. (2023) that constructs a tradable portfolio on subset of firms that the power is drawn from the entire cross-section of samples as most firms publich earnings calls. Additionally, Figure 1 illustrates the rising number of litigation-prone industries around the turn of the century, underscoring the growing relevance of legal risk since 2000.

# 3 Firm-level Variation in Legal Risk

This section examines firm-level variation in legal risk exposure, as constructed in the previous section. Through detailed case studies, it explores how well-known firms and industries respond to emerging legal risks, demonstrating that the legal risk exposure measure introduced in this paper effectively captures firms' concerns about legal uncertainty and helps assess both its internal consistency and external validity.

## 3.1 Legal Risk: Descriptive Statistics

[ INSERT FIGURE 2 HERE ]

Figure 2 demonstrates that the sample of earnings call-releasing firms analyzed in this study is representative of the overall U.S. stock market. The top panel shows the number of firms releasing earnings calls from 2002 to 2024. The sample consists of standard U.S. stocks listed on the three major exchanges—NYSE, NASDAQ, and NYSE American (formerly AMEX)—and includes only ordinary shares, identified by CRSP share codes 10 or 11. Around 55% of firms began publishing earnings calls in 2002, and this percentage steadily increased, surpassing 80% by 2010. By the late 2010s, the number had reached 85%, though there was a slight decline following the onset of COVID-19. A similar pattern is observed in how these firms represent the market. The middle panel shows that, after 2010, these firms account for approximately 85% of the entire market capitalization. The bottom panel of the figure presents the ratio of the top 100, 500, and 1500 firms by market capitalization at the end of each June. The data indicates that nearly all of the top 100 and 500 firms consistently publish earnings calls each year, suggesting that the sample considered in this paper is highly representative of the U.S. stock market.

[ INSERT FIGURE 3 HERE ]

Using earnings call transcript data, Figure 3 illustrates the changes in legal risk exposure for prominent corporate entities, most of which are constituents of the well-known S&P 500 index. In each firm's figure, the y-axis categorizes legal risk exposure into three levels: 1 (no legal risk), 2 (moderate legal risk), and 3 (high legal risk), as defined in the following section.

The figure reveals that firms frequently transition between different levels of legal risk exposure, highlighting that legal risk is dynamic and not confined to a specific subset of firms. For instance, Ford Motor Company faced multiple lawsuits in the mid-2000s, including Employment Discrimination related to Apprenticeship Testing (2004–2005), discrimination in loan rates (2005), and Product Liability cases involving sudden acceleration and defective vehicle components (2006). During this period, legal risk exposure, as indicated in the 2006 earnings call transcripts, escalated from a moderate level (2) to the highest level (3). Similarly, Coca-Cola experienced heightened mentions of legal risk during 2020 and 2021, coinciding with significant legal challenges. These included Environmental Greenwashing Allegations (*Earth Island Institute v. Coca-Cola Co.*) where the company was accused of overstating its sustainability efforts while contributing substantially to plastic pollution. Additionally, Coca-Cola faced the 100% Recyclable Labeling Lawsuit (*Swartz v. Coca-Cola Co.*), which challenged the company's claims about the recyclability of its plastic bottles.

[ INSERT FIGURE 4 HERE ]

I next explore the industry distribution of legal risk measure. Figure 4 illustrates the distribution of firms across three legal risk categories—No Risk, Medium Risk, and High Risk—represented by green, yellow, and red bars, respectively, conditional on their industry. The industry definitions follow the Fama-French 17 industry classification. On average, firms' mentions of legal risk appear balanced across industries, as indicated by the relatively even distribution of firm-month observations on the y-axis. However, certain industry categories exhibit higher levels of legal risk, as documented in the transcripts of earnings calls, compared to others.

For instance, the utilities sector (denoted as "Utils (14)") shows a significant concentration of firm-month observations in the high-risk portfolio. This concentration aligns with the unique characteristics of the utilities sector, including the nature of its services, the regulatory framework within which it operates, and its distinct business models. Similarly, the finance and accounting literature identifies several sub-industries with elevated exposure to legal risk: pharmaceuticals and biotech products (SIC 2833–2836; industry category 7), computer and office equipment manufacturing (SIC 3570–3577; industry category 11), electronic equipment and components (SIC 3600–3674; industry category 11), and retail industries (SIC 5200–5962, primarily categorized under industry label 15, with others under label 8).[9] The figure highlights that these industry categories tend to exhibit higher

[9]Computer programming and IT services (SIC 7370–7374), although known for legal risk, are omitted

levels of legal risk exposure, as evidenced by the prevalence of yellow (Medium Risk) and red (High Risk) bars compared to green (No Risk). Overall, the industry decomposition presented in Figure 4 confirms that the portfolio analysis is not disproportionately influenced by any single industry or a small subset of industries. Instead, it provides a comprehensive view of the legal risks faced by firms across various industries.

## 3.2 Case Studies: Are Brown Firms More Exposed to Legal Risk?

[ INSERT FIGURE 5 HERE ]

A growing body of research in finance examines the implications of climate change for financial markets, with particular attention to the risks associated with carbon emissions and regulatory oversight.[10] Stroebel and Wurgler (2021), in particular, emphasize that regulatory risk is perceived as the most immediate climate-related concern for businesses and investors. Given these insights, legal risk presents a crucial dimension of climate finance. *Brown* firms (those with high carbon footprints and heavy reliance on fossil fuels) face increasing scrutiny from regulators, litigation risks from environmental lawsuits, and reputational damage due to changing investor and consumer preferences.

Figure 5 illustrates firm-level legal risk exposure of major energy companies (*Brown* firms), including ConocoPhillips, ExxonMobil, and Halliburton, highlighting periods of heightened legal concerns related to climate regulations, relevant litigations, and firm-specific legal events such as M&A transactions. ConocoPhillips (upper panel) saw increased legal risk in 2002 (FTC approval of its merger with Phillips Petroleum), 2007 (Venezuelan expropriation of the Corocoro oil field that led to arbitration proceedings), 2012 (spinoff of Phillips 66 which involved complex regulatory approvals), 2015 (the company settled $11.5 million in environmental litigation over gasoline storage violations in California), 2018 (lawsuit with Oklahoma homeowners over soil and water contamination), and 2023 (scrutiny over oil sands investments led to exclusion from sustainability-focused portfolios). ExxonMobil (middle panel) saw spikes in legal risk in 2009–2010 (shareholder litigation following its $41 billion acquisition of XTO Energy), 2015 (a controversial $225

from the analysis as they are classified under the "Others" category in the Fama-French 17 industry system.

[10] Studies such as Bolton and Kacperczyk (2021) find that firms with higher carbon emissions tend to earn higher stock returns, suggesting that investors demand compensation for exposure to carbon risk. Similarly, Pastor et al. (2022) highlight how green assets have delivered strong returns in recent years due to shifting investor preferences and regulatory developments, though their expected future returns may be lower.

million settlement with New Jersey over decades of environmental damage at two refineries), and 2024 (a lawsuit filed by the State of California accusing the company of misleading consumers about the recyclability of plastic waste). Finally, Halliburton (lower panel) experienced heightened legal risk in 2004 (a multibillion-dollar settlement to resolve extensive asbestos-related litigation stemming from its former subsidiaries' use of asbestos in construction materials), 2013 (legal proceedings related to its role in the 2010 Deepwater Horizon oil spill, culminating in a $1.1 billion settlement in 2014), and 2016 (failed $34.6 billion merger with Baker Hughes, which was blocked by regulators over antitrust concerns, resulting in a $3.5 billion termination fee).

Overall, the spikes in legal risk exposure in Figure 5 align with major legal disputes, validating the effectiveness of the firm-level legal risk measure in capturing periods of heightened regulatory and litigation risk.

### 3.3 Case Studies: Are Banks More Exposed to Legal Risk?

The banking sector has long been a focal point for legal and regulatory risk, owing to its systemic importance and tight supervision. Legal exposure has intensified following the 2008 financial crisis, with post-crisis reforms and heightened enforcement actions increasing banks' vulnerability to litigation and reputational damage. Case studies of Citigroup, Bank of America, and Wells Fargo illustrate how legal risk has shaped firm strategy and investor perceptions over time. Notably, recent research in Fahlenbrach et al. (2012) finds that bank performance in past crises strongly predicts outcomes in future crises—suggesting that persistent risk culture and business models play a significant role in how banks navigate legal and systemic shocks.

[ INSERT FIGURE 6 HERE ]

This section examines Citigroup, Bank of America, and Wells Fargo to assess how legal risk has shaped their operations and investor perceptions over time. Citigroup faced major legal challenges in 2011 and 2014. In 2011, the SEC fined Citigroup $285M for misleading investors about a $1B collateralized debt obligation (CDO), concealing its role in asset selection while betting against it. In 2014, the DOJ imposed a $7B settlement for its role in selling faulty residential mortgage-backed securities (RMBS) pre-2009, including a record $4B civil penalty under FIRREA. These legal risks were reflected in earnings call transcripts, as shown in Figure 6 (Panel A). In Panel B, Bank of America's legal risk spiked

during 2002–2005, 2012, and 2022. During this period, it was implicated in the Parmalat scandal, resulting in a $98.5M settlement, joined the $26B National Mortgage Settlement in 2012 over foreclosure abuses, and was fined $16.65B by the DOJ in 2014 for mortgage fraud. In Q4 2022, regulators imposed a $225M penalty for mishandling unemployment benefits during COVID-19.

Lastly, Wells Fargo has faced major legal challenges over the past decade. In 2012, as part of the National Mortgage Settlement, the bank agreed to a $5.4 billion settlement to address allegations of improper foreclosure practices. In 2016, its fraudulent account scandal led to a $185M CFPB fine, followed by the Federal Reserve's 2017 asset cap. In December 2022, the CFPB imposed a $3.7B fine for consumer protection violations. In mid to late 2022, Wells Fargo faced a securities class action lawsuit (*SEB Investment Management AB v. Wells Fargo*) over allegations that it misled investors about its diversity hiring practices. These key legal events, captured in the lower panel of the Figure, corroborate that legal risk is effectively reflected in earnings conference calls.

# 4 The Pricing Impact of Legal Risk

## 4.1 Portfolio Construction and Asset Pricing Results

I assess the economic value of legal risk exposure by computing value-weighted calendar-time portfolio returns. To reduce biases inherent in word frequency-based classifications, I sort firms into terciles—rather than quintiles or deciles—based on an ex-ante legal risk measure. This mitigates distortion from disclosure practices: firms with strong compliance may mention legal terms more often, while others with high latent risk may disclose less. Grouping into terciles smooths these extremes and provides a more reliable categorization of legal risk exposure.

Following Florackis et al. (2023), portfolio 1 consists of firms with no legal risk disclosures in their earnings call transcripts, allowing me to explore the extensive margin of legal risk exposure. The remaining firms—those with positive legal risk mentions—are split into portfolios 2 and 3 based on the median value of the legal risk exposure metric. To ensure comparability with other well-established asset pricing anomalies, I construct portfolios

at the end of each June, starting in June 2004. Stocks are weighted by their market capitalization as of the formation date, and the legal risk portfolios are rebalanced annually.[11]

Evaluating legal risk based on the past year, rather than solely the previous quarter, provides a more comprehensive and robust measure for several reasons. The existing literature presents a nuanced view of how firms disclose bad news. On one hand, Skinner (1994) argue that firms facing significant negative earnings news often voluntarily issue warnings to mitigate legal liability. On the other hand, deHaan et al. (2015) demonstrate that managers may strategically time the disclosure of bad news during periods of lower market attention, such as after trading hours or on busy reporting days. This complex interplay suggests that bad news related to legal risk may not always be immediately evident in earnings calls, as its disclosure may be influenced by strategic timing decisions. Moreover, firms frequently prioritize other pressing topics in earnings calls, causing litigation risks to emerge only after one or two quarters. By aggregating transcripts from the past four quarters, I account for these timing nuances and capture legal risks that may be disclosed in a less predictable manner, thereby providing a more accurate and holistic assessment of a firm's legal risk exposure.

To reflect this approach, I adopt what I term the (12-12) strategy, which uses information from the past 12 months (four quarters) to construct a portfolio held for the subsequent 12 months. As shown in Online Appendix D, alternative strategies such as (12-3), (12-6), and (6-6) yield quantitatively similar results, underscoring the robustness of the findings. Consistent with existing literature on cross-sectional anomalies, I exclude utility firms (SIC 4900–4999) and financial firms (SIC 6000–6411, SIC 6500–6553, and SIC 6700–6799) from the portfolio construction. These exclusions account for the distinct regulatory environments and business models of these sectors. Notably, utility firms tend to report a higher frequency of legal-related terms—for example, when ranking firms by total legal risk exposure over the full sample, utility firms comprise nearly half of the top 100 (unreported). While including these industries does not materially affect the main results, their exclusion ensures consistency with prior studies and enhances comparability.

[11] While earnings call transcripts are available starting in 2002, their widespread adoption began in 2003. Given that I follow the standard strategy of forming rebalancing portfolios using information from the prior year, and require at least one year of formation data (with longer periods used for robustness checks), the portfolio analysis begins in July 2004. I focus on value-weighted portfolios because legal consequences are generally more pronounced for larger firms. Smaller or micro-cap stocks may show higher legal risk exposure, but their overall economic impact is typically limited due to their size. In contrast, larger firms face greater regulatory scrutiny and legal liabilities, making them more consequential for the current analysis. Additionally, earnings call transcripts are often unavailable for smaller firms, further supporting the focus on larger, more economically significant firms.

[ INSERT TABLE 3 HERE ]

Table 3 presents the results, with portfolio returns starting from July 2004, as the analysis requires data from the prior four quarters of earnings conference calls. In the baseline analysis, average excess returns increase from 0.638% to 1.035% per month between no and high legal risk stocks in value-weighted portfolios. The corresponding long-short portfolio (L3 - L1) generates average return difference of 40 basis points per month (0.397% per month, or 4.7% per annum), with a Newey-West adjusted t-statistic of 3.66.[12] This strong cross-sectional relationship between legal risk and future stock returns is notable, especially considering that existing literature has not documented such a connection. The premium associated with firms exposed to legal risk is economically significant, with the LAW factor exhibiting an annual Sharpe ratio of 0.713 over the sample period from July 2004 to June 2024. Over the same period, the annual Sharpe ratios of other standard asset pricing factors, ordered by performance, are: RMW (0.672), MKT (0.621), MOM (0.077), CMA (0.007), SMB (–0.027), and HML (–0.082).

Next, I examine whether existing asset pricing models account for the legal risk factor. The factor spanning tests presented in the same table indicate that the legal risk factor remains significant across various models, including the CAPM, Fama-French three-factor model, Fama-French three-factor model with momentum, Fama-French three-factor model with liquidity, and the q-factor model. The annualized alpha results suggest that a zero-cost portfolio on legal risk earns an abnormal return of 0.439% per month (5.2% per annum) when benchmarked against the CAPM. Similar results hold when using other asset pricing models, such as the Fama-French three-factor model and the q-factor model. To summarize, legal risk remains unexplained by standard asset pricing models, representing a distinct and priced source of systematic risk.

In Panel B of the same table, I demonstrate that firms generally exhibit balanced characteristics across portfolios. Firms with no exposure to legal risk tend to be smaller compared to those with some degree of legal risk. This is consistent with the previous literature that deep pockets are associated with legal risk (DuCharme et al. 2004). Finally, Panel C documents the frequency of firms positioned in each tercile. On average, 38% of companies that had no previous experience with legal risk saw a rise in their exposure within the subsequent year. Interestingly, around 33% of companies previously at the highest levels of legal risk also transitioned to other terciles. Overall, the transition matrix exercise

[12] I use 6 lags; the results remain consistent when using 3, 9, or 12 lags, and the implications remain unchanged.

helps alleviate concerns about certain firms consistently having higher or lower exposure to legal risk.

## 4.2 Time-variation of Aggregate Legal Risk

[ INSERT FIGURE 7 HERE ]

How does legal risk change over time? This section tracks fluctuations in aggregate legal risk and discusses their broader implications. The measure is constructed each quarter by classifying firms into two groups: zero firms, which did not mention legal risk in any of the past four quarterly earnings call transcripts, and non-zero firms, which did. The coverage ratio, defined as the proportion of non-zero legal risk firms relative to all firms, captures the extensive margin of legal risk in the corporate sector.

The aggregate measure of legal risk, presented in Figure 7, exhibits notable time variation that aligns with major regulatory developments. Between 2003 and 2007, aggregate legal risk trended upward, as reflected in the standardized coverage ratio. This period was characterized by both regulatory tightening and deregulatory pressures. On balance, however, legal risk awareness increased.[13]

Following the Global Financial Crisis (GFC), the legal landscape shifted decisively toward greater regulatory scrutiny. Key reforms—including the Dodd-Frank Act's whistleblower provisions and the SEC's intensified enforcement activities—increased firms' exposure to legal oversight. As a result, aggregate legal risk remained elevated throughout the immediate post-crisis years.

By 2012–2013, however, the measure briefly subsided—possibly reflecting regulatory adjustment. However, this dip proved short-lived. From 2018 onward, legal risk began to rise again, reflecting structural developments such as the Supreme Court's *Cyan (2018)* ruling, which facilitated forum shopping in securities class actions, and the growing legal salience of cybersecurity threats. As Jamilov et al. (2025) note, evolving SEC disclosure rules and a wave of high-profile cyber incidents after 2015 have also contributed to heightened legal

[13]On one hand, the Sarbanes-Oxley Act (SOX) of 2002 introduced stricter compliance requirements, heightened board accountability, and imposed heavier penalties for misconduct, encouraging more proactive legal disclosures. On the other hand, deregulatory measures such as the Gramm-Leach-Bliley Act (GLBA) of 1999 and the adoption of Universal Demand (UD) laws reduced firms' exposure to shareholder litigation. Nonetheless, the post-SOX compliance shift appears to have had the stronger effect.

exposure—particularly in data-sensitive sectors. The COVID-19 shock further amplified aggregate legal risk. A multiple structural change procedure of Bai and Perron (2003) identify four statistically significant breakpoints: December 2007, March 2013, June 2017, and June 2020, which closely aligns with the major regulatory, legal, and macroeconomic shifts described above. In Online Appendix Figure A.1, I show that the aggregate measure of legal risk developed here does not coincide with well-known uncertainty measures such as Economic Policy Uncertainty (Baker et al. 2016) and Macroeconomic Uncertainty (Jurado et al. 2015), highlighting that LRISK represents a unique source of variance.

[ INSERT FIGURE 8 HERE ]

This transformation in the U.S. legal environment is also reflected in the cumulative returns shown in Figure 8, which plots the performance of a $1 investment in a long-short portfolio based on firms' legal risk exposure (LAW), alongside standard asset pricing factors. The graph highlights two notable inflection points. First, the 2018 surge in the LAW factor aligns with the Supreme Court's *Cyan, Inc. v. Beaver County Employees Retirement Fund* decision, which allowed class-action lawsuits under the Securities Act of 1933 to proceed in state courts. This ruling significantly increased the risk of forum shopping, exposing public firms to overlapping jurisdictions, elevated legal costs, and prolonged litigation. Second, the 2020 spike corresponds to the onset of the COVID-19 pandemic, which amplified legal uncertainty across sectors as firms faced heightened risk of regulatory enforcement, workforce disputes, and contractual disruptions. As a result, a $1 investment in the LAW portfolio would have grown to $2.38 over the period. In contrast, during the same timeframe, a $1 investment in the SMB, HML, and MOM portfolios would have declined to $0.91, $0.78, and $0.97, respectively.[14]

Importantly, the LAW factor demonstrates resilience during economic downturns, including the 2008 Global Financial Crisis and the 2020 COVID shock. Legal risks become particularly salient in these periods, as firms and investors are already under financial stress. Investors tend to value firms whose legal risk remains stable—or demand higher returns from those with greater exposure—driving the outperformance of the long-short strategy in downturns. This pattern is consistent with the predictions of the Law-CAPM model, which is contained in the Online Appendix C. By contrast, other risk factors, particularly momentum, tend to experience sharp declines during or shortly after recessions (Daniel

[14]My analysis further indicates that, individually, the q1 portfolio (comprising firms with no legal risk) would have grown from $1 to $3.23 by the end of the period, while the q2 (firms with medium legal risk) and q3 (firms with high legal risk) portfolios would have grown to $6.31 and $8.40, respectively.

and Moskowitz 2016).

[ INSERT TABLE 4 HERE ]

Table 4 presents the results of the portfolio exercise for the 2010–2024 subsample, a period characterized by post-GFC reforms that collectively increased the aggregate level of legal risk for all firms, reflecting a heightened focus on compliance and enforcement. Consistent with the time-varying nature of the aggregate legal risk environment, the long-short portfolio strategy achieves an even higher annual return of 7.1% (t-stat: 4.91) during this period, driven by the strong performance of the high legal risk portfolio. This outcome underscores the evolving legal landscape in the United States following the Global Financial Crisis. Notably, the enhanced performance of the long-short strategy arises from both sides of the portfolio. The Law-CAPM model predicts that, in a high legal risk environment, investors demand greater compensation for holding securities with elevated legal risk, which is reflected in the boosted performance of the long-side portfolio. Similarly, the model suggests that investors are willing to accept lower returns on stocks that are less exposed to legal risk, particularly those firms that do not disclose legal risks and are unlikely to face potential legal harm. This preference is reflected in the strongly negative performance of the short-side portfolio.

## 4.3 Legal Tail Risk

What is the source of the return premium on legal risk? This paper argues that it arises from firms with higher legal exposure carrying tail risk specific to legal incidents. Firms facing greater legal risk are more susceptible to large negative shocks, such as regulatory penalties, fines, and litigation costs, which can trigger sharp downward price movements. These adverse events create an uneven distribution of returns, with an increased likelihood of extreme losses. Investors, aware of this legal tail risk, demand higher expected returns as compensation for the heightened financial distress and uncertainty associated with these firms. This explains why legal risk is systematically priced in asset markets—firms with greater legal exposure must offer a return premium to account for the elevated probability of severe downside events.

One simple avenue to test this idea is to measure the ex-ante skewness on the returns of each portfolio, L1 (firms with no legal risk) and L3 (firms with high level of legal risk) and

compare their skewness. To conduct this, I follow Jondeau et al. (2019) in constructing the monthly standardized skewness of stock $i$ defined as

$$Sk_{i,t} = \sum_{d=1}^{D_t} \left( \frac{(r_{i,d} - \overline{r}_{i,t})}{\sigma_{i,t}} \right)^3 \tag{2}$$

where $r_{i,d}$ is the excess return of stock $i$ in day $d \in \{1, 2, ...D_t\}$, $\overline{r}_{i,t}$ is the average daily excess return of stock $i$ in month $t$, and $\sigma_{i,t} = \sum_{d=1}^{D_t} (r_{i,d} - \overline{r}_{i,t})^2$.

[ INSERT FIGURE 9 HERE ]

I compute the mean ex-ante skewness for both L1 (low legal risk) and L3 (high legal risk) portfolios and examine their differences. As expected, firms with high legal risk consistently exhibit significantly lower skewness than those with low legal risk across all sample years, as shown in Figure 9. The mean difference in skewness between the two portfolios over the full sample period is statistically significant at the 0.1% level (unreported). This finding underscores the link between legal risk and increased downside exposure, as firms facing legal uncertainty are more susceptible to large negative return shocks. Consequently, firms with higher legal risk exhibit return distributions with diminished positive skewness relative to their low-risk counterparts, reinforcing the notion that legal exposure contributes to a more asymmetric and riskier return profile.

From an investor's perspective, this result aligns with the Arrow-Pratt notion of risk aversion, which suggests that risk-averse investors dislike uncertainty, particularly when it manifests as downside risk. Since firms exposed to higher levels of legal risk are more likely to experience extreme losses, rational investors should prefer positively skewed portfolios (i.e., firms with low or no legal risk), all else being equal. The relatively lower skewness in firms with high legal risk further implies that investors demand a return premium to compensate for the asymmetric risk profile introduced by legal uncertainty. Importantly, while legal risk is associated with reduced skewness, it is not merely a proxy for skewness itself. Models in which time-varying risk premia arise from shocks to the volatility of macroeconomic fundamentals, captured by volatility-related risk factors such as co-skewness (Harvey and Siddique 2000), fail to explain the performance of the LAW factor. This indicates that legal risk captures distinct information beyond traditional measures of asymmetric return distribution.

# 5 Validation

This section compares the text-based legal risk exposure measure with existing firm-level text-based metrics to establish its distinct role in capturing legal risk-related components. It also rules out potential behavioral explanations. Finally, the section adopts a comparative economics perspective to examine how legal origins shape the pricing of legal risk, highlighting meaningful differences between common law and civil law systems.

## 5.1 Comparison with other text-based measures

***How the legal risk measure relates to the Loughran-McDonald measure:*** My work builds on the pioneering research of Loughran and McDonald (2011) (henceforth LM). While legal terms such as litigation and plaintiff appear in both the "Fin-Neg" and "Fin-Lit" categories proposed by LM, I tailor the approach to the spoken dynamics of earnings calls in two major ways, and these refinements provide a more precise and contextually relevant measure of legal language in financial discourse.

Many keywords in LM's Fin-Lit dictionary are formal and specialized: they are terms that are more likely to be found in legal contracts or court rulings rather than in real-time corporate discussions. To illustrate this distinction, consider a few examples. The LM dictionary includes complex legal terms such as *"appurtenance"* (referring to a right, privilege, or improvement associated with a piece of property) and *"conveniens"* (derived from *forum non conveniens*, a legal doctrine that determines the most appropriate or convenient forum for a case). While these terms may be useful in legal scholarship, they are unlikely to appear in earnings calls, where executives communicate in a more accessible and practical manner. Similarly, complex legal verbs such as *"exculpate"*, *"indemnify"*, and *"usurp"* are rarely used in corporate discussions and thus are excluded from the legal dictionary.

Furthermore, my methodology highlights the importance of bigrams (or trigrams) over unigrams in analyzing legal language. While both the LM dictionary and my legal dictionary include unigrams such as antitrust, lawsuit, litigation, plaintiff, prosecutor, and settlement (all of which clearly signal legal risks associated with a firm), many legal terms related to judicial entities, legal proceedings, and legal concepts (the three broad categories in the keyword library) are often overlooked when relying solely on unigrams. For instance, mentioning the term *"Department of Justice"* during earnings calls may suggest potential regulatory scrutiny or legal challenges related to a firm's future operations.

However, a unigram-based analysis would fail to capture the phrase in its entirety, missing the broader legal context it conveys. Additionally, relying solely on unigrams can lead to misinterpretation, as they may fail to distinguish between a positive statement about a valuable *"patent"* and a legal concern involving *"patent infringement,"* thereby distorting the assessment of legal risk.[15] To conclude, these two key refinements enhance the ability to measure legal risk more effectively, contributing to the pricing of legal risk in this work, in contrast to prior studies.[16]

[ INSERT TABLE 5 HERE ]

***How the legal risk measure relates to the Political Risk Measure:*** In a related study, Hassan et al. (2019) construct several text-based measures of risk exposure, including political risk (**PRISK**), non-political risk (**NPRISK**), and overall risk (**RISK**), each accompanied by a corresponding sentiment measure: **PSENT** (political sentiment), **NPSENT** (non-political sentiment), and **SENT** (overall sentiment).

To assess whether **LRISK** captures a unique dimension of legal risk, I compute its correlation with these related measures, presenting the results in Table 5. First, I find that the composite measure **LRISK** is highly correlated with its key components, **LRISK_COURT** and **LRISK_TRIAL**, with correlations between 0.80 and 0.90 (**LRISK_TERMS**, which includes general legal phrases such as "legal costs" and "legal dimension", exhibits more modest correlations). Most importantly, **LRISK** and its components show low correlations with other text-based risk measures, reinforcing that my legal risk metric captures a distinct legal dimension that firms face in the market.

***How the legal risk measure relates to the Cyber Risk measure:*** In a series of recent works, researchers have developed firm-level measures of cyber risk to assess its impact on financial markets. Florackis et al. (2023) analyze 10-K filings, Jiang et al. (2024) use machine learning techniques on firm characteristics, and Jamilov et al. (2025) apply natural language processing to earnings calls to construct firm-level cyber risk measures and assess their financial impacts.

[15] For a related discussion on the advantages of using bigram or trigram approaches over unigrams, see Caldara and Iacoviello (2022).

[16] On page 55 of Loughran and McDonald (2011), the authors document that a calendar-time portfolio strategy based on negative words ("Fin-Neg") does not generate significant abnormal returns: *"We calculate the Fama and French (1993) four-factor portfolio returns generated by taking a long position in stocks with a low negative word count and a short position in stocks with a high negative count.* [...] [*N*]*one of the* [*alpha*] *values are statistically significant. Hence, after controlling for various factors, the relation between 1-year returns and negative word counts is not enough to warrant active trading by investors."* Similarly, Loughran and McDonald (2013) find that legal word lists are not significantly associated with first-day IPO returns.

I compare the legal risk measure with the cyber risk measure developed by Jamilov et al. (2025). Since both measures are derived from the same textual source (earnings call transcripts), their cyber risk search terms serve as a natural benchmark for my study. Specifically, I construct a cyber risk dictionary, $\mathbb{C}$, based on Table 2 of Jamilov et al. (2025), along with a law-specific cyber risk dictionary $\mathbb{C}_{\text{LAW}}$ to obtain **Cyber Risk** and **Cyber Risk Law**, respectively.

[ INSERT TABLE 6 HERE ]

First, I observe that **LRISK** has essentially no correlation with **Cyber Risk** but exhibits a modest correlation of 0.42 with **Cyber Risk Law**, as shown in Panel A of Table 6. This result is expected, as cyber risk and legal risk capture distinct dimensions. In the Online Appendix G, I also provide firm-level evidence using SolarWinds, which was the target of major cyberattacks, to illustrate that legal risk exposure and cyber risk exposure represent separate aspects of risk.

The legal components of cyber risk, represented by **Cyber Risk Law**, share many common keywords—such as bankruptcy court, lawsuit, legal claim, and plaintiff—which naturally explains this correlation. In Panel B of the same table, I implement a long-short portfolio strategy, as documented in Section 4, and find that both **LRISK** (replicating the results from Table 3) and **Cyber Risk** are priced, whereas **Cyber Risk Law** is not. The pricing of **Cyber Risk** independently affirms the findings of Florackis et al. (2023) and Jiang et al. (2024) that cybersecurity matter is a priced source of risk.

Importantly, Panel C presents the results of a factor spanning test, where the **LAW** factor (constructed from firms' exposure to **LRISK**) explains both factors constructed from **Cyber Risk** and **Cyber Risk Law**. Crucially, it is not subsumed by the presence of these measures under the Fama-French three-factor model augmented with momentum. Equation (1) shows that the legal risk factor loads positively on both **Cyber Risk** and **Cyber Risk Law**, yet remains distinct and not fully captured by these factors. Conversely, Equations (2) and (3) in the same panel demonstrate that the presence of the law factor (**LRISK**) not only loads positively on **Cyber Risk** and **Cyber Risk Law** as expected, but also subsumes these factors. Given that cyber risk is a type of operational risk (Kamiya et al. 2021), which in turn is a sub-component of legal risk, it follows that legal risk is a broader concept and thus encompasses the effects of cyber risk.

[ INSERT FIGURE 10 HERE ]

In addition to the above findings that legal risk is distinct from both political risk and cyber risk, Figure 10 further underscores the uniqueness of the legal risk factor (**LAW**) within the broader factor zoo. Specifically, I examine the correlation between **LAW** and the full set of 196 anomalies with complete data that align with the legal risk factor's sample period (July 2004 to June 2023; the anomaly data is sourced from Chen and Zimmermann 2022). The results indicate that none of these anomalies exhibit an absolute Pearson correlation greater than 0.4, underscoring that the legal risk factor constructed in this paper is a distinct and significant driver of cross-sectional variation in stock returns.[17] Finally, as demonstrated in the case studies, legal risk is closely linked to both environmental concerns and the banking sector. Moreover, I confirm that the LAW factor is not explained by ESG factors (Pastor et al. (2022) and Pedersen et al. (2021); Table B.4 in the Online Appendix) and subsumes the bank size factor (Gandhi and Lustig 2015; unreported), reinforcing the argument that the LAW factor has a broader scope.

## 5.2 Behavioral Explanations?

One potential concern is that the observed legal risk premium may reflect behavioral biases rather than compensation for systematic risk. However, my empirical analyses point against this interpretation.

Stambaugh et al. (2012) argue that anomaly returns are significantly influenced by investor sentiment—particularly that short-leg returns are lower and long-short spreads narrower following high-sentiment periods, consistent with mispricing and limits to arbitrage. In contrast, I find that neither the long-leg, short-leg, nor long-short portfolio returns of the LAW factor exhibit sensitivity to market-wide sentiment, as measured by Huang et al. (2015). This suggests that the LAW premium is unlikely to be driven by sentiment-induced mispricing. Moreover, I show that existing behavioral and mispricing-based factors—such as PEAD and FIN from Daniel et al. (2020), and MGMT and PERF from Stambaugh (2017)—are unable to subsume the LAW factor. Even after controlling for the aggregate disagreement index proposed by Huang et al. (2021), which captures belief dispersion by aggregating 24 individual disagreement measures using a partial least squares (PLS) method, the alpha on LAW remains economically large and statistically significant. These findings, presented in Table B.2 in the Online Appendix, suggest that

[17] A similar judgment rule based on Pearson correlation is used in Birru et al. (2024). Additionally, I find that the correlations between **LAW** and other well-known factors are as follows: **MKT** (-0.14), **SMB** (-0.26), **HML** (-0.19), **MOM** (0.25), **RMW** (0.10), **CMA** (0.04), and **LIQ** (-0.02).

legal risk, as captured by the LAW factor, is unrelated to sentiment, mispricing, or belief heterogeneity as proxied by analyst disagreement.

Furthermore, if the returns to the LAW factor are primarily driven by mispricing linked to investor mood, as suggested by Birru (2018), then the LAW factor should exhibit stronger returns on Fridays.[18] However, my empirical results in Table B.3 in the Online Appendix indicate the opposite pattern: LAW returns are significantly positive on Mondays, with no statistically significant improvement on Fridays.

Finally, if the return premium on legal risk were purely driven by mispricing or behavioral biases, one would not expect firms to alter their real economic decisions in response. However, the evidence to be presented in the next Section shows that firms internalize legal risk as real and costly. These real effects reinforce the interpretation that legal risk is a priced source of systematic risk, rather than a behavioral anomaly.

## 5.3 Legal Origins and the Cross-Country Pricing of Legal Risk

Legal systems around the world broadly fall into two traditions: common law, as seen in the United States, and civil law, as found in countries like Germany and France. Common law systems emphasize judicial precedent, decentralized adjudication, and strong private enforcement mechanisms, including class actions and broad discovery rights. In contrast, civil law systems rely heavily on codified statutes, state-controlled judges, and limited private litigation avenues, with a greater emphasis on public enforcement. As a result, firms in common law countries tend to face more frequent and visible legal disputes, while those in civil law systems often operate under stricter procedural rules and more bureaucratic forms of legal accountability.

This institutional divergence has implications for how legal risk is perceived and priced in financial markets. Drawing on Glaeser and Shleifer (2002), the civil law tradition developed as a way to protect state-controlled judges from local coercion, often at the cost of legal flexibility and transparency. Unlike the U.S., where independent juries and private lawsuits can produce large, uncertain outcomes (i.e., legal tail risk), France and Germany

[18] Birru (2018) documents that investor mood improves throughout the week, leading speculative stocks to outperform on Fridays when mood is highest. Applying this framework, if high legal risk firms represent the speculative leg—given that lawsuits, regulatory actions, and litigation outcomes introduce significant uncertainty into their future cash flows and valuations, making them more difficult to price and more sensitive to shifts in investor sentiment—then LAW returns should be elevated at the end of the week.

channel disputes through formal and predictable procedures. Furthermore, as La Porta et al. (1998) and Djankov et al. (2003) show, civil law countries generally offer weaker investor protection, making it harder for shareholders to sue or extract information about pending legal exposure. These factors—less uncertainty, reduced disclosure, and lower shareholder litigation intensity—diminish both the visibility and materiality of legal risk to outside investors, potentially muting its impact on asset prices.

Consistent with these institutional differences, my empirical results show that legal risk is priced in the United States, but not in civil law countries such as Germany or France (results are unreported but available upon request). In these civil law countries, legal risk does not appear to be a salient dimension of priced risk in cross-sectional stock returns. This finding supports the view that differences in legal origin and enforcement structures shape how legal risk enters into firm valuation, and that legal risk may simply not be priced in countries where it is procedurally muted and economically less consequential.

# 6 The Economic Impact of Legal Risk

Firms facing heightened uncertainty about future conditions often respond by reducing or deferring investment, particularly in long-term or hard-to-reverse projects. When the future operating environment is unclear, committing capital becomes more costly and risk-laden, leading firms to adopt more cautious investment strategies. One increasingly salient source of uncertainty is legal risk, which adds complexity to the firm's strategic and financial planning. Legal uncertainty raises perceived risk among investors, prompting them to demand higher expected returns. This increases the firm's cost of equity capital (consistent with the idea that legal risk is priced in financial markets in the previous section) and makes external financing more expensive. As a result, firms facing elevated legal risk may scale back investment, postpone innovation, or reallocate resources toward compliance and risk management.

[ INSERT TABLE 7 HERE ]

To empirically assess the relationship between investment and legal risk at the firm level, I estimate

$$\text{INV}_{i,t+1} = \alpha + \beta\ \text{LRISK}_{i,t} + \gamma\ \mathbf{X}_{i,t} + \theta_i + \eta_t + \delta_{s(i)} + \varepsilon_{i,t+1} \tag{3}$$

where $\text{INV}_{i,t}$ denotes investment for firm $i$ at year $t$, $\text{LRISK}_{i,t}$ represents firm-level legal risk exposure, measured as the average across all quarters within a given year. $\mathbf{X}_{i,t}$ is a vector of control variables. The terms $\theta_i$ and $\eta_t$ capture firm and year fixed effects, respectively. $\delta_{s(i)}$ denotes industry fixed effects, where $s(i)$ maps firm $i$ to its corresponding two-digit SIC industry. For the dependent variable, INV, I use four different measures of investment, each scaled by beginning-of-year total assets. CAPX + AQC captures tangible investment, including capital expenditures and acquisitions, reflecting the firm's spending on physical assets and M&A activity. R&D represents intangible investment, measuring expenditures related to innovation, product development, and technological advancement. To capture both tangible and intangible investment in a single measure, I include $\Delta$ AT, defined as the annual change in total assets, and total investment, which aggregates capital expenditures, acquisitions, and R&D (See Table 7 for details). These broader measures provide a more comprehensive view of the firm's overall investment activity. For ease of interpretation, investment variables are expressed in percentage terms, and legal risk is standardized.

[ INSERT TABLE 8 HERE ]

Table 8 presents the results. Across four distinct measures of firm-level investment (including both tangible and intangible assets), all regressions reveal a consistent pattern: higher legal risk significantly predicts lower future investment. For economic interpretation, consider column (2), where the dependent variable is tangible investment, defined as the sum of capital expenditures (CAPX) and acquisitions (AQC). A one standard deviation increase in legal risk is associated with an approximate 3% decline in tangible investment in the following year.[19]

The effect is even more pronounced when focusing on intangible investment. Column (8) reports results using R&D expenditures as the dependent variable, showing that a one standard deviation increase in legal risk is associated with an estimated 7.8% decline in R&D investment in the subsequent year.[20] Finally, when aggregating across all investment types—including CAPX, acquisitions, R&D, and the change in intangible assets—the results remain consistent. Column (11) shows that a one standard deviation increase in legal risk predicts a 7.0% reduction ($-1.233/17.75 \approx -6.94\%$) in total firm-level investment, underscoring the broader economic impact of legal uncertainty on corporate investment

[19] The sample mean of tangible investment (CAPX + AQC) is 8.45, implying an economic effect of $-0.267/8.45 \approx -3.16\%$.

[20] The sample mean of R&D investment (xrd) is 5.92, implying an economic effect of $-0.463/5.92 \approx -7.82\%$.

behavior. These empirical results are consistent with the notion that legal risk introduces uncertainty about the future operating environment, prompting firms to adopt more cautious investment behavior. Faced with elevated legal uncertainty, firms appear to scale back or delay investment to avoid committing capital under conditions of heightened risk.

To further examine the economic consequences of legal risk, I assess whether it also affects the mode of financing. Following Malmendier et al. (2011), I estimate the following regression:

$$\text{Debt}_{i,t} = \alpha + \beta_1 \text{ FD}_{i,t} + \beta_2 \text{ LRISK}_{i,t} + \beta_3 \left(\text{FD}_{i,t} \times \text{LRISK}_{i,t}\right) + \gamma \, \mathbf{X}_{i,t} + \theta_i + \eta_t + \varepsilon_{i,t} \quad (4)$$

In this specification, $\text{Debt}_{i,t}$ denotes net debt issuance for firm $i$ in year $t$. The variable $\text{FD}_{i,t}$ captures the financing deficit, defined following Frank and Goyal (2003), and measures the extent to which a firm's expenditures exceed its internal funds and thus necessitating external financing. The coefficient of interest is $\beta_3$, which captures the interaction between the financing deficit and legal risk (FD $\times$ LRISK), and tests whether legal uncertainty moderates the firm's reliance on debt financing when internal resources are insufficient.

[ INSERT TABLE 9 HERE ]

Table 9 presents strong evidence that legal risk systematically shapes corporate financing behavior, particularly when firms face a financing deficit (FD). To start with, across all model specifications, the coefficient on FD is consistently positive and highly significant, including in the baseline model in Column (1). This indicates that, in general, firms respond to funding shortfalls by raising debt, in line with traditional pecking-order theory: when internal funds are insufficient, firms first turn to debt markets before issuing equity. In contrast, LRISK is positive but statistically insignificant across all specifications. This suggests that legal risk on its own does not systematically increase or decrease a firm's propensity to issue debt when there are no pressing funding needs.

However, the story changes when we examine the interaction between legal risk and financing needs. The coefficient on the interaction term LRISK $\times$ FD, $\beta_3$, is consistently negative and statistically significant at the 1% level across all models. This implies that when firms do experience a financing deficit, those with higher legal risk are significantly less likely to meet their funding needs via debt issuance. In other words, legal uncertainty

introduces financing frictions that constrain debt capacity during periods of external funding demand. This effect is robust to the inclusion of controls for firm size, leverage, growth opportunities, and asset structure, as well as to firm, year, and industry fixed effects.[21]

This behavior is consistent with a precautionary financing motive: firms facing elevated legal risk avoid taking on fixed obligations such as debt when future cash flows are more uncertain or more vulnerable to downside shocks. Legal risk introduces significant uncertainty about potential future liabilities (e.g., lawsuits, regulatory fines, adverse rulings), which are often large, lumpy, and unpredictable. Unlike operating risk, these legal shocks are non-diversifiable and often correlated with firm-specific events that can trigger rapid changes in financial health or public scrutiny.

When a firm with high legal risk also faces a financing deficit, it finds itself in a constrained environment. Issuing debt under such conditions may be especially costly for two reasons. First, creditors may demand higher yields to compensate for the firm's increased tail risk and reduced transparency, pushing up the cost of capital. Second, debt issuance may reduce financial flexibility by introducing rigid repayment obligations at a time when future cash flow needs are hard to predict. This creates a risk of debt overhang or even financial distress if legal liabilities materialize—particularly when those liabilities are opaque, unquantifiable, or subject to long legal timelines.

Thus, high legal risk firms may intentionally scale back debt issuance in favor of preserving optionality. Rather than locking in fixed payments, these firms might prefer to rely more heavily on internal funds, delay investment, or consider more flexible financing options (such as equity or convertible debt, even at higher dilution costs). In this sense, the interaction effect (negative LRISK × FD) captures a strategic reluctance to lever up during periods of elevated uncertainty and funding pressure—highlighting the deep influence of legal risk on firms' dynamic capital structure decisions.

# 7 Conclusion

This paper identifies legal risk as a distinct, priced, and economically meaningful dimension of firm-level uncertainty. Using textual analysis of earnings call transcripts, I con-

[21] Importantly, when examining equity issuance as an alternative financing margin, the interaction between legal risk and financing deficit is statistically insignificant across all specifications (see Online Appendix Table B.5). This suggests that firms facing high legal risk do not substitute away from debt toward equity financing.

struct a firm-level measure of legal risk (**LRISK**) that captures forward-looking concerns related to litigation, regulatory scrutiny, and legal exposure. This measure offers a scalable and dynamic proxy that reflects how both firms and investors perceive legal uncertainty in real time.

At the firm-level, I show that higher legal risk is associated with significantly lower future investment (particularly in intangible assets) and reduced reliance on debt financing during periods of funding need. These findings suggest that legal risk acts as a friction in both capital allocation and financing decisions, consistent with a precautionary motive. At the aggregate-level, legal risk is robustly priced in the cross-section of stock returns. A long-short portfolio that buys high-legal-risk firms and sells no-risk firms earns an annualized return of 4.7% over the full sample (2004–2024), rising to 7.1% post-2010—a period characterized by intensified regulatory enforcement. The return premium is not explained by standard factor models, ESG proxies, sentiment measures, or existing anomaly variables. Further, the legal risk premium is closely tied to legal tail events, suggesting that investors demand compensation for downside risk uniquely associated with legal exposure. In comparative perspective, I show that legal risk is priced in common law countries—like the United States—but not in civil law systems such as France or Germany, where legal procedures are more codified and litigation risk less salient. This cross-country variation reinforces the idea that institutional foundations shape how markets perceive and price legal uncertainty.

Together, these findings establish legal risk as a first-order determinant of both firm behavior and expected returns. Understanding how legal systems contribute to firm-level risk, investor behavior, and capital market outcomes is central to the broader agenda of law and finance.

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# List of Figures

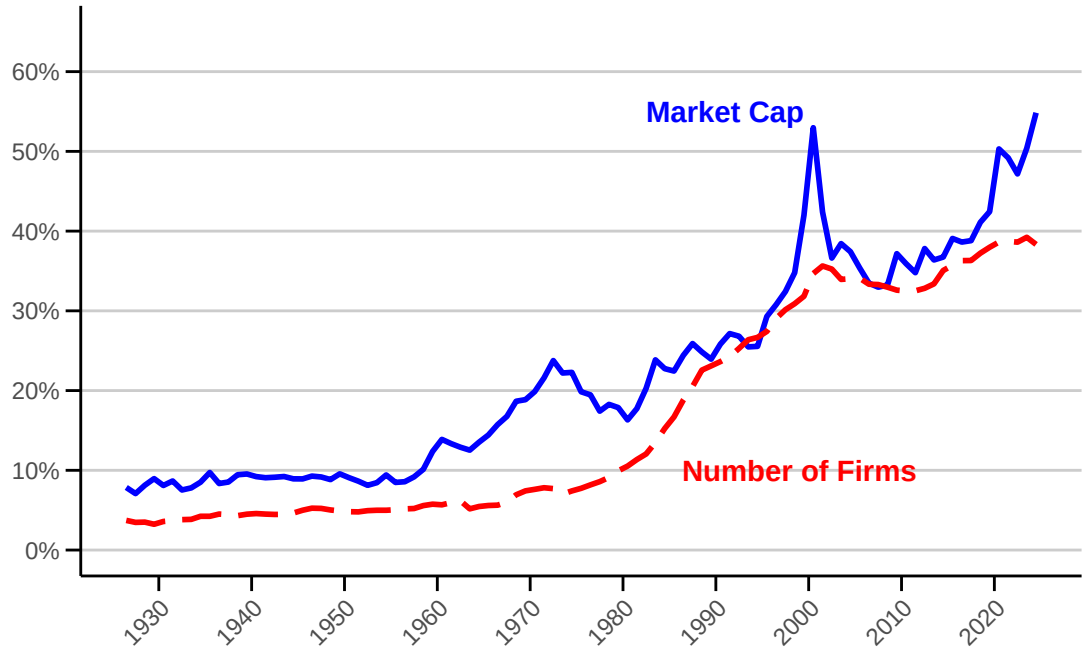



Figure 1: Growth of high litigation industries

**Note:** This figure illustrates the number of firms (red dotted line) and the market capitalization ratio (blue solid line) of companies operating in high-litigation industries, relative to all publicly traded firms on the NYSE, NASDAQ, and NYSE American (formerly AMEX) from 1926 to 2024. The industries prone to litigation include pharmaceuticals and biotechnology (SIC 2833 - 2836), computer and office equipment (SIC 3570 - 3577), software and IT services (SIC 7370 - 7374), and electronic and electrical equipment (SIC 3600 - 3674). These industries are frequently involved in litigation due to intellectual property disputes, regulatory challenges, and product liability risks.

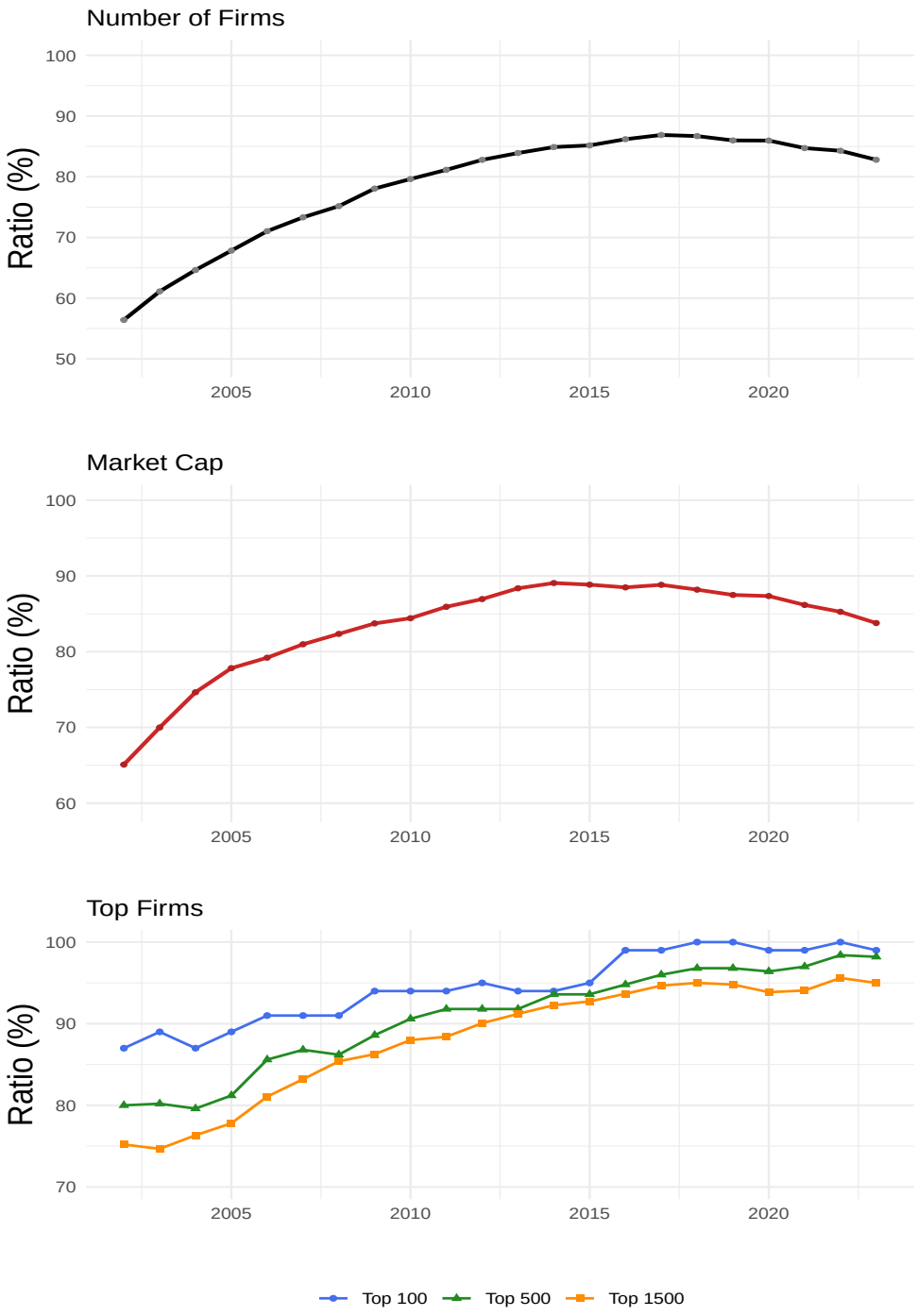



Figure 2: Summary statistic on U.S. firms publishing earnings calls transcripts

**Note:** The figures display the following: the proportion of firms publishing earnings call transcripts (top), the proportion of market capitalization of those firms that publish earnings calls (middle), and the proportion of the top 100, top 500, and top 1500 firms by market capitalization that publish earnings call transcripts (bottom). The ratio is calculated by dividing the number of relevant firms by the total number of firms listed on the three major U.S. stock exchanges—NYSE, NASDAQ, and NYSE American (formerly AMEX)—with ordinary shares (CRSP share codes 10 or 11).




Figure 3: Legal Exposure of Well-known Firms

**Note:** This figure illustrates the legal risk exposure of prominent corporate entities analyzed in this study. The x-axis shows the years over which portfolio sorting based on firm-level legal risk exposure was conducted, spanning from 2003 to 2023. The y-axis categorizes the legal risk into three levels: 1 indicates no legal risk, 2 represents moderate legal risk, and 3 denotes high legal risk.

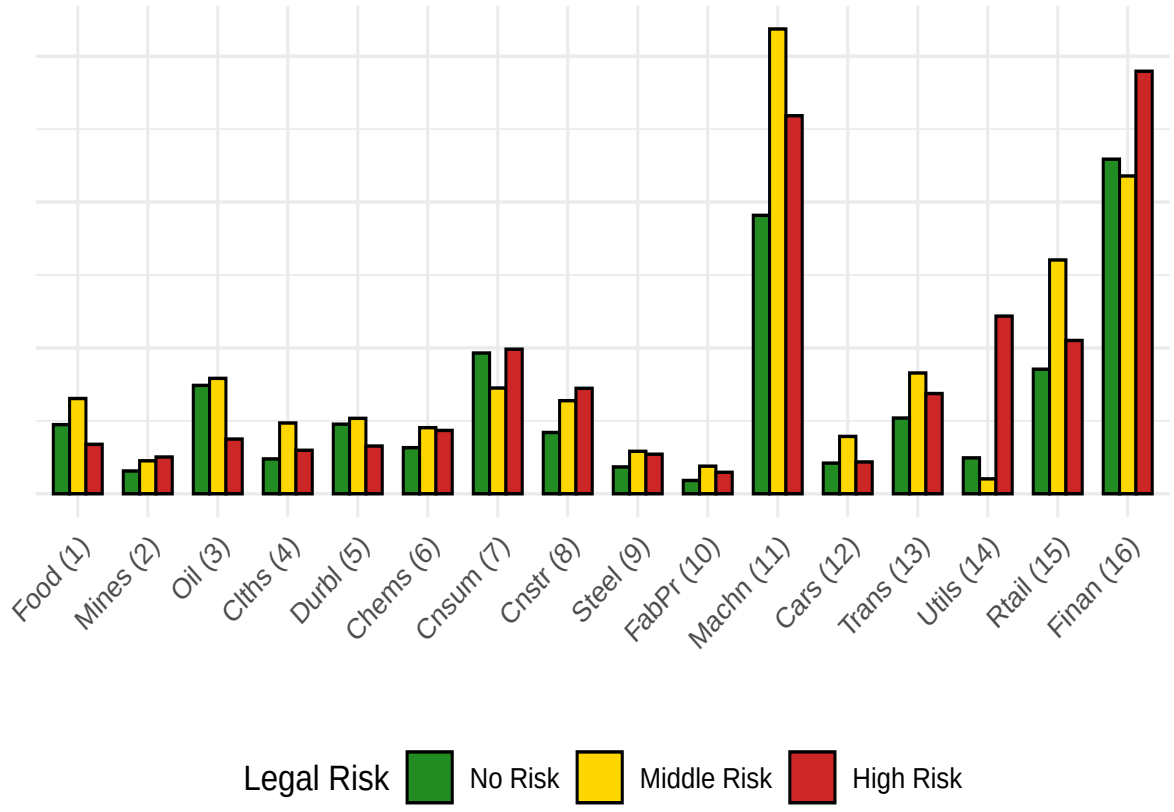



Figure 4: Industry Distribution of Legal Risk

**Note:** The figures illustrate the industry contributions to the tercile portfolios described in this paper. The x-axis represents the Fama-French 17 industry categories: Food (FF industry category 1), Mines (2), Oil (3), Clothes (4), Consumer Durables (5), Chemicals (6), Consumer goods (7), Construction (8), Steel (9), Fabricated Products (10), Machinery and Business Equipment (11), Cars (12), Transportation (13), Utilities (14), Retails (15), Finance (16) and Others (omitted). The y-axis displays the frequency of firm-month observations categorized into one of the three portfolio sorts based on legal risk exposure: green (No legal risk), yellow (Medium legal risk), and red (High legal risk).

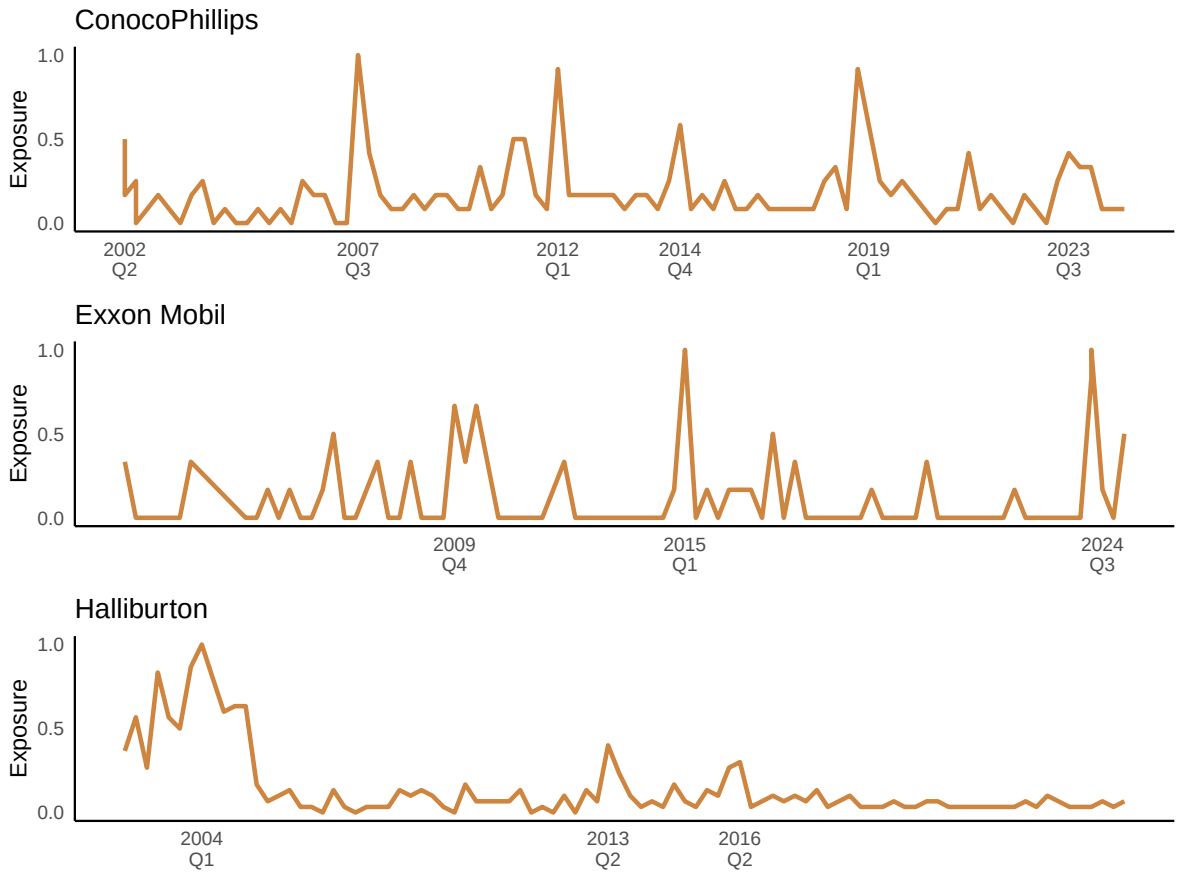



Figure 5: Case Studies: Brown Firms

**Note:** This figure illustrates the firm-level legal risk exposure of three representative companies in the oil industry: ConocoPhillips, ExxonMobil, and Halliburton. All three are constituents of the S&P 500. The brown solid line in each figure represents the standardized firm-level legal risk exposure, as measured from earnings call transcripts.




Figure 6: Case Studies: Bank Firms

**Note:** This figure illustrates the firm-level legal risk exposure of three representative companies in the banking industry: Citigroup, Bank of America, and Well Fargo. All three are constituents of the S&P 500. The purple solid line in each figure represents the standardized firm-level legal risk exposure, as measured from earnings call transcripts.

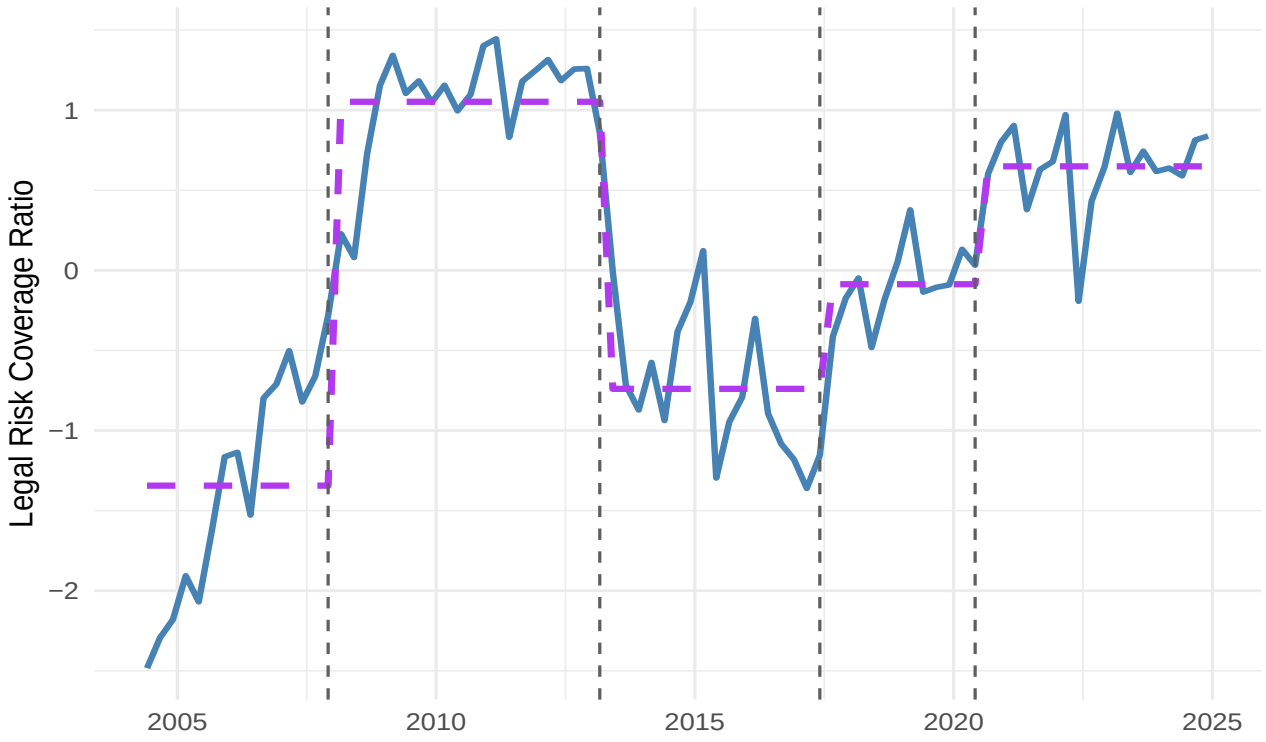



Figure 7: Aggregate Measure of Legal Risk

**Note:** This figure presents an aggregate measure of legal risk, captured by the coverage ratio of firms referencing legal risk. Each quarter, firms are classified into two groups: zero firms, defined as those that did not mention legal risk in their earnings call transcripts over the past four quarters, and non-zero firms, which did include such mentions. The coverage ratio is then calculated as the proportion of non-zero firms to the total number of firms. To facilitate comparison over time, this ratio is standardized using a z-score transformation, highlighting fluctuations relative to the historical average. The time series is further segmented using the **?** multiple structural break estimation procedure. Segment means between these breaks are plotted to visualize regime shifts in the underlying trend of legal risk coverage over time.

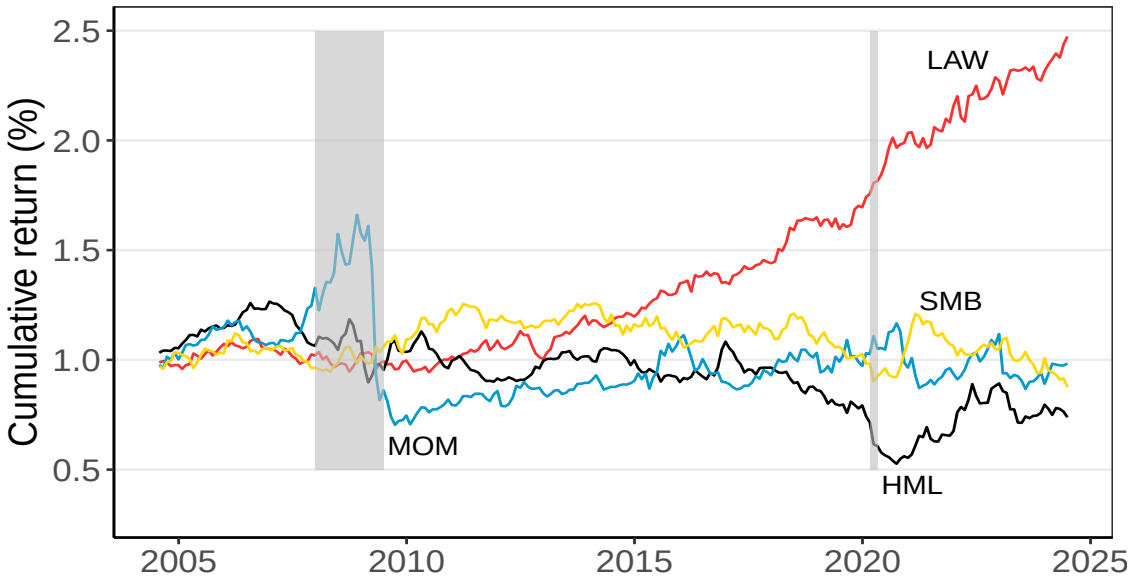



Figure 8: Cumulative Return Performance of Legal Risk Factor (LAW)

**Note:** This figure plots the cumulative return performance of $1 invested in each of the four risk factors (LAW, SMB, HML, and MOM) at the end of 2004:06. The legal risk factor is the long-short portfolio strategy returns created using tercile portfolio approach. SMB, HML, and MOM are standard asset pricing factors described in the finance literature. The shaded area are NBER economic recession periods.

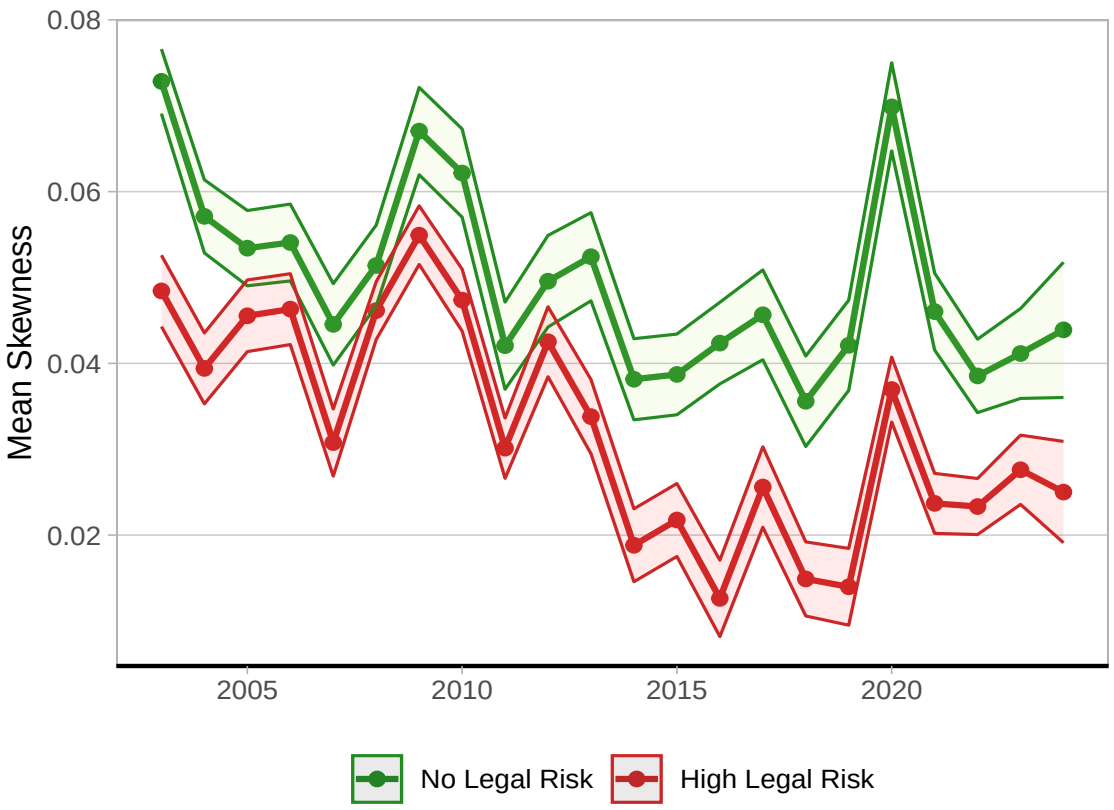



Figure 9: Ex-Ante Skewness of Legal Risk Portfolios

**Note:**This figure illustrates the ex-ante return skewness of two portfolios: P1 (firms with no legal risk, represented by the green solid line) and P3 (firms with high legal risk, represented by the red solid line). Return skewness is calculated using daily returns for each firm, which are then aggregated at the monthly level. The skewness values for P1 and P3 are averaged within their respective portfolios. The shaded regions are 95% Confidence Intervals.

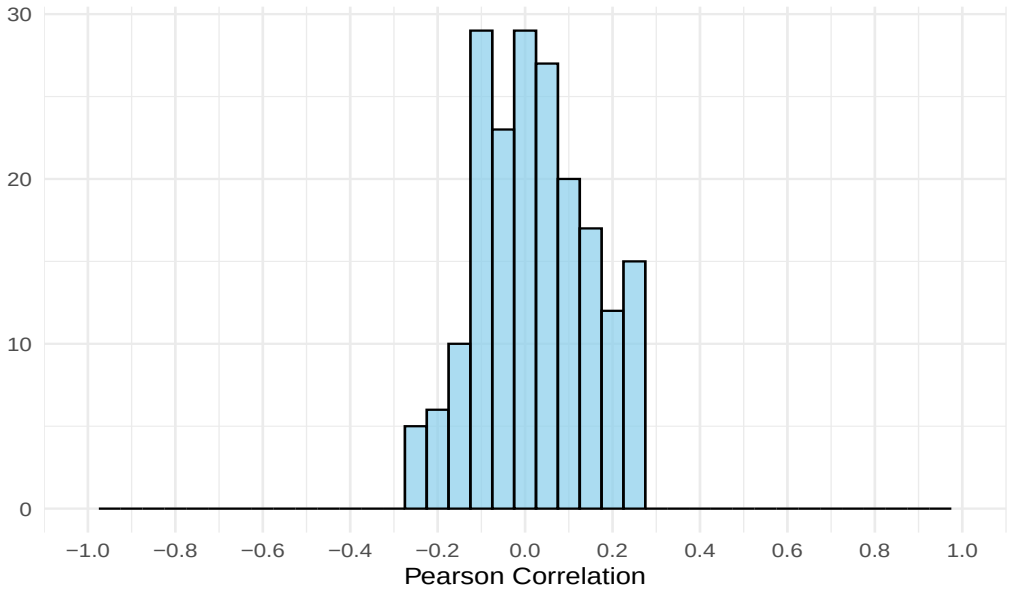



Figure 10: Risk factor correlation

**Note:** The figure displays a histogram of Pearson correlation coefficients between the legal risk factor ("LAW" factor) and 193 risk anomalies identified in the finance literature. The sample period spans from July 2004 to December 2023, based on the availability of the factor dataset. The x-axis represents the correlation coefficients (ranging from -1 to 1), while the y-axis shows the number of risk anomalies within each correlation bin.

# List of Tables

| No | Companies | Date | SIC | Texts |
|---|---|---|---|---|
| 1 | NV Energy Inc | Feb 10, 2003 | 4911 | The **lawsuit** filed *against* us in **Federal Bankruptcy Court** by Enron is an ongoing matter. |
| 2 | Metro International SA | Feb 13, 2007 | 2711 | However, over the years, the **case law** has developed and at the end of 2005, it became apparent that certain deductions could be challenged by the Swedish tax agency. |
| 3 | AngioDynamics Inc | July 24, 2007 | 3841 | Diomed's filing goes before the same **judge** who issued the injunction and the timing of any ruling is uncertain. |
| 4 | Associated Materials LLC | Nov 17, 2011 | 3089 | But in any event, they went to the same **lawyers** that were handling the first-**class action** suit, and in order to avoid an issue in commonality they set up a second suit against us. |
| 5 | Hong Kong Technology Venture Co Ltd | Nov 21, 2012 | 4813 | They won't be able to grant me a license of 2015 because, as I mentioned earlier, in order to protect our investor interest, if we don't get our license by end of the year we will seriously consider to raise the **judicial review** against the government and get a **court** to push the government to issue the license in a reasonable timeframe. |
| 6 | Odyssey Marin Exploration Inc | March 16, 2015 | 8732 | The **oral argument** for this final claim is scheduled for early May, that claim was dismissed at the **trial court** level and we expect the dismissal to be upheld. |
| 7 | ParkerVision Inc | November 14, 2016 | 3663 | It's also important to note that we filed last month an infringement case against Apple in Munich, citing the same patent as in the LG case, and we've just recently learned that the **hearing** for that case has been set for May 4, 2017, less than 6 months from now. |
| 8 | Digital Ally Inc | Apr 1, 2019 | 3663 | And quite frankly, we think even the **patent infringement** that we're seeing out there is becoming more and more brazen, not only with Axon and WatchGuard, who we have active **lawsuits** with, but we believe potentially even other competitors out there. |
| 9 | Johnson & Johnson | July 20, 2023 | 2834 | The **bankruptcy judge** is expected to rule by August 2 on the motion to dismiss hearing that took place in the last week of June. |
| 10 | Alphabet Inc | Oct 29, 2024 | 7370 | But it looks like the way that the Google versus **DOJ** search trial is going, there's a decent likelihood that the Apple ISA contract and some of the Android pre-install contracts are going to be voided at some point in the future |

Table 1: Examples of U.S. Firms mentioning Litigation-related terms in their Transcripts

**Note:** This table shows the corporate earnings calls transcripts of some U.S. companies that mention legal- or litigation-related terms. The bold red text indicates legal-related terms

| Categories | Key terms in this category |
|---|---|
| **Judicial Entities and Key Participants** (**LRISK_COURT**) | **Judicial Entities**: Bankruptcy Court, Department of Justice, Federal Circuit, Supreme Court, Trial Court, ...<br>**Key Participants**: Administrative Law Judge, Judges, Jury, Plaintiffs, Prosecutors, ... |
| **Legal Processes and Disputes** (**LRISK_TRIAL**) | **Legal Processes**: Appeals, Arbitration, Bankruptcy Proceeding, Class Action, Oral Argument, Trial Date, ...<br>**Legal Disputes**: Antitrust Case, Civil Litigation, Patent Infringement, ... |
| **Legal Terms and Concepts** (**LRISK_TERMS**) | Adverse Ruling, Case Law, Legal Costs, Sub Judice, ... |

Table 2: Word Choices to Measure Litigation Risk

**Note:** This table shows the list of legal terms contained in the legal dictionary $\mathbb{L}$. Broadly put, there are three distinct categories, terms related to (1) Judicial Entities and Key Participants; (2) Legal Processes and Disputes; and (3) Legal Terms and Concepts. Refer to the online appendix for the full list of keywords and word choices.

**Panel A: Value-weighted future excess returns (%)**

| | L1<br>No legal risk | L2<br>Middle legal risk | L3<br>High legal risk | L3 - L1<br>Long - Short |
|---|---|---|---|---|
| Excess return | 0.638 | 0.912 | 1.035 | **0.397*** ** |
| | (2.02) | (3.23) | (3.37) | **(3.66)** |
| CAPM alpha | -0.207 | 0.094 | 0.232 | **0.439*** ** |
| | (-2.17) | (1.50) | (3.79) | **(4.15)** |
| FF3 alpha | -0.193 | 0.084 | 0.205 | **0.398*** ** |
| | (-1.92) | (1.39) | (4.56) | **(3.87)** |
| FF3 + Mom alpha | -0.157 | 0.095 | 0.215 | **0.372*** ** |
| | (-1.67) | (1.62) | (4.89) | **(3.72)** |
| FF3 + Liquidity alpha | -0.198 | 0.100 | 0.195 | **0.392*** ** |
| | (-1.96) | (1.65) | (4.46) | **(3.81)** |
| FF5 alpha | -0.193 | 0.028 | 0.178 | **0.372*** ** |
| | (-1.88) | (0.536) | (3.79) | **(3.43)** |
| FF5 + Mom alpha | -0.162 | 0.037 | 0.189 | **0.351*** ** |
| | (-1.65) | (0.739) | (4.01) | **(3.31)** |
| q-factor alpha | -0.124 | 0.063 | 0.204 | **0.328** ** |
| | (-1.18) | (1.01) | (3.81) | **(2.96)** |

**Panel B: Firm characteristics**

| | L1<br>No legal risk | L2<br>Middle legal risk | L3<br>High legal risk |
|---|---|---|---|
| Num. of Firms | 701 | 895 | 895 |
| Market value (log) | 5.5 | 7.16 | 6.69 |
| Book-to-market ratio | 0.72 | 0.60 | 0.64 |
| Gross Profit | 0.23 | 0.32 | 0.31 |
| Investment | 0.33 | 0.26 | 0.29 |
| Momentum | 0.13 | 0.12 | 0.11 |
| Asset Tangibility | 0.20 | 0.22 | 0.19 |
| Long-term Debt / Total Liabilities | 0.27 | 0.33 | 0.30 |

**Panel C: Transition Matrix (% of firms moving from one portfolio to another)**

| | (to) L1 | (to) L2 | (to) L3 | Total |
|---|---|---|---|---|
| (from) L1 | 62.0 | 26.6 | 11.3 | 100 |
| (from) L2 | 17.8 | 53.8 | 28.4 | 100 |
| (from) L3 | 7.5 | 26.3 | 66.2 | 100 |

Table 3: Legal Risk Portfolio Results

**Note:** Panel A presents the average future excess returns (2004:07 - 2024:06) alongside the alpha results derived from portfolios constructed based on ex-ante legal risk measures. Firms in L1 (No legal risk) are those with no exposure to legal risk. Firms with non-zero exposure to legal risk are split into two groups, placed in L2 or L3 according to their level of exposure. The portfolio return data spans from July 2003 to December 2023. Utility firms (SIC codes 4900–4999) and financial firms (SIC codes 6000 - 6411, 6500 - 6553, and 6700 - 6799) are excluded due to the highly restrictive nature of government regulation. The numbers in parenthesis are Newey-West t-statistics with 6 lags. Panel B records the firm characteristics of companies analyzed in the portfolio analysis. Investment is defined as CAPX / PPENT; Asset tangibility is defined as PPENT / AT; Long-term Debt / Total Liabilities is defined as DLTT/ LT. Panel C shows the average transition probabilities. ***/**/* denote the statistical significance at 1%/5%/10% level.

**Post-2010 Result (%)**

| | P1<br>No legal risk | P2<br>Middle legal risk | P3<br>High legal risk | P3 - P1<br>Long - Short |
|---|---|---|---|---|
| Excess return | 0.841 | 1.173 | 1.434 | **0.593*** ** |
| | (2.91) | (4.47) | (5.12) | **(4.91)** |
| CAPM alpha | -0.371 | -0.013 | 0.282 | **0.653*** ** |
| | (-3.64) | (-0.21) | (3.93) | **(5.58)** |
| FF3 alpha | -0.370 | -0.027 | 0.0.236 | **0.606*** ** |
| | (-3.53) | (-0.432) | (4.91) | **(5.41)** |
| FF3 + Mom alpha | -0.319 | -0.001 | 0.244 | **0.563*** ** |
| | (-3.28) | (-0.023) | (4.96) | **(5.18)** |
| FF3 + Liquidity alpha | -0.374 | -0.015 | 0.212 | **0.587*** ** |
| | (-3.42) | (-0.24) | (4.57) | **(5.03)** |
| FF5 alpha | -0.339 | -0.057 | 0.212 | **0.551*** ** |
| | (-3.26) | (-1.00) | (4.16) | **(4.93)** |
| FF5 + Mom alpha | -0.292 | -0.034 | 0.223 | **0.515*** ** |
| | (-2.99) | (-0.60) | (4.30) | **(4.71)** |
| q-factor alpha | -0.280 | -0.046 | 0.230 | **0.509*** ** |
| | (-2.84) | (-0.68) | (3.99) | **(4.43)** |

Table 4: Post-2010 Results

**Note:** This table presents the average future excess returns alongside the alpha results derived from portfolios constructed based on ex-ante legal risk measures, spanning post-2010 sample (2010:07 - 2024:06). Firms in P1 (No litigation risk) are those with no exposure to legal risk. Firms with non-zero exposure to legal risk are split into two groups, placed in P2 or P3 according to their level of exposure. The portfolio return data spans from July 2003 to December 2023. Utility firms (SIC codes 4900–4999) and financial firms (SIC codes 6000 - 6411, 6500 - 6553, and 6700 - 6799) are excluded due to the highly restrictive nature of government regulation. The numbers in parenthesis are Newey-West t-statistics with 6 lags. ***/**/* denote the statistical significance at 1%/5%/10% level.

| | LRISK | LRISK_COURT | LRISK_TRIAL | LRISK_TERMS | PRISK | NPRISK | RISK | PSENT | NPSENT | SENT |
|---|---|---|---|---|---|---|---|---|---|---|
| **LRISK** | 1.00 | | | | | | | | | |
| **LRISK_COURT** | 0.80 | 1.00 | | | | | | | | |
| **LRISK_TRIAL** | 0.88 | 0.48 | 1.00 | | | | | | | |
| **LRISK_TERMS** | 0.44 | 0.20 | 0.29 | 1.00 | | | | | | |
| **PRISK** | 0.09 | 0.09 | 0.07 | 0.03 | 1.00 | | | | | |
| **NPRISK** | 0.05 | 0.04 | 0.03 | 0.03 | 0.19 | 1.00 | | | | |
| **RISK** | 0.08 | 0.08 | 0.06 | 0.03 | 0.47 | 0.49 | 1.00 | | | |
| **PSENT** | -0.15 | -0.13 | -0.14 | -0.09 | -0.07 | -0.09 | -0.14 | 1.00 | | |
| **NPSENT** | -0.10 | -0.08 | -0.07 | -0.08 | -0.06 | -0.04 | -0.09 | 0.30 | 1.00 | |
| **SENT** | -0.18 | -0.15 | -0.14 | -0.10 | -0.12 | -0.12 | -0.21 | 0.68 | 0.56 | 1.00 |

Table 5: Correlation between **LRISK** and other Text-based Firm-level Exposure Measures

**Note:** This table presents the Pearson correlation between **LRISK** and its three components—**LRISK_COURT**, **LRISK_TRIAL**, and **LRISK_TERMS**—alongside relevant text-based measures. Political and non-political risk, as well as sentiment measures, are sourced from Hassan et al. (2019). Correlations are computed at the aggregate level, though first grouping by firm or year before calculating correlations does not affect the main implications.

**Panel A: Correlation**

| | **LRISK (LAW)** | **Cyber Risk** | **Cyber Risk Law** |
|---|---|---|---|
| **LRISK (LAW)** | 1.00 | | |
| **Cyber RISK** | -0.05 | 1.00 | |
| **Cyber Risk Law** | 0.42 | -0.01 | 1.00 |

**Panel B: Risk Factor Performance**

| | **LRISK (LAW)** | **Cyber Risk** | **Cyber Risk Law** |
|---|---|---|---|
| Excess return | **0.397*** ** | **0.360** ** | 0.142 |
| (% per month) | **(3.66)** | **(2.05)** | (1.19) |
| FF5 + Mom alpha | **0.351*** ** | **0.275*** ** | 0.070 |
| (% per month) | **(3.31)** | **(2.25)** | (0.62) |

**Panel C: Factor Spanning Test**

| | (1) | (2) | (3) |
|---|---|---|---|
| → Dependent variable: | **LRISK (LAW)** | **Cyber Risk** | **Cyber Risk Law** |
| ↓ Independent variable: | | | |
| Intercept | **0.277*** ** | 0.164 | -0.093 |
| | **(2.85)** | (1.49) | (-0.96) |
| **LRISK (LAW)** | | **0.244** ** | **0.256** ** |
| | | **(2.24)** | **(2.16)** |
| **Cyber Risk** | **0.203** ** | | **0.361*** ** |
| | **(2.12)** | | **(5.24)** |
| **Cyber Risk Law** | **0.281** ** | **0.475*** ** | |
| | **(2.08)** | **(4.59)** | |
| MKT | 0.004 | 0.005 | 0.007 |
| | (0.14) | (0.21) | (0.29) |
| SMB | **-0.120** ** | -0.029 | 0.061 |
| | **(-2.56)** | (-0.53) | (1.37) |
| HML | 0.06 | **-0.353*** ** | 0.065 |
| | (1.10) | **(-5.68)** | (1.32) |
| MOM | **0.05*** | -0.002 | 0.041 |
| | **(1.70)** | (-0.04) | (1.44) |

Table 6: Comparing Legal Risk and Cyber Risk

**Note:** This table compares Legal Risk (**LRISK** or **LAW** factor) constructed in this paper with **Cyber Risk** and its component measure, **Cyber Risk Law**. All three measures are derived from earnings call transcripts, covering the sample period from 2004:07 to 2024:06. Panel A reports the Pearson correlation at the firm level. Panel B presents the performance of a long-short portfolio strategy over the sample period. Panel C shows the factor spanning test, where the dependent variable is one of the three measures, and the benchmark model is the Fama-French five-factor model augmented with momentum, as well as the two remaining measures not used as the dependent variable. In Panels B and C, numbers in parentheses represent Newey-West t-statistics with six lags. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Variable Definitions**

| Variable | Definition |
|---|---|
| *Legal Risk* | |
| LRISK | Standardized firm-level legal risk exposure, constructed as the annual average of quarterly textual exposure measures to legal risk from earnings calls, and standardized across all firm-year observations. |
| *Control Variables* | |
| Size | Natural logarithm of total assets: $\log(\texttt{at})$. |
| Tobin's Q | Book value of equity plus long-term debt over total assets: $(\texttt{ceq} + \texttt{dltt})/\texttt{at}$. |
| Leverage | Ratio of total debt (long-term + current) to total assets: $(\texttt{dltt} + \texttt{dlc})/\texttt{at}$ |
| Sales Growth | Annual growth in sales: $(\texttt{sale} - \texttt{L1.sale})/\texttt{sale}$. |
| Tangibility | Asset tangibility, defined as the ratio of net property, plant, and equipment to total assets: $\texttt{ppent}/\texttt{at}$. |
| Intangibility | Ratio of intangible assets to total assets: $\texttt{intan}/\texttt{at}$. |
| Z-score | Altman Z-score (1968) |
| FD | Financing Deficit (%): Following Frank and Goyal (2003), this variable is defined as the sum of cash dividends (dvc), capital expenditures (capx), acquisitions (aqc), investment in other assets (ivch), and the change in working capital (act−lct), minus operating cash flow (oancf); scaled by lagged total assets (at). All components are set to zero where missing. The variable proxies for a firm's reliance on external financing. |
| Net Debt Issues | The net amount of long-term debt issued by the firm, defined as debt issuance (dltis) minus debt repayments (dltr), scaled by lagged total assets. Missing values are set to zero to retain sample size. This variable captures a firm's reliance on long-term debt financing relative to its size. |
| *Investment variables* | |
| CAPX + AQC | Capital investment (%): 100 × [capx + aqc] / lagged total assets. Missing values in capx and aqc are imputed with zeros. |
| Δ AT | Change in total assets (%): 100 × (at - L1.at) / lagged total assets. |
| R&D | R&D intensity (%): 100 × xrd / lagged total assets. Missing values in xrd are imputed with zeros. |
| Total | Total investment (%): 100 × [capx + aqc + xrd + Δintan] / lagged total assets. Δintan is the annual change in intangible assets. Missing values are imputed with zeros for all components. |

**Panel B: Descriptive Statistics**

| Variable | N | Mean | SD | Min | P25 | P50 | P75 | Max |
|---|---|---|---|---|---|---|---|---|
| LRISK | 50,612 | 0.00 | 1.00 | -0.59 | -0.46 | -0.26 | 0.05 | 30.28 |
| SIZE | 60,149 | 6.80 | 2.21 | 1.05 | 5.24 | 6.77 | 8.27 | 14.34 |
| Tobin's Q | 59,896 | 0.62 | 0.25 | -1.89 | 0.53 | 0.69 | 0.79 | 0.98 |
| Leverage | 59,899 | 0.24 | 0.25 | 0.00 | 0.04 | 0.19 | 0.36 | 2.63 |
| Sales Growth | 53,427 | -0.05 | 1.70 | -42.76 | -0.03 | 0.06 | 0.16 | 1.00 |
| Tangibility | 59,728 | 0.22 | 0.23 | 0.00 | 0.04 | 0.13 | 0.31 | 0.95 |
| Intangibility | 59,163 | 0.18 | 0.21 | 0.00 | 0.01 | 0.10 | 0.30 | 0.90 |
| Z-score | 52,710 | 0.94 | 6.28 | -81.73 | 0.73 | 2.02 | 3.23 | 12.43 |
| FD | 60,149 | 0.15 | 0.51 | -0.78 | -0.03 | 0.02 | 0.14 | 7.45 |
| Net Debt Issues | 60,149 | 0.03 | 0.19 | -6.74 | -0.01 | 0.00 | 0.01 | 11.40 |
| CAPX + AQC | 60,149 | 7.24 | 14.48 | -14.11 | 0.88 | 3.22 | 7.84 | 204.84 |
| Δ AT | 57,324 | 11.93 | 49.31 | -82.90 | -3.89 | 4.55 | 15.42 | 750.22 |
| R&D | 60,149 | 6.25 | 15.26 | 0.00 | 0.00 | 0.00 | 5.89 | 194.45 |
| Total | 60,149 | 16.57 | 36.44 | -44.36 | 1.32 | 7.19 | 18.43 | 523.37 |

Table 7: Variable Definitions and Descriptive Statistics

**Note:** Panel A describes the variables used in this paper. Panel B provides summary statistics. LRISK is standardized across all firm-year observations. All other variables are winsorized at the 0.1% and 99.9% levels.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAPX + AQC | CAPX + AQC | CAPX + AQC | Δ AT | Δ AT | Δ AT | R&D | R&D | R&D | Total | Total | Total |
| **LRISK** | **-0.223**** | **-0.267**** | **-0.330***** | **-1.086***** | **-1.022***** | **-1.467***** | **-0.387***** | **-0.463***** | **-0.489***** | **-0.867***** | **-1.233***** | **-1.478***** |
| | **(-2.569)** | **(-2.389)** | **(-2.910)** | **(-3.470)** | **(-3.055)** | **(-4.092)** | **(-3.998)** | **(-3.374)** | **(-3.659)** | **(-3.270)** | **(-4.284)** | **(-5.164)** |
| Size | -3.632*** | -3.374*** | -2.330*** | -24.254*** | -23.291*** | -16.693*** | -3.304*** | -2.255*** | -1.768*** | -13.687*** | -10.501*** | -6.792*** |
| | (-9.890) | (-9.763) | (-6.716) | (-14.236) | (-13.368) | (-12.172) | (-12.659) | (-8.262) | (-7.020) | (-13.911) | (-10.842) | (-7.460) |
| Tobin's Q | 3.302*** | 2.524** | 2.202** | -6.727** | -10.014** | -11.015** | -8.865*** | -5.507*** | -5.776*** | -4.536 | -1.049 | -2.429 |
| | (5.319) | (2.596) | (2.228) | (-2.113) | (-2.569) | (-2.718) | (-5.826) | (-3.652) | (-3.883) | (-1.423) | (-0.277) | (-0.640) |
| Leverage | -9.714*** | -8.160*** | -7.369*** | -7.537* | -7.392 | -0.109 | -0.360 | -3.090*** | -2.730*** | -14.728*** | -13.266*** | -10.048*** |
| | (-8.026) | (-5.926) | (-5.554) | (-1.826) | (-1.417) | (-0.019) | (-0.541) | (-3.417) | (-2.994) | (-6.231) | (-4.748) | (-3.594) |
| Sales Growth | | 0.124*** | 0.107** | | 0.458 | 0.301 | | 0.060 | 0.053 | | 0.320** | 0.255* |
| | | (2.946) | (2.309) | | (1.329) | (0.891) | | (0.907) | (0.800) | | (2.537) | (2.064) |
| Tangibility | | -9.961*** | -10.623*** | | -8.575 | -2.618 | | 3.478** | 3.353** | | -19.370*** | -19.925*** |
| | | (-4.699) | (-5.021) | | (-1.583) | (-0.425) | | (2.304) | (2.299) | | (-5.299) | (-5.591) |
| Intangibility | | -16.011*** | -16.358*** | | -10.981*** | -14.270*** | | -0.417 | -0.455 | | -60.601*** | -61.851*** |
| | | (-8.233) | (-8.405) | | (-3.284) | (-3.936) | | (-0.427) | (-0.465) | | (-12.362) | (-12.276) |
| Z-score | | 0.311*** | 0.278*** | | 0.094 | -0.220 | | -0.623*** | -0.645*** | | -0.100 | -0.252 |
| | | (4.460) | (4.201) | | (0.245) | (-0.590) | | (-5.398) | (-5.719) | | (-0.427) | (-1.155) |
| Constant | 33.882*** | 37.603*** | 30.650*** | 190.269*** | 185.018*** | 137.771*** | 35.050*** | 26.311*** | 23.087*** | 120.797*** | 112.670*** | 87.651*** |
| | (12.614) | (14.302) | (11.319) | (15.263) | (14.577) | (14.083) | (15.230) | (14.410) | (13.033) | (16.101) | (15.152) | (11.790) |
| Firm Fixed Effects? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year Fixed Effects? | Yes | Yes | No | Yes | Yes | No | Yes | Yes | No | Yes | Yes | No |
| Industry Fixed Effects? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 46,357 | 36,546 | 36,546 | 46,343 | 36,531 | 36,531 | 46,357 | 36,546 | 36,546 | 46,357 | 36,546 | 36,546 |
| $R^2$ | 0.263 | 0.254 | 0.246 | 0.229 | 0.239 | 0.215 | 0.799 | 0.814 | 0.812 | 0.265 | 0.261 | 0.250 |

Table 8: Legal Risk and Firm Investment

**Note:** This table reports panel regressions of alternative investment measures on lagged firm-level legal risk exposure (LRISK). The data spans 2002 - 2024. The dependent variables include capital expenditures and acquisitions (denoted as CAPX), changes in total assets (ΔAT), R&D expenditures (R&D), and a comprehensive investment measure combining capital expenditures, acquisitions, R&D, and changes in intangible assets (denoted as Total). All investment measures are scaled by beginning-of-year total assets. LRISK is a firm-level measure of legal risk constructed from textual analysis of corporate disclosures. Control variables include firm size, Tobin's Q, leverage, sales growth, asset tangibility, intangible intensity, and Altman's Z-score. Standard errors are two-way clustered at the firm and year levels. Coefficient estimates are reported with *t*-statistics in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

| **Dependent variable: Net Debt Issues** | | | | |
|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** |
| FD | 0.152*** | 0.156*** | 0.154*** | 0.175*** |
| | (15.90) | (15.51) | (15.37) | (15.17) |
| LRISK | 0.001 | 0.002 | 0.002 | 0.002 |
| | (0.96) | (1.42) | (1.60) | (1.36) |
| **LRISK × FD** | **-0.016***** | **-0.017***** | **-0.016***** | **-0.019***** |
| | **(-3.48)** | **(-3.88)** | **(-3.62)** | **(-4.07)** |
| SIZE | | | 0.028*** | 0.027*** |
| | | | (12.68) | (10.70) |
| Tobin's Q | | | 0.027*** | 0.034*** |
| | | | (2.67) | (2.95) |
| Leverage | | | 0.227*** | 0.223*** |
| | | | (22.29) | (19.26) |
| Sales Growth | | | | 0.001 |
| | | | | (0.79) |
| Tangibility | | | | -0.022 |
| | | | | (-1.22) |
| Intangibility | | | | 0.089*** |
| | | | | (6.84) |
| Z-score | | | | -0.001*** |
| | | | | (-3.48) |
| Firm Fixed Effects? | Yes | Yes | Yes | Yes |
| Year Fixed Effects? | No | Yes | Yes | Yes |
| Industry Fixed Effects? | No | Yes | Yes | Yes |
| Observations | 50,406 | 47,750 | 47,530 | 40,804 |
| $R^2$ | 0.280 | 0.294 | 0.341 | 0.361 |

Table 9: Legal Risk and Debt Financing

**Note:** This table reports the relationship between firm-level legal risk and debt financing. The dependent variable is net debt issuance scaled by lagged assets. FD denotes the financing deficit, following Frank and Goyal (2003). LRISK is a standardized measure of firm-level legal risk, and LRISK × FD is their interaction. All regressions include firm fixed effects. Columns (2)–(4) additionally include year and industry (2-digit SIC) fixed effects. T-statistics are reported in parentheses and are clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

# Legal Risk

## Online Appendix

- **Section A**: Market Responses to Legal Risk: Case Evidence
- **Section B**: Earnings Call Signals of Legal Exposure
- **Section C**: Law-CAPM
- **Section D**: Additional Analysis and Data Mining Concerns
- **Section E**: LRISK and Equity Financing
- **Section F**: Aggregate LRISK vs. Uncertainty Measures
- **Section G**: Firm-level Evidence: Case studies using SolarWinds
- **Section H**: Legal Shifts: Implications for Firms and Markets

# A Market Responses to Legal Risk: Case Evidence

Legal risk is not merely an abstract concern for firms—it has tangible financial consequences that investors and corporate decision-makers systematically monitor. High-profile lawsuits, regulatory actions, and emerging legal challenges frequently trigger significant market reactions, demonstrating that legal uncertainty is a key determinant of firm value. Boards of directors are also highly responsive to heightened litigation risk, adjusting their oversight and decision-making accordingly (Laux 2010).[1] The following cases illustrate how legal risk translates into substantial stock price movements and strategic corporate responses.

Investors systematically care about legal risk as they actively monitor and react to such risks. For instance, shares of GSK dropped over 9% after a Delaware judge allowed 70,000 lawsuits alleging that its discontinued heartburn drug, Zantac, caused cancer to proceed, wiping out nearly $8.9 billion in market value. These lawsuits have posed a significant concern, erasing approximately $40 billion in combined market value from GSK, Sanofi, Pfizer, and Haleon during a similar legal scare in August 2022.[2]

Recent evidence further highlights the significant financial repercussions of legal risk. Climate change litigation, for example, has emerged as a material financial risk for firms in carbon-intensive industries. A study examining lawsuits against major polluters found that litigation announcements lead to statistically significant declines in share prices, reflecting investor concerns over regulatory penalties, reputational damage, and future compliance costs.[3] As climate-related litigation becomes more prevalent, firms exposed to environmental liabilities face heightened legal uncertainty, reinforcing the notion that legal risk is a systematic force shaping investment decisions.

# B Earnings Call Signals of Legal Exposure

Extracting keywords from earnings call transcripts is essential for identifying underlying signals of litigation risk faced by firms. This section of the online appendix provides ad-

[1] See also https://fticommunications.com/the-decade-of-disputes-litigation-is-on-the-boardroom-agenda-for-the-year-ahead/

[2] https://www.reuters.com/business/healthcare-pharmaceuticals/gsk-shares-tumble-9-after-70000-zantac-lawsuits-allowed-move-forward-2024-06-03/

[3] https://www.theguardian.com/environment/2023/may/22/big-polluters-share-prices-fall-climate-lawsuits-fossil-fuels-study

ditional details to clarify the robustness of my analysis and ensure its accuracy.

To begin, I adopt a conservative approach and deliberately exclude the keyword "litigation" and closely related terms. This decision is guided by two key considerations. First, most firms are required to include disclaimers at the start of their earnings calls, such as:

*"Before we begin, may I draw your attention to the disclaimer on our presentation and company announcement regarding forward-looking statements as defined in the U.S. Private Securities Litigation Reform Act of 1995."*

This standardized disclaimer, ubiquitous across firms, could inadvertently introduce noise into the analysis by classifying firms with no genuine litigation exposure into portfolios of firms with such risks. Including the term "litigation" could therefore compromise the integrity of the portfolio sorting process. Second, the terms "litigation" and "legal" are often used interchangeably in earnings calls. Since "legal" is already incorporated into my analysis, excluding "litigation" does not result in any substantive loss of information or analytical rigor.

Another important aspect of keyword extraction is dealing with terms that have multiple meanings, which can vary significantly based on context. Take, for example, the term "judge." As a verb, it could simply mean making a decision or forming an opinion, which may have no legal relevance. However, the term "Judge" (i.e., used with a capital letter) specifically refers to a legal authority figure. To maintain the precision of the dataset, I include "Judge" but exclude the lowercase "judge" to ensure that I capture relevant legal contexts. While a similar approach could be applied to the term "court" (which could imply an attempt to entice someone), I include both "court" and "Court" because it is unlikely that "court" would refer to social enticement given the corporate context of earnings calls.

Litigations related to patents are quite common, making patent-related terms an important consideration in this analysis. However, to maintain precision, I include only terms with clear legal implications, such as "patent infringement," while excluding broader terms like "patent." The rationale for this distinction is that technology firms often reference their patents in contexts unrelated to legal issues, such as discussing innovation or intellectual property strategies. Including the term "patent" indiscriminately could introduce noise, as it might capture mentions that have no legal significance, thereby diluting the accuracy of the analysis. By focusing on terms with explicit legal linkage, I ensure the analysis remains targeted and relevant. Ambiguity in language poses a significant challenge in

text analysis, particularly when extracting legal nuances from corporate communications. For example, the term "complaint" could refer to a legal filing but may also be used in non-legal contexts, such as describing a customer's dissatisfaction with a product. Such ambiguity can obscure the legal relevance of the term if not carefully managed.

To address this, terms like "complaint" when used in isolation are excluded so that I focus on more legally specific phrases, such as "amended complaint," which refers to a formal revision of a plaintiff's original filing. Similarly, ambiguous terms such as "claim"—which could refer to insurance claims or warranty claims in non-legal contexts—are excluded unless they appear in explicitly legal contexts, such as "legal claim," "counterclaim," or terms associated with clear legal proceedings. Additionally, terms like "settle" are carefully evaluated, as they may relate to financial contexts rather than legal settlements. By excluding these ambiguous or context-dependent terms unless they are part of a legally meaningful phrase, the keyword extraction process is refined to more accurately identify instances of litigation risk while minimizing noise from irrelevant mentions.

As a result, the final set of keywords used to identify firm-level legal risk is listed below. Keywords frequently appearing in corporate earnings calls are highlighted in italics.

- **Judicial Entities and Key Participants (LRISK_COURT)**
  - **Judicial Entities**: Administrative Court, Appeal Court, Apppellate Court, Arbitration Court, Arbitration Tribunal, Bankruptcy Court, ***Commission***, Constitutional Court, ***Court(s)***, ***Department of Justice*** (***DOJ***), District court, Eastern District, European Court, European Court of Justice (ECJ), Federal Court, Fifth Circuit, High Court, Lower Court, Northern District, Oversight Board, Patent Office, Southern District, ***Supreme Court***, Trial Court,
  - **Key Participants**: Administrative Law Judge (ALJ), Arbitrator, Attorney General, Defendants, Federal Judge, ***Judge***, Jury, Plaintiff(s), Prosecutor(s)
- **Legal Processes and Disputes (LRISK_TRIAL)**
  - **Legal Processes**: ***Appeals***, ***Arbitration***, Bankruptcy Process, Binding Arbitration, Class Action, Court Approval, Court Hearing, Court Process, Court Proceedings, Evidentiary Hearings, ***Hearing(s)***, IPR Process, Judicial Process, Judicial Review, Legal Proceeding, Legal Process, Markman, Mediation Process, Next Hearing, Oral Argument, Oral Hearing, Pending Cases, Rebuttal Testimony, Retrial, Trial Date, Full Trial, ***Petition***, Procedural Schedule, ***Settlement***, ***Settlement Agreement***

- **Legal Disputes**: Adverse Ruling, Antitrust Case, Arbitration Case, Class Action Lawsuit, Civil Cases, Civil Litigation, Infringement, ***Injunction***, IP Litigation, ***Lawsuit(s)***, Legal Challenges, Legal Claim, Legal Disputes, Patent Case, Patent Claims, Patent Dispute, Patent Infringement, ***Ruling***, Settlement Agreement, Tentative Settlement

- **Legal Terms and Concepts (LRISK_TERMS)**
  - Amended Complaint, Case Law, Compliance Filing, Constitutionality, Counterclaims, Injunctive Relief, Legal Basis, ***Legal Costs***, ***Legal Fees***, ***Legal Expenses***, Sub Judice, Regulatory Issue

# C Law-CAPM

This section introduces a simple equilibrium model that adjusts for legal risk in the standard capital asset pricing model. The model closely follows Acharya and Pedersen (2005).

In an infinite overlapping generations (OLG) economy, where $n \in N$ agents in generation $t$ maximize a Constant Absolute Risk Aversion (CARA) utility function $-E_t \exp(-\alpha c_{t+1})$ where $\alpha$ is the coefficient of risk aversion and $c_{t+1}$ represents an agent's consumption at time $t+1$. The economy features $I$ securities, indexed by $i = 1, 2, \cdots, I$, each with a total of $S_i$ shares available. At time $t$, security $i$ pays a dividend $D_{i,t}$, has an ex-dividend share price $P_{i,t}$, and incurs a legal cost $L_{i,t}$. This legal cost, modeled as the per-share cost of selling security $i$, implies that while agents can purchase a share at $P_{i,t}$, they can only sell it at $P_{i,t} - L_{i,t}$.[4] Agents can borrow and lend at an exogenous risk-free rate $r_f$. Short-selling is prohibited.

From the standard CAPM framework:

$$E_t(r_{i,t+1}) = r_f + \gamma_t \underbrace{\frac{cov_t(r_{i,t+1}\ ,\ r_{m,t+1})}{var_t(r_{m,t+1})}}_{\beta_t^{capm}}, \tag{A.1}$$

[4]This is a reasonable assumption given that high litigation risk amplifies market frictions through asymmetric information, uncertainty, and lower liquidity, all of which justify higher trading costs for the securities of such firms. Kacperczyk and Pagnotta (2024) argue that legal risk and insider trading both heighten transaction costs by increasing information asymmetry and adverse selection risk, prompting liquidity providers to widen bid-ask spreads and further reducing market liquidity. Eleswarapu and Venkataraman (2006) show that firms in countries with weaker legal institutions or lower enforcement of laws (implying higher legal or litigation risk) experience significantly higher trading costs. Although their focus is on cross-country variation in legal and political institutions, the findings illustrate how weaker institutional environments amplify information risk and deter investor participation, thereby directly impacting trading costs.

where $\gamma_t$ represents the price of risk, and the subscript $t$ for expectation, covariance, and variance indicates that these operators are conditional on the information set available up to time $t$. To account for legal costs, the model is extended as follows:

$$E_t(r_{i,t+1} - l_{i,t+1}) = r_f + \gamma_t^l \underbrace{\frac{cov_t(r_{i,t+1} - l_{i,t+1}\ ,\ r_{m,t+1} - l_{m,t+1})}{var_t(r_{m,t+1} - l_{m,t+1})}}_{\beta_t^l} \tag{A.2}$$

where $r_{i,t+1} = (D_{i,t+1} + P_{i,t+1})/P_{i,t}$ represents the asset's expected gross return, $l_{i,t+1} = L_{i,t+1}/P_{i,t}$ is the relative legal cost of a firm, $r_{m,t+1} = \sum S_i(D_{i,t+1} + P_{i,t+1})/\sum S_i P_{i,t}$ denotes the market return, and $l_{m,t+1} = \sum S_i L_{i,t+1}/\sum S_i P_{i,t}$ is the market-wide legal cost. As demonstrated in Acharya and Pedersen (2005), equilibrium prices in an economy with frictions, such as legal costs, are equivalent to those in a hypothetical frictionless economy where an asset $i$ is assumed to have a dividend of $D_{i,t} - L_{i,t}$.

Using the covariance property, equation A.2 can be rewritten as

$$\begin{aligned} E_t(r_{i,t+1}) = r_f &+ E_t(l_{i,t+1}) \\ &+ \gamma_t^l \underbrace{\frac{cov_t(r_{i,t+1}\ ,\ r_{m,t+1})}{var_t(r_{m,t+1} - l_{m,t+1})}}_{\text{(A) } \beta_{1,t}^l} \\ &- \gamma_t^l \underbrace{\frac{cov_t(r_{i,t+1}\ ,\ l_{m,t+1})}{var_t(r_{m,t+1} - l_{m,t+1})}}_{\text{(B) } \beta_{2,t}^l} \\ &- \gamma_t^l \underbrace{\frac{cov_t(l_{i,t+1}\ ,\ r_{m,t+1})}{var_t(r_{m,t+1} - l_{m,t+1})}}_{\text{(C) } \beta_{3,t}^l} \\ &+ \gamma_t^l \underbrace{\frac{cov_t(l_{i,t+1}\ ,\ l_{m,t+1})}{var_t(r_{m,t+1} - l_{m,t+1})}}_{\text{(D) } \beta_{4,t}^l} \end{aligned} \tag{A.3}$$

Equation A.3 states that the required return for security $i$ comprises the following components: the expected relative legal cost, $E_t(l_{i,t+1})$; exposure to the market beta-equivalent component (adjusted for trading costs in the denominator, referred to as term (A)); and exposures to three additional factors.

The first part, (B), captures the sensitivity of expected returns to the covariance between the individual security's returns and aggregate market legal risk. It enters the equation negatively because investors are willing to accept lower returns on stocks that perform better (or at least do not perform poorly) during periods of heightened market-wide legal risk. The second component, (C), reflects investors' willingness to accept a lower expected return on securities with lower levels of legal risk during economic downturns, as these periods coincide with times when investors are financially constrained, and such securities provide a hedge against worsening economic conditions. Lastly, the third part, (D), represents the legal risk arising from the comovement of an individual security's legal risk with broader market legal risk (i.e., commonality in legality). Investors demand additional compensation for holding securities whose legal risk is highly correlated with market-wide legal risks.

# D Additional Analysis and Data Mining Concerns

This section provides a series of additional analyses to assess the robustness and distinctiveness of the LAW factor. I first conduct alternative calendar-time portfolio analyses using different portfolio formation periods and a zero–nonzero legal risk sorting approach. I then examine whether the LAW factor is subsumed by broader behavioral explanations such as market sentiment, mispricing-based factors, and belief disagreement. Further, I explore whether short-term mood fluctuations, reflected in day-of-the-week return patterns, can explain the LAW premium. Finally, I assess the relationship between the LAW factor and ESG-based risk factors and address concerns about potential data mining. Collectively, these exercises reinforce the robustness and unique economic interpretation of the LAW factor, enabling me to rule out potential data mining concerns.

## D.1 Robustness Checks on the Calendar-time Portfolio Analysis

This section expands the empirical analysis by introducing additional portfolio strategies to test the robustness of the main findings. The primary result employs a (12-12) portfolio strategy, where portfolios are formed at the end of June each year using the past 12 months (i.e., 4 quarters) of earnings calls transcripts information, and stocks are weighted by their market capitalization as of that date. The formed portfolio lasts for the next 12 months,

ending in June of the following year. This approach aligns with the standard methodology for constructing risk factor anomalies.

To leverage the higher frequency of quarterly earnings conference calls, Table B.1 reports three additional portfolio strategies: (12-3), (12-6), and (6-6). Moreover, I present an alternative "zero-nonzero" approach under the (12-12) strategy, where portfolios are sorted by stocks with zero versus positive exposure to legal risk. To ensure that any performance differences arise solely from the portfolio formation periods, I preserve the original setting by using market capitalization weights as of the end of June each year.

The results from all four strategies, summarized in Table B.1, demonstrate strong statistical significance. These findings affirm that variations in portfolio formation periods do not affect the core conclusion. In additional unreported analyses, I confirm that including both utility and financial firms (which were previously excluded in the construction of the LAW factor in the main text) and capping the market capitalization of my earnings call firm sample at the 95th percentile (which approximately corresponds to the 80th percentile NYSE breakpoint[5] as used in Jensen et al. (2023) yields qualitatively similar results.

[5]This discrepancy appears to stem from the inclusion of NASDAQ and NYSE American (formerly known as AMEX) firms in my sample, in addition to NYSE firms.

**Panel A: (12-3) strategy (%)**

| | P1 | P2 | P3 | P3 - P1 |
|---|---|---|---|---|
| | No legal risk | Middle legal risk | High legal risk | long - short |
| Excess return | 0.626 | 0.950 | 0.970 | **0.347*** ** |
| | (2.02) | (3.26) | (3.29) | **(3.34)** |
| FF3 alpha | -0.185 | 0.107 | 0.154 | **0.339*** ** |
| | (-2.26) | (2.03) | (2.81) | **(3.32)** |
| FF5 alpha | -0.156 | 0.062 | 0.133 | **0.289*** ** |
| | (-2.13) | (1.25) | (2.97) | **(3.09)** |

**Panel B: (12-6) strategy (%)**

| | P1 | P2 | P3 | P3 - P1 |
|---|---|---|---|---|
| | No legal risk | Middle legal risk | High legal risk | Long - Short |
| Excess return | 0.693 | 0.946 | 0.979 | **0.286*** ** |
| | (2.21) | (3.29) | (3.29) | **(3.03)** |
| FF3 alpha | -0.163 | 0.109 | 0.153 | **0.316*** ** |
| | (-2.07) | (2.04) | (2.87) | **(3.33)** |
| FF5 alpha | -0.163 | 0.042 | 0.120 | **0.283*** ** |
| | (-2.24) | (0.87) | (2.32) | **(3.08)** |

**Panel C: (6-6) strategy (%)**

| | P1 | P2 | P3 | P3 - P1 |
|---|---|---|---|---|
| | No legal risk | Middle legal risk | High legal risk | Long - Short |
| Excess return | 0.746 | 1.003 | 0.953 | **0.207** ** |
| | (2.54) | (3.41) | (3.22) | **(2.40)** |
| FF3 alpha | -0.085 | 0.171 | 0.112 | **0.198** ** |
| | (-1.32) | (3.28) | (1.94) | **(2.31)** |
| FF5 alpha | -0.117 | 0.122 | 0.063 | **0.180*** ** |
| | (-1.88) | (2.45) | (1.22) | **(2.27)** |

**Panel D: (12-12) strategy using Zero-Nonzero legal risk approach (%)**

| | P1 | P2 | P2 - P1 |
|---|---|---|---|
| | No legal risk | Any legal risk | Long - Short |
| Excess return | 0.645 | 0.969 | **0.324*** ** |
| | (2.03) | (3.37) | **(3.44)** |
| FF3 alpha | -0.209 | 0.139 | **0.348*** ** |
| | (-2.17) | (3.66) | **(3.64)** |
| FF5 alpha | -0.205 | 0.089 | **0.294*** ** |
| | (-2.10) | (2.88) | **(3.05)** |

Table B.1: Long-Short Strategy Results using Different Formation Period

**Note:** In both panels, the average future excess returns (2004:07 - 2024:06) alongside the alpha results derived from portfolios constructed based on ex-ante legal risk measures are presented. Panel A presents a portfolio strategy that uses (12-3) strategy, and Panel B presents (3-3) strategy. Firms in P1 (Low litigation risk) are those with no exposure to litigation risk. Firms with litigation risk are split into two groups, placed in P2 or P3 according to their level of exposure. The portfolio return data spans from July 2003 to December 2023. Utility firms (SIC codes 4900–4999) and financial firms (SIC codes 6000 - 6411, 6500 - 6553, and 6700 - 6799) are excluded due to the highly restrictive nature of government regulation. The numbers in parenthesis are Newey-West t-statistics with 6 lags. ***/**/* denote the statistical significance at 1%/5%/10% level.

## D.2 Market Sentiment and Mispricing explanations

In the behavioral finance literature, there has been a sustained effort to explain return predictability and risk premia through the lens of mispricing and investor biases. Prominent examples include models that attribute anomalies to underreaction, overreaction, or limits to arbitrage, such as the PEAD and FIN factors proposed by Daniel et al. (2020), and the MGMT and PERF factors developed by Stambaugh (2017), which aggregate information across known anomalies related to managerial behavior and firm performance, respectively. A related strand of research emphasizes investor belief dispersion as a source of pricing distortions, culminating in the construction of a disagreement index by Huang et al. (2021), which combines 24 individual disagreement measures using a partial least squares (PLS) approach.

Against this backdrop, I examine the LAW factor and find that it is not subsumed by these existing behavioral constructs. First, the returns to the LAW factor—whether measured on the long leg, short leg, or as a long-short portfolio—do not exhibit sensitivity to market-wide sentiment, as proxied by the index of Huang et al. (2015), in contrast to the pattern observed for traditional anomalies (Stambaugh et al. 2012). Second, regressions controlling for PEAD, FIN, MGMT, PERF, and the aggregate disagreement index of Huang et al. (2021) all leave the alpha on LAW economically meaningful and statistically significant. These findings suggest that the premium associated with legal risk reflects a distinct pricing channel—one that is not captured by current models of mispricing, sentiment, or disagreement.

**Panel A: Predictive regression results**

Regression is of the form $LAW_{t+1}^{tercile} = \alpha + \beta s_t + \varepsilon_{t+1}$, where $s_t$ is the Huang et al. (2015) market sentiment

| Dep. Variable | $\beta$ | $t(\beta)$ | R-squared (%) | Constant? |
|---|---|---|---|---|
| $\mathbf{LAW^{Long-Short}}$ | 0.205 | (1.22) | 0.3 | Yes |
| $\mathbf{LAW^{L1}}$ | -0.537 | (-0.91) | 0.3 | Yes |
| $\mathbf{LAW^{L3}}$ | -0.331 | (-0.58) | 0.1 | Yes |

**Panel B: Mispricing Factors and Disagreement**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable: | LAW | LAW | LAW | LAW |
| ↓ Independent variable: | | | | |
| Intercept | **0.377*** (3.59)** | **0.358** (2.48)** | **0.312*** (3.01)** | **0.396*** (2.65)** |
| PEAD | -0.077 (-1.03) | | | -0.067 (-0.75) |
| FIN | 0.019 (0.34) | | | -0.177** (-2.44) |
| MGMT | | 0.175** (2.09) | | 0.308*** (3.49) |
| PERF | | -0.212*** (-3.91) | | -0.139** (-2.27) |
| Disagreement | | | -0.286* (-1.83) | -0.087 (-0.44) |
| FF3 + mom controlled? | Yes | Yes | Yes | Yes |
| Sample | 2004:07 - 2023:12 | 2004:07 - 2016:12 | 2004:07 - 2020:12 | 2004:07 - 2016:12 |
| Adj. R-squared | 0.090 | 0.172 | 0.111 | 0.177 |

## Table B.2: Sensitivity of the LAW Factor to Market-Wide Sentiment and Mispricing-Based Risk Factors

**Note:** This table examines whether the LAW factor is subsumed by market-wide investor sentiment and mispricing-based risk factors. Panel A presents predictive regressions of LAW factor returns across tercile-sorted portfolios (low, high, long-short) on lagged monthly sentiment from Huang et al. (2015). Panel B reports time-series regressions of the LAW factor on combinations of mispricing-based factors: PEAD and FIN from Daniel et al. (2020), and MGMT and PERF from Stambaugh (2017), along with a proxy for belief disagreement (Huang et al. 2021). All regressions include controls for the Fama-French three factors and the momentum factor (FF3 + MOM), but their coefficients are omitted for brevity. The sample periods vary by factor availability and are indicated in each column. T-statistics are Newey-West adjusted with 6 lags, in parentheses. ***/**/* denote the statistical significance at 1%/5%/10% level.

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| **Estimate** | **0.027**** | 0.016 | 0.017 | 0.017 | 0.009 |
| *t-stat* | **(2.40)** | (−0.77) | (−0.65) | (−0.62) | (−1.06) |
| $N$ | 939 | 1,032 | 1,034 | 1,018 | 1,010 |

Table B.3: Day-of-the-Week Effects on LAW Returns

Notes: This table reports the estimates and Newey-West $t$-statistics (lag = 6) for the regression of daily LAW returns on day-of-the-week dummies. ***/**/* denote the statistical significance at 1%/5%/10% level.

Finally, to examine the role of mood in explaining the legal risk result, following the approach of Birru (2018), I estimate the following day-of-the-week regression:

$$\text{LAW}_t = \alpha + \sum_{d=2}^{5} \beta_d \cdot \mathbf{1}_{\text{Day}_t=d} + \varepsilon_t \tag{A.4}$$

where LAW denotes the daily return on the legal risk factor, and $\mathbf{1}_{\text{Day}_t=d}$ is an indicator variable for each weekday, with Monday serving as the omitted benchmark. The results, reported in Table B.3, show that the LAW factor exhibits its highest returns on Mondays, with no statistically significant improvement on Fridays. This pattern is inconsistent with a mood-based mispricing explanation, which predicts stronger returns for speculative assets at the end of the week as investor sentiment improves. Moreover, whereas Birru (2018) finds that the entirety of long-short anomaly returns are earned almost exclusively on Mondays or Fridays, I find that the LAW factor earns considerable returns throughout the week. This evidence further suggests that legal risk is unlikely to be priced through short-term sentiment fluctuations, but instead reflects exposure to a systematic risk component.

## D.3 LAW Factor vs. ESG Factors

In Table B.4, I conduct spanning regression tests using ESG factors from Pedersen et al. (2021) and Pastor et al. (2022). The results in Panel B indicate that the LAW factor is not subsumed by any of the ESG-related factors, underscoring its distinct role in capturing priced risk. Conversely, some ESG factors—such as GMB in column (5) of Panel A—retain significance when used as dependent variables, suggesting partial overlap between ESG and legal risk. Overall, these results imply that while ESG and legal risk factors may share

some common ground, the LAW factor captures a unique dimension of financial market risk premia.

### D.4 Data Mining Concerns

A recent number of articles address the potential data mining concerns. This section briefly details two broad reasons why I believe my LAW factor result is not data-mined.

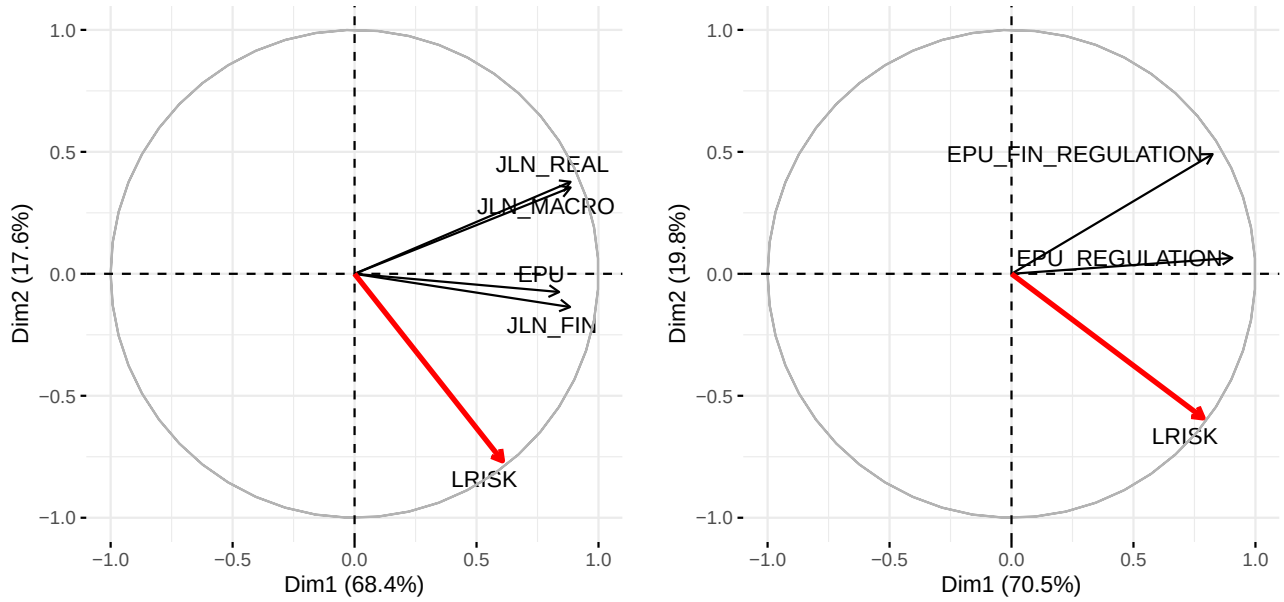
First, my t-statistic result substantially exceeds the new threshold of 3.0 proposed by Harvey et al. (2016), providing strong evidence against data-mining concerns (3.66 for the full 20-year sample spanning 2004–2024, and 4.91 for the post-2010 sample). Second, unlike many anomalies that emerge from mechanical combinations of accounting variables (such as those simulated in Chen and Dim (2024)), my LAW factor is constructed from novel, forward-looking text-based information extracted from earnings call transcripts. Moreover, while many traditional anomalies show sharp decay in predictability after the early 2000s (as highlighted by Chen and Dim (2024) and Ivkovic et al. (2024)), the predictive power of the LAW factor remains strong and stable throughout the post-2004 period (in fact, my sample begins in 2004). This persistent performance further suggests that the LAW factor captures a distinct and economically meaningful source of priced risk, rather than exploiting historical quirks or artifacts of earlier sample periods. Notably, the diminished performance of many traditional accounting-based anomalies after the early 2000s is largely attributed to the reduction in information acquisition costs following the SEC's EDGAR rollout, as shown by Ivkovic et al. (2024), consistent with limited attention theories that predict faster incorporation of information into stock prices over time. Figure 8 in the main text shows that the cumulative performance of the LAW factor has steadily increased over time, indicating that LAW factor performance is not swayed by the investor attention.

## E LRISK and Equity Financing

Table B.5 cross-checks the findings in Table 9 by using net equity issuance (defined as sales of common stock (`sstk`) minus stock repurchases (`prstkc`), scaled by lagged total assets) as the dependent variable. The aim is to test whether firms with high legal risk, when facing external financing needs, substitute away from debt and instead rely more on equity

financing. Across all specifications, the coefficient on the interaction term, LRISK × FD, is statistically insignificant. This suggests that firms exposed to higher legal risk do not offset their reduced debt issuance by increasing equity financing, reinforcing the interpretation that legal risk leads to a broad pullback from external financing rather than a shift in capital structure.

# F Aggregate LRISK vs. Uncertainty Measures




(a) LRISK and JLN & EPU Index

(b) LRISK and EPU Subcategories

Figure A.1: Principal Component Loadings of Legal Risk and Other Uncertainty Measures

**Note:** This figure presents PCA loadings for the aggregate legal risk measure (LRISK) alongside other widely used measures of uncertainty. Panel (a) compares LRISK with broad indices, including the Economic Policy Uncertainty (EPU) index and three components of the Jurado-Ludvigson-Ng (JLN) framework: Macroeconomic, Financial, and Real Uncertainty. Panel (b) focuses on a narrower comparison, displaying PCA loadings for LRISK alongside two subcomponents of the EPU index—EPU Regulation and EPU Financial Regulation. In both panels, PCA is conducted using standardized variables, and the loadings are derived from the correlation matrix. The direction and length of each arrow represent the variable's contribution and alignment with the principal components. The distinct orientation of LRISK relative to the other measures indicates that it captures a unique and orthogonal dimension of uncertainty not accounted for by macroeconomic or policy-based indices.

This section examines how my measure of aggregate legal risk—constructed as a coverage ratio, as described in Section 4.2—compares to established measures of economic uncertainty, including the Economic Policy Uncertainty (EPU) index of Baker et al. (2016) and the Macro Uncertainty index of Jurado et al. (2015) (JLN). To analyze the relationships among these variables, I conduct a principal component analysis (PCA) using quarterly data spanning 2004 to 2024. Since the EPU and JLN indexes are originally available at a monthly frequency, I convert them to quarterly by selecting the end-of-quarter observation. For the JLN measure, I use the $h = 3$ horizon to align with the quarterly frequency. All variables are standardized to have zero mean and unit variance prior to estimation. PCA is then applied to the correlation matrix to extract the primary dimensions of variation across the uncertainty measures.

Figure A.1 displays the resulting factor loadings for LRISK and the alternative indices. In both panels, the direction and length of each arrow represent the contribution and alignment of each variable with the principal components. Variables that point in similar directions are highly correlated, while those that are orthogonal reflect distinct sources of variation. The noticeably different orientation of LRISK relative to EPU and JLN measures suggests that it loads onto a separate dimension. This visual evidence supports the interpretation that legal risk captures an independent and previously unaccounted for component of uncertainty in the cross-section of firms and over time.

**Panel A: ESG factors are dependent variables**

| | PFP factors (1 through 4) | | | | PST factors (5 through 7) | | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| → Dependent variable: | **ESG** | **E** | **S** | **G** | **GMB** | **G** | **B** |
| ↓ Independent variable: | | | | | | | |
| Intercept | -0.087<br>(-0.51) | 0.333<br>(1.61) | -0.163<br>(-1.09) | -0.119<br>(-0.67) | **0.289***<br>**(1.69)** | **0.124***<br>**(1.74)** | -0.165<br>(-1.34) |
| LAW | **0.211****<br>**(2.10)** | 0.082<br>(0.86) | -0.050<br>(-0.56) | -0.028<br>(-0.32) | **0.134***<br>**(1.86)** | **0.115*****<br>**(2.59)** | -0.019<br>(-0.39) |
| Sample | 2007:02 - 2019:03 | 2009:06 - 2019:03 | 2004:07 - 2019:03 | 2004:07 - 2019:03 | 2009:01 - 2023:12 | 2009:01 - 2023:12 | 2009:01 - 2023:12 |
| FF5 + mom controlled? | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

**Panel B: LAW factor is dependent variable**

| | LAW factor | | | | | | |
|---|---|---|---|---|---|---|---|
| ↓ Independent variable: | | | | | | | |
| Intercept | **0.330****<br>**(2.26)** | **0.412****<br>**(2.44)** | **0.328****<br>**(2.32)** | **0.332****<br>**(2.31)** | **0.391*****<br>**(3.40)** | **0.356*****<br>**(3.09)** | **0.431*****<br>**(3.79)** |
| (1) ESG | **0.225****<br>**(2.57)** | | | | | | |
| (2) E | | 0.055<br>(0.95) | | | | | |
| (3) S | | | -0.036<br>(-0.56) | | | | |
| (4) G | | | | -0.022<br>(-0.31) | | | |
| (5) GMB | | | | | **0.131***<br>**(1.77)** | | |
| (6) G | | | | | | **0.465****<br>**(2.34)** | |
| (7) B | | | | | | | -0.035<br>(-0.39) |
| Sample | 2007:02 - 2019:03 | 2009:06 - 2019:03 | 2004:07 - 2019:03 | 2004:07 - 2019:03 | 2009:01 - 2023:12 | 2009:01 - 2023:12 | 2009:01 - 2023:12 |
| FF5 + mom controlled? | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Table B.4: Comparing LAW factor and ESG-relevant factors

**Note:** This table presents spanning tests using Fama-French 5 factors augmented with momentum factors. Panel A uses ESG factors from Pedersen et al. (2021) (PFP factors) and GMB factors from Pastor et al. (2022) (PST factors) as dependent variables. Panel B uses LAW factor as dependent variable. Loadings on FF5 and momentum factors are suppressed. The numbers in parentheses represent Newey-West t-statistics with six lags. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

| **Dependent variable: Net Equity Issues** | | | | |
|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** |
| FD | 0.481*** | 0.474*** | 0.479*** | 0.463*** |
| | (19.97) | (19.30) | (19.11) | (17.91) |
| LRISK | 0.002 | 0.002 | 0.001 | 0.002 |
| | (0.69) | (0.65) | (0.45) | (0.68) |
| **LRISK × FD** | -0.013 | -0.012 | -0.013 | -0.013 |
| | (-0.79) | (-0.74) | (-0.80) | (-0.74) |
| SIZE | | | -0.013*** | -0.023*** |
| | | | (-3.74) | (-5.88) |
| Tobin's Q | | | -0.079*** | -0.120*** |
| | | | (-4.85) | (-7.07) |
| Leverage | | | -0.146*** | -0.150*** |
| | | | (-12.37) | (-11.65) |
| Sales Growth | | | | 0.001 |
| | | | | (0.79) |
| Tangibility | | | | 0.001 |
| | | | | (0.73) |
| Intangibility | | | | 0.051*** |
| | | | | (2.88) |
| Z-score | | | | 0.004*** |
| | | | | (4.53) |
| Firm Fixed Effects? | Yes | Yes | Yes | Yes |
| Year Fixed Effects? | No | Yes | Yes | Yes |
| Industry Fixed Effects? | No | Yes | Yes | Yes |
| Observations | 47,170 | 46,531 | 46,329 | 39,803 |
| $R^2$ | 0.703 | 0.700 | 0.706 | 0.698 |

Table B.5: Legal Risk and Equity Financing

**Note:** This table reports the relationship between firm-level legal risk and equity financing. The dependent variable is net equity issuance scaled by lagged assets. FD denotes the financing deficit, following Frank and Goyal (2003). LRISK is a standardized measure of firm-level legal risk, and LRISK × FD is their interaction. All regressions include firm fixed effects. Columns (2)–(4) additionally include year and industry (2-digit SIC) fixed effects. T-statistics are reported in parentheses and are clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

# G Firm-level Evidence: Case studies using SolarWinds

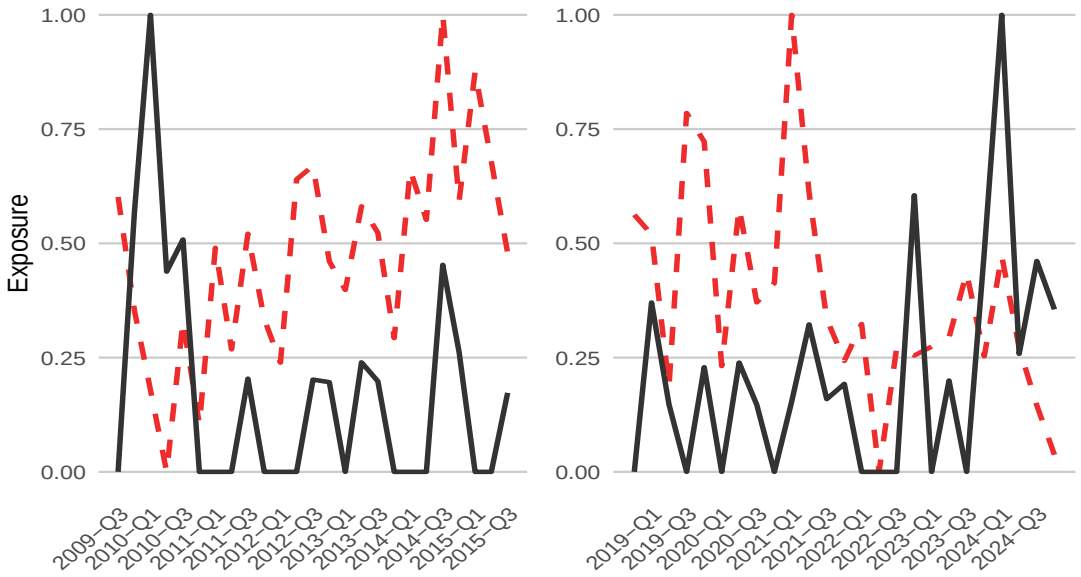



Figure A.2: Case study - SolarWinds

**Note:** This figure presents the legal risk exposure (black solid line) and cyber risk exposure (red dotted line) for SolarWinds Inc. Both text-based exposure measures are normalized to range from 0 to 1 within each subperiod: 2009-Q3 to 2015-Q3 and 2018-Q4 to 2024-Q4. SolarWinds first went public in May 2009, was taken private in October 2015, and subsequently returned to the public market in October 2018.

SolarWinds[6] provides a compelling case study to discuss legal risk exposure of that firm. The study of SolarWinds' cyber risk exposure, pioneered in Florackis et al. (2023) and Jamilov et al. (2025) provide an interesting benchmark to illustrate the legal risk inherent in the cyberrisk-related issues. My analysis builds on these findings by showing that firms responding to cyber risk often face legal risk as a related but distinct mechanism. Notably, SolarWinds first encountered a securities class action lawsuit in 2010, which resulted in a Notice of Voluntary Dismissal. Despite this resolution, the textual analysis of earnings call transcripts during this period shows a noticeable increase in legal risk-related discussions

[6]The company, a provider of IT infrastructure management software, first went public in May 2009. However, in October 2015, it was taken private in a $4.5 billion buyout by private equity firms Silver Lake Partners and Thoma Bravo. In October 2018, SolarWinds re-entered the public markets with its second initial public offering (IPO). More recently, the company announced its intention to delist again in 2025 following an acquisition agreement with Turn/River Capital. Because of this transition between public and private ownership, my analysis presents two separate graphs to illustrate how legal risk exposure and market perception evolved over these distinct periods.

(black solid line in left panel of Figure A.2). This trend reemerged in 2015 when the company was again subject to a class action lawsuit. In this instance, the case concluded with a Court's Order of Dismissal, yet the company's legal risk exposure remained heightened. These early signals suggest that, even when lawsuits do not directly impact financial outcomes, firms anticipate and communicate about potential legal risks in their disclosures, which influences investor perceptions and stock price behavior.

A defining moment for SolarWinds occurred in December 2020 when it became the target of the SolarWinds supply chain attack (SUNBURST attack) that affected thousands of government and private-sector clients. As expected, my analysis shows a sharp spike in the firm's cyber risk measure (denoted by the red dotted line on the right panel) in response to the attack. This event triggered cascading legal consequences, including a class action lawsuit from shareholders and customers who alleged that SolarWinds had failed to implement adequate cybersecurity measures. In addition to these lawsuits, regulatory scrutiny intensified. In October 2023, the U.S. Securities and Exchange Commission (SEC) filed charges against SolarWinds and its Chief Information Security Officer (CISO) for allegedly misleading investors about the company's cybersecurity practices before and during the breach. The SEC's charges significantly increased SolarWinds' legal risk exposure, as reflected in a pronounced uptick in the legal risk measure. This exposure culminated in early 2024, when SolarWinds agreed to a $26 million settlement to resolve investor claims stemming from the 2020 breach.

# H Legal Shifts: Implications for Firms and Markets

This section examines the evolution of the U.S. legal landscape throughout the 21st century and its implications for firms and markets. Specifically, I explore how the early 2000s were characterized by a mix of deregulatory measures and heightened regulatory oversight, while the post-Global Financial Crisis (GFC) era introduced a wave of stringent reforms that reshaped the regulatory framework.

## H.1 The Rise of Aggregate Legal Risk in the Early 2000s

*Background:* The early 2000s were characterized by a series of mixed legal developments that, in aggregate, contributed to an increase in firm-level legal risk and shaped the regulatory climate leading up to the Global Financial Crisis (GFC). On one hand, deregulatory

measures such as the repeal of key provisions of the Glass-Steagall Act via the Gramm-Leach-Bliley Act (GLBA) in November 1999 facilitated financial consolidation. Originally enacted in 1933 to separate commercial and investment banking, the Glass-Steagall Act aimed to limit conflicts of interest and systemic risk. Its repeal under the GLBA allowed financial institutions to operate across banking, securities, and insurance sectors, accelerating the formation of financial conglomerates such as Citigroup. This deregulatory shift expanded the operational scope of financial firms, but also exposed them to more complex and potentially risk-laden legal environments.

Simultaneously, legal reforms at the state level contributed to a more insulated corporate governance regime. In particular, the widespread adoption of Universal Demand (UD) laws during the 1980s and 1990s, and their ongoing effects into the 2000s, substantially weakened shareholder litigation as a mechanism for corporate accountability. These laws required shareholders to make a formal demand to the board before initiating derivative lawsuits, thereby granting directors increased discretion to block litigation. The long-lasting effect of UD laws was a decline in shareholder lawsuits and reduced external monitoring of managerial behavior. Firms incorporated in UD states, as shown by Houston et al. (2018), experienced significantly fewer lawsuits, even in instances of governance failures—effectively lowering litigation risk for managers while raising latent risks for investors and stakeholders.

In contrast to these deregulatory trends, the Sarbanes-Oxley Act (SOX) of 2002 marked a sharp shift toward regulatory tightening in response to high-profile accounting scandals such as Enron and WorldCom. SOX introduced stringent rules on internal controls, mandated executive certification of financial reports, and imposed heavier disclosure burdens on public firms. While SOX sought to restore investor confidence and strengthen oversight, its implementation introduced considerable legal and compliance risk, particularly for firms with opaque reporting practices or weak governance structures.

Taken together, these concurrent shifts created a complex legal landscape. On one side, deregulatory measures such as the GLBA and the enduring impact of UD laws reduced the external constraints on managerial behavior, encouraging risk-taking and innovation. On the other, SOX raised the cost of non-compliance and increased the legal consequences of disclosure failures. The aggregate effect was an elevation in firm-level legal risk, as companies navigated a regulatory environment that was both permissive and punitive. This asymmetry—lax enforcement in some domains and heightened scrutiny in others—contributed to mounting systemic fragilities that were ultimately exposed during the GFC.

## H.2 Stringent Legal Shifts After the Global Financial Crisis

*Background:* The 2008 GFC exposed systemic weaknesses in the U.S. financial system, including excessive risk-taking, regulatory gaps, and corporate misconduct. The resulting economic downturn and public outrage over corporate malfeasance prompted a wave of legislative and regulatory reforms designed to prevent similar crises in the future. The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 was a cornerstone of these reforms, introducing comprehensive measures to enhance market oversight, improve transparency, and promote corporate accountability.

The Securities and Exchange Commission (SEC) played a pivotal role in these reforms by implementing stricter enforcement measures. In 2010, the SEC established specialized units within its Enforcement Division, such as the Market Abuse Unit and the Asset Management Unit, to address complex financial misconduct more effectively. Additionally, the SEC's cooperation program encouraged firms and individuals to assist in investigations through tools like cooperation agreements, deferred prosecution agreements, and non-prosecution agreements. According to Leone et al. (2021), the program's early years were marked by higher enforcement probabilities and increased penalties. However, from 2011 to 2014, enhanced cooperation led to reduced enforcement probabilities and lower penalties, reflecting the program's evolving effectiveness.

A landmark provision in securities law enforcement came with the whistleblower program established under Section 922 of the Dodd-Frank Act. This program offered monetary rewards ranging from 10% to 30% of sanctions collected from SEC enforcement actions exceeding $1 million, alongside robust anti-retaliation protections for whistleblowers. These incentives encouraged individuals to report misconduct early, thereby strengthening the SEC's ability to detect and deter securities violations. Heese and Perez-Vacazos (2021) examine how the costs of retaliation influence employees' decisions to whistleblow, underscoring the program's effectiveness. Beyond the SEC's whistleblower program, the *Cyan, Inc. v. Beaver County Employees Retirement Fund* (*2018*) decision further heightened legal risk in the U.S. by allowing class-action lawsuits under the Securities Act of 1933 to proceed in state courts, increasing the risk of forum shopping. This exposed public companies, particularly those undergoing IPOs or secondary offerings, to costly and unpredictable litigation across multiple venues. Beyond direct legal costs, Cyan raised uncertainty around liability, complicated securities defense strategies, and increased the legal risk premium investors demanded. The prospect of parallel lawsuits in different states strained corporate legal teams, drove up settlement costs, and deterred some firms from

capital-raising activities. The ruling also impacted D&O insurance markets, as insurers adjusted premiums to reflect heightened litigation exposure. Alongside other post-GFC regulatory shifts, Cyan played a key role in shaping the modern U.S. legal risk landscape and its asset pricing implications.

*Impact on Firms Listed on U.S. Public Markets:* The post-GFC reforms significantly elevated the legal risk exposure for publicly listed firms. Companies faced greater regulatory scrutiny and higher compliance costs as they bolstered internal controls and governance frameworks to mitigate legal risks. Financial institutions like JPMorgan Chase and Goldman Sachs incurred substantial penalties for past misconduct and adopted stringent compliance measures in response. The whistleblower provisions of the Dodd-Frank Act further amplified firms' legal risk, evidenced by high-profile cases like the $104 million reward to UBS whistleblower Bradley Birkenfeld, whose disclosures led to significant penalties for the firm. These reforms marked a transformative shift in the U.S. legal landscape, with firms now encountering intensified accountability for both historical and ongoing practices.

In summary, the early 2000s were marked by a blend of deregulatory measures and heightened corporate oversight, fostering both growth and risk. In contrast, the post-GFC era introduced stringent reforms aimed at enhancing market oversight and accountability. The increasing complexity of regulatory requirements and the heightened potential for whistleblower actions have made legal risk a critical consideration in corporate strategy and governance. The findings in this paper, based on post-2010 data, underscore the substantial impact of these legal shifts on U.S. public markets.

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