Biodiversity Risk and Corporate Debt Maturity

Abstract

This paper investigates how biodiversity risks influence corporate debt maturity choices. Utilizing a sample of publicly listed firms in the United States between 2000 and 2023, our findings suggest that exposure to biodiversity risks increases the likelihood that firms will reduce their reliance on short-term borrowing. As firms face significant difficulties in constrained natural resources for their operations under biodiversity risks, they tend to avoid adding inherent risks embedded in short-term debt. However, our paper also finds that larger firm size, diversification across offshoring input countries, and government contracting can help mitigate the adverse impact of biodiversity risks on short-term debt maturities. Our study provides valuable insights for both firms and governments to develop strategies and support mechanisms to address the challenges caused by biodiversity risks.

JEL Codes: G32; G38; Q57; L25

Keywords: biodiversity risk; geographical diversification; government contract; debt maturity; leverage

1 Introduction

Biodiversity, also known as biological diversity, describes the range of living organisms on Earth, encompassing animals, plants, microorganisms, and ecosystems. It plays a crucial role in providing essential resources such as water, food, shelter, and medicine, which are fundamental to human survival. However, human activities and the overuse of natural resources are disrupting natural biodiversity, putting countless species at risk. The World Wide Fund for Nature (WWF)'s 2024 report highlights a 73% decline in wildlife populations over the past fifty years.[1] According to a 2021 World Bank report, the loss of critical ecosystem services (e.g., pollination by wild species, marine fisheries, and timber from natural forests) may cause a $2.7 trillion annual reduction in global GDP by 2030 (Johnson et al., 2021). Similarly, recent degradation of general ecosystem services has been estimated to cost up to $20 trillion per year (Kapnick, 2022), highlighting the critical need to protect biodiversity and ensure the well-being of future generations. Governments and policymakers worldwide have increasingly focused on addressing biodiversity loss. For example, the UN (United Nations) Convention on Biological Diversity (CBD) has been in effect since 1993, with numerous Conferences of the Parties (COPs) having adopted plans to protect biodiversity. Initiatives on an international scale, such as the TNFD (Taskforce on Nature-related Financial Disclosures),[2] the Kunming Declaration, and the Montreal Agreement have also been emphasized in the UN Biodiversity Conference report (COP15) (Wrobel et al., 2023).

The loss of biodiversity can result in serious challenges for businesses, especially those in industries such as forestry, agriculture, fisheries, and pharmaceuticals, which have been heavily dependent on natural resources. A decline in ecosystems can limit the availability of essential raw materials, raise costs, and compromise product quality. Moreover, ecosystem degradation can lead to issues such as water scarcity, soil depletion, and greater vulnerability to natural disasters, creating operational disruptions and increasing overall costs for businesses. However, it is surprising that investors in financial markets have yet to fully account for the risks and

[1] For further details, refer to the report at https://livingplanet.panda.org/en-GB/.
[2] For more details, visit https://tnfd.global/

opportunities linked to biodiversity (Flammer et al., 2025). Only recently, following global agreements such as the Kunming Declaration, have investors begun demanding higher premiums to address biodiversity risks (Garel et al., 2024). There is still limited evidence on how firms are developing strategies to manage biodiversity-related challenges. Karolyi and Tobin-de la Puente (2023) emphasize the need to deepen academic exploration in this field, noting that "there are no studies in the top-tier journals in Finance that have framed the risks related to biodiversity loss." Therefore, we are motivated to address this pressing research need, especially given the current gap in financial literature and the growing recognition among investors of the material risks and opportunities related to biodiversity loss.

This paper is also motivated by the literature on the maturity choice of corporate borrowing (Myers, 1977; Diamond, 1991; Dang and Phan, 2016; González, 2017; Haider et al., 2024) to examine how firms exposed to biodiversity risks make decisions regarding their debt maturity. This is a critical research question, as the debt maturity structure is closely tied to firms' operational strategies and risk management. Biodiversity risks, such as constraints on natural resources, disrupted production processes, and increased material costs, significantly impact firms' operational efficiency (Li et al., 2025; Huang et al., 2024). Along with these issues, firms face increasing regulatory and social scrutiny to uphold environmental standards and protect their reputational status. In light of these challenges, companies must evaluate the relative advantages of short- and long-term borrowing. Raising more short-term debt can mitigate agency problems by encouraging managers to avoid suboptimal investments (Myers, 1977; Stulz, 1990). However, it comes with significant disadvantages, such as refinancing risks, potential denial of future short-term loans, limited rollover periods, and liquidation risks (Froot et al., 1993; Diamond, 1991; Brunnermeier and Yogo, 2009). In contrast, long-term debt offers firms a buffer against biodiversity risks by reducing the frequency of refinancing and providing stability for investment in sustainable resource management practices. By extending debt maturities, firms can alleviate financial pressures during periods of ecological strain, enabling better alignment of their financial strategies with long-term sustainability objectives.

Indeed, a growing body of research emphasizes the significant effects of climate and environmental risks on corporate debt maturity decisions.[3] For instance, Liang et al. (2025) find that firms with stronger climate-related concerns are more likely to issue long-term bonds, reflecting firms' commitment to long-term climate strategies and their greater likelihood of regulatory approval for such instruments. In contrast, Goodell et al. (2025) and Arthur (2025) report that exposure to climate risks reduces firms' reliance on long-term debt, while Choi (2024) similarly shows a shift toward short-term borrowing among climate-exposed firms. In addition, Nguyen and Phan (2020) document that carbon risk results in a reduction in overall leverage, regardless of debt maturity. While these studies offer valuable insights into how climate and carbon risks shape corporate financing, they leave a critical gap unaddressed: the financial implications of biodiversity loss. Our research directly responds to this oversight. We argue that biodiversity risks are fundamentally distinct in nature, as they are tied to the degradation of ecosystem services that businesses rely on for day-to-day operations. Unlike climate risks, which are often systemic and driven by global emissions, biodiversity loss tends to result from localized environmental degradation such as deforestation, land-use change, or resource depletion that can quickly disrupt supply chains, undermine operational stability, and increase firms' exposure to physical and regulatory risks. These ecological failures translate into tangible operational risks, threaten business continuity, and impose significant cost burdens. Given the escalating global biodiversity crisis, understanding how firms adapt their financing strategies in response is not only timely but also essential.

To address our research question, we utilize biodiversity risk data developed by Giglio et al. (2023), which extracts firm-level biodiversity risk exposure from textual disclosures in 10-K reports. This dataset is merged with firm-level financial and accounting data, resulting in a sample of 3,002 unique listed firms in the U.S., comprising 32,814 firm-year observations between 2000 and 2023. Our analysis shows that firms facing biodiversity risks opt to reduce their reliance on short-term debt with maturities of one to three years. Specifically, compared

[3]Other studies, such as Ginglinger and Moreau (2023) and Francis et al. (2025), do not explicitly test the effects of climate risks on debt maturity but find that firms highly exposed to climate change tend to lower overall leverage and increase debt specialization.

to firms without biodiversity risk exposure, these firms reduce their 1-year, 2-year, and 3-year maturity debt by 3.1%, 3.6%, and 2.6%, respectively. These findings remain robust across various robustness checks, including coefficient stability tests following Oster (2019), propensity score matching, and placebo tests.

We identify several mechanisms through which firms mitigate the impact of biodiversity risks, including firm size, geographical offshoring diversification, and government procurement. First, larger firms typically have greater capacity to manage risks due to economies of scale, better access to resources, and more diverse financing options (Barclay and Smith Jr, 1995; Bharath et al., 2011). As a result, the detrimental effect of biodiversity exposure on short-term financing appears to be mitigated in the case of large firms. Second, diversifying input sources internationally benefits firms by enhancing product development, innovation, profitability, and shareholder value while mitigating the unfavorable impact of economic policy uncertainty (Charoenwong et al., 2023; Massini and Miozzo, 2012; Jain and Wu, 2023; Brandon-Jones et al., 2017). In response to resource constraints caused by biodiversity loss in their local areas, firms increasingly engage in offshoring activities—sourcing inputs from multiple countries—which helps to offset the negative impact of biodiversity risks on short-maturity borrowing. Finally, government support plays a critical role in assisting firms facing biodiversity risks (Paglia and Harjoto, 2014; Huang et al., 2016; Dhaliwal et al., 2016). Our findings indicate that firms with government partnerships, such as those holding government contracts, are better able to alleviate the detrimental effects of biodiversity risks on short-term financing.

Our paper makes several significant contributions. We first contribute to the corporate finance literature on the determinants of corporate outcomes. In addition to corporate financial fundamentals, recent studies have documented the effects of climate and environmental risks as emerging factors. For example, climate change exposure induces firms to reduce overall leverage (Ginglinger and Moreau, 2023), bear significant borrowing costs (Ginglinger and Moreau, 2023; Lemma et al., 2021), and lower cash dividends (Chang et al., 2024). Moreover, climate-exposed firms tend to reduce innovation activities (Le et al., 2024; Deng et al., 2024). Javadi et al.

(2023) and Huynh et al. (2020), utilizing country-level climate risk indicators, show that firms in riskier areas hold more cash, utilize long-term debt, and reduce cash payouts. Furthermore, the literature also finds that carbon risks significantly impact firm innovation, payout policy, acquisitions, stock returns, and investment efficiency (Liu et al., 2024; Bolton and Kacperczyk, 2021; Balachandran and Nguyen, 2018; Zhu and Hou, 2022; Li et al., 2024; Bose et al., 2021). In this paper, we highlight the impact of biodiversity risks in corporate finance. Unlike climate risks—which are predominantly driven by atmospheric emissions and manifest through systemic, long-term environmental changes—biodiversity risks stem from the disruption of living natural systems and tend to be more immediate, spatially concentrated, and ecologically complex. Biodiversity risks originate from factors such as deforestation, habitat destruction, overexploitation of species, and land-use conversion. These processes directly impair ecosystem services, including pollination, water regulation, soil stability, and disease control—services that are critical to the operational continuity of many industries, especially agriculture, forestry, fisheries, and pharmaceuticals (Johnson et al., 2021; Kapnick, 2022). The breakdown of these services can cause abrupt and localized shocks that severely disrupt supply chains, reduce the availability and quality of raw materials, and compromise production capacity.

Our second contribution lies in extending the literature on corporate debt maturity, which traditionally examines how internal firm characteristics influence corporate preferences for different debt maturity profiles (Myers, 1977; Diamond, 1991). We broaden this perspective by introducing biodiversity risk as an external, non-financial factor that influences firms' debt maturity decisions. We show that biodiversity risk exposure compels firms to account for the costs, risks, and institutional environments related to biodiversity regulations when selecting debt maturities. Since biodiversity risks affect firm cash flow, production, and operations, the choice of debt maturity influences firms' ability to liquidate assets quickly to repay debt and renegotiate new debt for continued operations.

Third, we add to the growing strand of research on biodiversity within the field of finance, an area that has received limited attention despite calls for further research (Karolyi and Tobin-

de la Puente, 2023). Specifically, our findings add to the literature on biodiversity in corporate finance by highlighting how biodiversity risk shapes firms' financing decisions, particularly with respect to debt maturity. Our findings indicate that firms with biodiversity risks avoid short-term debt to minimize additional risks related to refinancing and liquidation. Lastly, we enrich the literature on geographical offshoring diversification (Massini and Miozzo, 2012; Jain and Wu, 2023; Brandon-Jones et al., 2017; Charoenwong et al., 2023) and government-related contracts (Huang et al., 2016; Paglia and Harjoto, 2014; Dhaliwal et al., 2016) by documenting their roles in mitigating the negative impacts of biodiversity risks. These mechanisms offer important insights into how firms navigate and address the operational and financial difficulties caused by biodiversity loss.

The rest of our paper is organized as follows. Section 2 presents related literature and develops our hypothesis. We explain our data sample, variables, and model specification in Section 3. We report and discuss the empirical results in Section 4. Finally, we conclude in Section 5.

2 Related Literature and Hypothesis Development

The irrelevance theory developed by Modigliani and Miller (1958) suggests that in an ideal market, the way a firm finances itself is irrelevant to its valuation. However, due to market frictions and institutional factors, firms' choices of borrowing and debt maturity structure become crucial. The literature on corporate debt maturity structures comprises of several relevant theories to link the impact of biodiversity risk and short-term debt: cost theory, risk theory, and institutional theory.[4]

From the perspective of cost theory, the literature explains why firms choose short-term debt rather than long-term debt, primarily due to its ability to mitigate agency issues. The pressure of frequent rollovers of short-term debt creates a mechanism that pressures managers to avoid suboptimal investment choices (Myers, 1977; Stulz, 1990) and limits the potential for

[4]Additionally, there is tax-based theory which argues the tax benefits of raising long-term debt over short-term debt (Brick and Ravid, 1985; Leland and Toft, 1996; Kim et al., 1995). However, this theory is not relevant to our paper as tax benefits are not our research questions.

risk shifting (Barnea et al., 1980). Moreover, raising short-term debt helps firms minimize debt overhang problems (Myers, 1977), thereby enabling greater financial flexibility. Therefore, short-term debt acts as a monitoring tool to alleviate agency problems among managers, shareholders, and lenders. However, there are a number of disadvantages associated with short-term debt borrowing. Refinancing costs and the risk of rejection for subsequent short-term debt are critical concerns. Particularly, changes in market conditions and creditors' perspectives on the firm's prospects can induce firms to bear significantly higher interest rates or relevant costs to liquidate assets to repay the short-term debt that would mature shortly (Diamond, 1991; Froot et al., 1993; Brunnermeier and Yogo, 2009). These uncertainties create vulnerabilities for firms relying heavily on short-term debt, especially during periods of market volatility or financial instability.

In contrast, firms often prefer long-term debt for its stability and reduced refinancing risk. By securing long-term debt, firms can lock in borrowing costs and minimize the frequency of engaging with creditors, which lowers transaction costs and provides financial certainty. Long-term debt also enables firms to focus on strategic investments without the constant pressure of maturing obligations. This preference becomes particularly relevant with regard to biodiversity risks. Based on the resource-based theory (Barney, 1991; Hart, 1995), firms operating in resource-dependent sectors face heightened vulnerabilities from biodiversity loss, which can disrupt daily operations and production processes. In such scenarios, inefficient resource management might necessitate the premature liquidation of assets, undermining short-term financial stability. Long-term debt provides a buffer against such risks by reducing the need for frequent refinancing and supporting the firm's ability to invest in sustainable resource management practices. By prioritizing debt maturities that balance the need for monitoring with cost stability, firms can better align their financial strategies with their operational risks, particularly in environmentally sensitive contexts.

Regarding the risk theory, previous studies have documented that corporate debt maturity choices are affected by different types of risks. For example, country-level political risk and

economic policy uncertainties not only affect market conditions but also increase firms' cash flow volatility (Duong et al., 2020; Jens, 2017; Datta et al., 2019), prompting them to opt for shorter debt maturities. Additionally, economic downturns, such as recessions or financial crises, typically restrict credit availability and raise borrowing costs (González, 2015). There is also evidence on the impact of climate change and carbon risks on firms' financing decisions and debt maturities (Ginglinger and Moreau, 2023; Duong and Huynh, 2024). Particularly, Liang et al. (2025) find that climate-concerned firms opt to issue longer-term bonds. Studies by Ginglinger and Moreau (2023) and Lemma et al. (2021) show that lenders demand higher premiums to offset such corporate risks, thereby increasing the barriers for firms seeking bank loans. Drawing on this risk theory, we examine how biodiversity risk influences corporate debt maturity decisions. Biodiversity risks, such as habitat destruction or resource depletion, can destabilize the operational environment of a firm, leading to higher volatility in cash flows and declines in overall performance (Li et al., 2025; Huang et al., 2024). Hence, we propose that firms facing higher biodiversity risks may opt for less short-maturity debt, as the rapid turnover of these obligations can be challenging for firms experiencing reduced efficiency and performance to manage timely repayments. By extending debt maturities, firms can better manage financial pressures during periods of ecological strain, aligning their financial strategies with long-term sustainability goals.

Finally, the institutional theory argues that several country-level institutional forces can influence firms' choices of debt maturity. For example, Hernández-Cánovas and Koëter-Kant (2011) document that in European countries with strong creditor protection and effective laws, small and medium-sized enterprises (SMEs) are more likely to choose long-term loans. Turk Ariss (2016) and Fan et al. (2012) find that firms in countries with more corruption or weaker legal systems often rely on short-maturity debt, while those in places with clear bankruptcy laws prefer long-term debt. A positive association between strong creditor rights and the choice of longer debt maturities is also highlighted by Qian and Strahan (2007). It is evidenced by the study of Sorge et al. (2017) for how legal protections and information asymmetry together in-

fluence firms' choices regarding the maturity of their debts, indicating a trade-off between these factors. In addition, Zheng et al. (2012) find evidence that firms located in countries with high degrees of uncertainty avoidance, power distance, collectivism, and masculinity opt to raise more short-term debt. In the context of biodiversity risk, not only the public but also governments are increasingly focusing on such issues, leading to the creation of more comprehensive action plans, policies, and regulations. For example, global coordination efforts to protect biodiversity, such as the Taskforce on Nature-related Financial Disclosures (TNFD),[5] and the Kunming Declaration and the Montreal Agreement, have been highlighted in the UN Biodiversity Conference report (Conference of the Parties - COP15) (Wrobel et al., 2023). Firms with a higher exposure to biodiversity risks may face significant challenges in meeting these stringent regulations and must also comply to maintain their reputation. These environmental regulations and the associated public and governmental scrutiny directly influence corporate decisions regarding debt maturities, as firms may opt for financial strategies that provide greater flexibility to adapt to regulatory changes. On one hand, biodiversity risks may induce firms to utilize more short-term debt to monitor the efficiency during periods of strict regulations. On the other hand, firms may opt for long-term debt as it can reduce the frequency of refinancing, which is particularly beneficial in volatile regulatory environments where short-term policy shifts could impact the availability or cost of future borrowing.

Collectively, drawing on the frameworks of the cost theory, risk theory, and institutional theory, we argue that firms with a high exposure to biodiversity risk are more likely to minimize their use of short-term debt. Using long-term debt can help firms manage refinancing and liquidation risks linked to short-term obligations, which may be worsened by pressures stemming from biodiversity resource loss. Additionally, these firms often perform worse, making it more challenging to meet short-term financial commitments efficiently. Our hypothesis is written as follows.

H1: Firms exposed to biodiversity risks tend to prefer less short-term debt.

[5]Please see more details at https://tnfd.global/

3 Data Sample and Model Specification

3.1 Data Sample

We start with the Compustat - North America database to obtain financial and accounting data for U.S. firms from 2000 to 2023. We follow previous research to restrict our sample: i) remove financial firms (i.e., the ones with the Standard Industrial Classification (SIC) codes 6000–6999) due to different accounting principles and no debt maturity information for financial firms from Compustat (González, 2015; Duong et al., 2021; Fu et al., 2022; Duong et al., 2024), ii) exclude observations with missing or zero values in total assets, and iii) drop observations with missing data in debt and debt maturity as such information is our research interest. We also use SIC to define Fama-French 48 industry sector. After refining the data from Compustat, we initially obtain 71,341 firm-year observations, in which there are 6,429 unique firms between 2000 and 2023.

Using the firm identifier (CUSIP) and year, we merge the refined Compustat sample with the biodiveristy risk data developed by Giglio et al. (2023).[6] The overlapped sample between the financial data and the biodiversity risk data includes 32,814 firm-year observations, in which there are 3,002 unique firms. Note that each variable has its own missing data; therefore, depending on each model (e.g., with or without control variables, or with one lead of the dependent variable), the number of observations will be different. We provide more details of descriptive statistics and observations for all variables of the main results in the next section. To reduce the influence of outliers, continuous variables are winsorized at the 1st and 99th percentiles.

[6]We are grateful to Stefano Giglio, Johannes Stroebel, Theresa Kuchler, and Xuran Zeng for their kindness in sharing the data on their website at https://www.biodiversityrisk.org/.

3.2 Variables

3.2.1 Dependent Variables

Following the literature on corporate debt maturity (González, 2015; Dang and Phan, 2016; Fu et al., 2022; Li and Zhang, 2019; Freund et al., 2023), we calculate and create three short-term debt measures: i) *1-year Maturity Debt* is the ratio of debt that has a maturity of less than one year over the firm's total debt, ii) *2-year Maturity Debt* is the ratio of debt that has a maturity of less than two years over the firm's total debt, and iii) *3-year Maturity Debt* is the ratio of debt that has a maturity of less than three years over the firm's total debt. The literature on debt maturity does not provides specific justifications for which maturity cut-offs are more preferable (Li and Zhang, 2019). To alleviate concerns about the reliance on arbitrary thresholds for these measures, our robustness tests explore alternative metrics by considering the percentages of debt set to mature within four and five years (Dang and Phan, 2016; Li and Zhang, 2019).[7]

3.2.2 Explanatory Variables

Our explanatory variable is *Biodiversity Risk* at the firm level, constructed by Giglio et al. (2023). Giglio et al. (2023) develop a biodiversity-related dictionary and utilize U.S. firms' annual 10-Ks to quantify firm-level biodiversity risk, which is a dummy variable that equals one if the 10-K report contains at least two sentences related to biodiversity, and zero otherwise.

In our robustness tests, we also employ two other measures developed by Giglio et al. (2023), including *Biodiversity Negative Sentiment* and *Biodiversity Regulation Risk*. While *Biodiversity Negative Sentiment* captures the negative over positive sentiments of each biodiversity sentence, *Biodiversity Regulation Risk* proxies the risks that firms may bear under the possible future regulations regarding the use and protection of forest, timberlands, or endangered species. Due to the construction, a negative value of *Biodiversity Negative Sentiment* represents a more pessimistic view of biodiversity, while a positive one indicates the firm are more optimistic about

[7] Compustat only provides the maturity information of short-term debt up to five years.

biodiversity. *Biodiversity Regulation Risk* is a dummy variable that equals one if a biodiversity-related sentence refers to concerns about biodiversity regulations, and zero otherwise. By nature, *Biodiversity Risk* captures overall firms' concerns on biodiversity risks, while the last two measures focus on different specific aspects. Therefore, they may not necessarily exhibit exactly the same impact on corporate debt maturity choices.

3.2.3 Control Variables

In line with the literature on corporate debt maturity (González, 2015; Dang and Phan, 2016; Fu et al., 2022; Li and Zhang, 2019; Freund et al., 2023), we include commonly used determinants. First, we control for *Firm Size* defined as the natural logarithm of total assets. Evidently, large firms can benefit from economies of scale and are often subject to less information asymmetry than small firms (Custódio et al., 2013; Johnson, 2003; Li and Zhang, 2019). Therefore, large firms can access longer-term debt more easily, and take advantage of large scale of economies to reduce flotation costs (Barclay et al., 2003). Second, *Firm Age* is included as another control variable, which is computed as the natural logarithm of the number of years from the first time the firm is covered by the Compustat database. Firm age proxies the firm's profile and experience, which determine the choices of debt maturity (Choi et al., 2018).

To capture firms' sales and profitability, we includes returns on assets (*ROA*) (i.e., earnings before interest, taxes, depreciation and amortization scaled by total assets) and *Sale Growth* (i.e., total sales in year t minus total sales in year t-1, and divided by total sales in year t-1). Due to significant tax benefits, profitable firms prefer long-term debt to short-term debt (Deesomsak et al., 2009; Fan et al., 2012). Next, we control corporate investments and growth opportunities by including the ratio of capital expenditures to total assets (*Capital expenditures*) and *Tobin's Q*. Information asymmetry often increases when firms have more investments and growth opportunities; thus they are not able to access long-term debt (Barclay and Smith Jr, 1995; Wu et al., 2022). Trade credit (i.e., *Payables*) and inventory management (i.e., *Inventory*) also affect corporate financing decisions (Love et al., 2007; Hu, 2017; Duong et al., 2025). Firms

with low dividend payout policy and a high level of cash flow (i.e., *Dividend per Share* and *Cash Flow*) tend to shorten their debt maturity Ross et al. (1998); Morris (1976). Finally, financial constraints (i.e., *WW Index* proposed by Whited and Wu (2006)) can hinder firms from long-term debt issuance (Dang and Phan, 2016).

3.3 Model Specification

To study the effects of biodiversity risk on corporate debt maturity choices, our paper closely follows prior research in this literature (Fu et al., 2022; Li and Zhang, 2019; Dang and Phan, 2016) and write our model specification as follows.

$$\text{Short-term debt}_{i,t+1} = \alpha + \beta \text{Biodiversity Risk}_{i,t} + \zeta \mathbb{X}_{i,t} + \lambda_{j\times t} + \varepsilon_{i,t}, \tag{1}$$

where *Short-term debt*$_{i,t+1}$ is one of our three short-term debt measures, that are *1-year Maturity Debt*, *2-year Maturity Debt*, and *3-year Maturity Debt* for firm i in year t+1. *Biodiversity Risk*$_{i,t}$ indicates whether firm i in year t disclose at least two sentences regarding their concerns about biodiversity risks on its 10-K report. β is our coefficient of interest. ζ is a vector that contains the coefficients for our set of control variables $\mathbb{X}_{i,t}$, which includes *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Tobin's Q*, *Payables*, *Inventory*, *Cash Flow*, *Dividend per Share*, and *WW Index*. $\lambda_{j\times t}$ indicates industry $\times$ year fixed effects control for unobserved industry-year-variant factors.[8] $\varepsilon_{i,t}$ is a mean-zero error term. In our specification, the standard errors are clustered at the firm-year level.

[8] Strebulaev (2007) and Leary and Roberts (2005) document that corporate capital structure are not frequently rebalanced. It implies that debt maturity structure can be hardly changed within a firm for several years. Therefore, our specification does not use firm fixed effects.

4 Empirical Results

4.1 Descriptive Statistics

On average, among U.S. firms, roughly 16.50% of total debt is due within one year, 24.50% is due within two years, and 33.70% is due within three years. These means of short-term debt are similar to prior research (Dang and Phan, 2016; Li and Zhang, 2019; Brockman et al., 2010). Also, in line with Giglio et al. (2023), there are 3.9% of U.S. firms disclosing their concerns about biodiversity risks on their 10-K statements. Our control variables perform largely similar statistics to previous studies (Dang and Phan, 2016; Li and Zhang, 2019; Brockman et al., 2010; Fan et al., 2012). Specifically, the mean values of *ROA*, *Sale Growth*, *Payables*, and *Dividend per Share* are 0.104, 0.143, 0.155, and 0.479, respectively. We present all descriptive statistics of our variables in Table 1.

[Table 1 Here]

Correlations between variables are reported in Table 2. Overall, *Biodiversity Risk* is negatively correlated with all short-maturity debt measures. While *Firm Size*, *Firm Age*, *Capital expenditures* are positively correlated with *Biodiversity Risk*, there is a negative correlation between *Biodiversity Risk* and *Tobin's Q*. As supported by existing literature (Dang and Phan, 2016), *WW Index* is positively associated with all short-term debt measures.

[Table 2 Here]

4.2 Baseline Results

We present our baseline results from the regression Equation (1) in Table 3. We test the impact of *Biodiversity Risk* on short-maturity debt due within one year (in Columns 1-2), within two years (in Columns 3-4), and within three years (in Columns 5-6). Across the columns with or without control variables, the estimated coefficients of *Biodiversity Risk* are negative and statistically significant at 1%. In terms of economic magnitude, for example, relative to non-exposed firms, firms with biodiversity risk exposure tend to reduce *1-year Maturity Debt*, *2-year*

Maturity Debt, and *3-year Maturity Debt* by 3.1% (Column 2), 3.6% (Column 4), and 2.6% (Column 6), respectively. Our results are economically significant as compared to the means of the short-term debt measures, equivalent to a reduction in *1-year Maturity Debt* by 18.79%, *2-year Maturity Debt* by 13.47%, and *3-year Maturity Debt* by 7.72%.

[Table 3 Here]

The baseline results support our hypothesis that firms exposed to biodiversity risks tend to use less short-maturity debt. These firms may aim to avoid additional risks linked with short-term debt, such as refinancing risk, debt renegotiation risk, transaction costs, and the potential for asset mis-liquidation (Li et al., 2025; Huang et al., 2024; Froot et al., 1993; Brunnermeier and Yogo, 2009). On one hand, they face significant declines in operational and financial performance due to biodiversity-related challenges. On the other hand, they must comply with government policies aimed at protecting biodiversity and maintaining their reputation. Consequently, raising more long-term debt appears to be a more viable option for these firms in the long run when coping with biodiversity risks.

We also conduct tests for the heterogeneous effects of biodiversity risk on short-term debt across primary industries, as shown in Figure 1. Panels (a), (b), and (c) of Figure 1 present the estimated industry-specific coefficients for one-year, two-year, and three-year short-term debt maturities, respectively. The results reveal notable variation in the sensitivity of different sectors to biodiversity risk. Across all three panels, the transportation, utilities, coal, petroleum & natural gas sectors exhibit consistently negative coefficients, with some estimates being statistically significant at the 90% or 95% confidence levels. These findings suggest that firms in these industries are particularly vulnerable to biodiversity-related disclosures, potentially due to their higher environmental footprint, regulatory exposure, or investor scrutiny. The sustained negative effects across multiple debt maturities further indicate that biodiversity concerns may influence both immediate and slightly longer-term financing decisions in these sectors.

Conversely, industries such as entertainment, services, and construction show coefficients that

are statistically insignificant. This implies that biodiversity risk has a limited or no discernible effect on their short-term debt structure. The impacts of biodiversity risks are more observable in the agriculture & food/beverage sectors in one-year short term debt.

Overall, these heterogeneous effects emphasize the importance of considering sector-specific attributes when analyzing the financial implications of biodiversity risk. The varying magnitudes and significance levels across industries suggest that the materiality of biodiversity disclosures is not uniform but rather contingent on the nature of firms' operations and their environmental interactions.

[Figure 1 Here]

4.3 Robustness tests

In this section, we conduct a number of robustness tests to deal with endogeneity issues. First, we employ the coefficient stability test suggested by Oster (2019) to check if our model specification exhibits any selection bias due to omitted variables. Second, to prove that being exposed to biodiversity risks is not random, we conduct two approaches: propensity score matching and randomizing the biodiversity risk exposure. Overall, our robustness tests show that there is no issue with omitted variables, and that the effect of biodiversity risks on firms' debt maturity is indeed a causal relationship.

4.3.1 Endogeneity: Unobservable variables

In the baseline regressions, we have attempted to include a set of control variables to isolate the impact of biodiversity risks from firm-specific characteristics. However, one may argue that there may be unobservable variables that may drive the results. To deal with such an issue of omitted variables, we conduct coefficient stability tests proposed by Oster (2019). Oster (2019)'s test helps to measure the magnitude of selection bias due to omitted variables. We present the Oster (2019)'s δ statistic in Table 3, where δ values are greater than one, except Column 6 with the value very close to one. The Oster (2019)'s δ statistic indicates the significance

of unobserved confounders compared to observed control variables in negating the primary results. Thus, according to Oster (2019), δ above one demonstrates that there is no significant concern about the selection bias due to unobservable variables. The bias-adjusted coefficient β^* is computed to capture the impact of biodiversity risks on corporate debt maturity, assuming all unobserved confounding factors are taken into account in the regression. In Table 3, the intervals between β^* and the baseline coefficient do not include zero. These results support the conclusion that the findings are not predominantly influenced by unobserved confounding variables.

We also conduct robustness tests using different fixed effects. In the online Appendix, we present the results with firm and year fixed effects in Table A1, while Table A2 reports the results with state fixed effects and industry $\times$ year fixed effects. Using firm fixed effects, we find that the negative impact of biodiversity risk on one-year short-term debt is significant at the 10% level, whereas the impact of biodiversity risk on two-year and three-year short-term debt is negative but not statistically significant. This may indicate that the unobserved variance could be more at the industry level. Note that, as our main variable—*Biodiversity Risk* is a dummy variable, once a firm mentions biodiversity risk in its reports, it often continues to do so. Therefore, at the firm level, there may be limited variance. In contrast, using state fixed effects allows for a broader control of state-level heterogeneity. We also include other state-level factors in Table A2 of the online Appendix, including *State GDP* (i.e., the logarithm of state gross domestic product) and *State Consumption* (i.e., the logarithm of state consumption per capita). The results in Table A2 are robust and in line with our baseline results.

4.3.2 Propensity Score Matching

The status of being exposed to biodiversity risks may not be random and may be driven by the firm's characteristics. Also, to prove the causal impact of biodiversity risks on firms' short-term debt maturities, we use the propensity score matching approach (PSM) in this section. This PSM method considers biodiversity-risk-exposed firms as the treatment group,

while non-exposed firms are regarded as the control group. In Table 4, Column 1 (Biodiversity Risk (Pre-Match)) shows the result of a logistic regression, in which the dependent variable is *Biodiversity Risk*. We obtain the probabilities (propensity scores) of how likely a firm is exposed to biodiversity risks in this Pre-Match stage. To test if the changes in corporate debt maturities are primarily due to biodiversity risks, we need to match firms that have similar characteristics between two groups, using the above propensity scores from the Pre-Match regression. We employ the nearest neighbor matching for firms in the treatment and control groups with the exact industry and year. We require stricter matching by using a caliper value of 0.001. To check if the success of our PSM matching, we conduct a diagnostic test (Column 2 - Post-Match), where we re-estimate the logistic regression in Column 1 but only for the matched sample. Consequently, while several firm-level characteristics affect the *Biodiversity Risk* in Column 1, the matched sample demonstrates that no distinguishable differences in the observable firm-level characteristics between two groups in Column 2.

The primary advantage of the Propensity Score Matching (PSM) approach is that it constructs a matched sample comprising firms from the two groups that exhibit similar characteristics. This alignment helps mitigate potential endogeneity concerns related to firm-specific factors. Utilizing this matched sample, we re-estimate our baseline regressions, as presented in Columns 3-5. Our analysis confirms that the baseline results remain robust and consistent.

[Table 4 Here]

4.3.3 Placebo Tests

This section considers whether the corporate disclosure of being exposed to biodiversity risks may be mistakenly measured. We randomly assign the values of one or zero among the firms as *Biodiversity Risk (Placebo)* from a uniform distribution. We re-estimate Equation 1 using *Biodiversity Risk (Placebo)* and conduct the estimations 1,000 times.

[Figure 2 Here]

Figure 2 illustrates the distribution of the estimates for the *Biodiversity Risk (Placebo)* in

Panel A (for *1-year Maturity Debt*), Panel B (for *2-year Maturity Debt*), and Panel C (for *3-year Maturity Debt*). Overall, there is no instance where the *Biodiversity Risk (Placebo)* is precisely estimated. The estimates using actual data are presented in red lines. These results indicate that our baseline results are not driven by a random draw of *Biodiversity Risk*.

4.4 Mechanisms

In this section, we examine a number of mechanisms that can mitigate the adverse impact of biodiversity risks on short-term debt. They include firm size, the geographical diversification in outsourcing, and government-related business relationships.

4.4.1 Large versus Small Firms

The literature has shown that firm size can affect the firms' choices of debt maturities. Larger firms often leverage their scale economies to secure long-term debt, even when faced with substantial flotation costs (Barclay and Smith Jr, 1995). This suggests that accessing long-term debt is relatively easier for large firms compared to their smaller counterparts. Furthermore, Bharath et al. (2011) demonstrate that larger firms benefit from a broader range of financing options. In addition to financial flexibility, larger firms are better positioned to access diverse resources, which can mitigate various external risks. For instance, the ability to navigate biodiversity risks may be greater than that of smaller firms, resulting in less severe reductions in short-term debt among large firms.

[Table 5 Here]

Table 5 presents the results for the role of firm size. To capture this effect, we construct a dummy variable, *Firm Size Above Median*, which takes the value of one if a firm's total assets (measured as the natural logarithm of total assets) exceed the median total assets within its industry, and zero otherwise. We interact *Firm Size Above Median* with *Biodiversity Risk*, and find that the estimated coefficients of the interaction term are positive and significant at 1%, implying that larger firm size indeed mitigates the negative impact of biodiversity risks on

short-term debt.

The impact of biodiversity risk on debt maturity choices can also be explained through the channel of resource scarcity, which interacts closely with firm size. Biodiversity loss can lead to disruptions in the availability of natural resources essential for production, increasing cost volatility and operational uncertainty. Such conditions make it riskier for firms to commit to short-term debt, which requires more frequent refinancing and exposes firms to greater liquidity pressures. Larger firms, however, tend to be more resilient in the face of resource scarcity due to their broader supplier networks, stronger bargaining power, and access to substitute inputs. These capabilities allow them to better absorb shocks and maintain stable financing structures. This mechanism helps explain our empirical finding in Table 5, where the interaction term between *Firm Size Above Median* and *Biodiversity Risk* is positive and statistically significant. The result suggests that large firms are indeed more capable of mitigating the adverse effect of biodiversity risk on short-term debt usage, in part because they are better equipped to navigate the resource constraints brought about by biodiversity-related disruptions.

4.4.2 Geographical offshoring Diversification

Prior research documents that diversifying input sources on an international scale can significantly enhance firms' product development and innovation (Massini and Miozzo, 2012). Furthermore, Jain and Wu (2023) and Brandon-Jones et al. (2017) show that U.S. firms that engage in reshoring benefit from improved profitability and increased shareholder value, particularly during periods of geopolitical risk. Specifically, firms that diversify their suppliers across multiple countries are better equipped to mitigate the adverse impact of economic policy uncertainty (Charoenwong et al., 2023). This strategic diversification approach not only ensures supply chain resilience but also fosters greater stability in uncertain environments.

[Table 6 Here]

In the context of biodiversity risks, firms may encounter challenges such as shortages of natural resources required for their operations and production processes in local regions. Engaging in

offshoring activities—sourcing inputs from overseas across multiple countries—can help mitigate these risks. By diversifying their supply chains geographically, firms can leverage access to alternative resources and reduce their reliance on any single location, thereby offsetting the adverse effects of biodiversity-related disruptions. We test the mitigating role of geographical offshoring diversification in the impact of biodiversity risks on short-term debt, and present the results in Table 6. We use data of offshoring activities from the study of Hoberg and Moon (2017),[9] which uses firms' 10-K reports to track the countries where U.S. firms purchase inputs. We count the number of overseas input countries for each U.S. firm each year, and create a variable named *Input Country Count*. The coefficients of the interaction term between *Input Country Count* and *Biodiversity Risk* is our interest. Despite the overall negative impact of biodiversity risks, the geographical offshoring diversification can alleviate such an impact on short-term debt. Except Column 1, the interaction term's coefficients are positive and significant at 5%.

A key mechanism through which biodiversity risks influence firms' debt maturity choices is resource scarcity, especially in regions facing ecological degradation or habitat loss. Localized biodiversity disruptions can cause severe supply shortages, price volatility, and operational instability—factors that increase liquidity risks and discourage reliance on short-term debt. However, firms engaged in geographical offshoring diversification are better positioned to manage these risks by accessing inputs from multiple countries. This strategic spread of sourcing activities reduces dependence on any single location, enabling firms to buffer the impact of resource constraints and maintain greater financing flexibility. Our empirical results in Table 6 reinforce this mechanism: the interaction term between *Input Country Count* and *Biodiversity Risk* is positive and statistically significant in most specifications, indicating that firms with higher levels of offshoring diversification experience a weaker negative effect of biodiversity risk on short-term debt. These findings suggest that resource scarcity plays a central role in the biodiversity-financing relationship and that international diversification is an effective risk mitigation tool in this context.

[9]Data can be found at https://faculty.marshall.usc.edu/Gerard-Hoberg/HobergMoonDataSite/index.html.

4.4.3 Government-related Business Relationships

Government procurement plays a crucial role in reducing risks for firms that supply to government agencies. There is sufficient evidence on the benefits of government-related business ties in the literature. For example, Huang et al. (2016) suggest that the possession of government relationships is often associated with lower default risks and longer-term contracts. Therefore, having the government as a major customers lower cash flow volatility, financial distress risk, and the need for maintaining excess cash reserves. Dhaliwal et al. (2016) find that governments rarely switch suppliers, making them loyal, long-term customers for specific firms. This stability enhances firms' financial resilience and reputation, facilitating access to lower cost of capital, including private equity and venture capital (Paglia and Harjoto, 2014). Moreover, government procurement acts as a mechanism for directing government innovation funding into corporate activities, driving technological progress and business growth.

Government procurement can help firms address biodiversity risks in a number of ways. By incorporating sustainability criteria into procurement policies, governments encourage firms to adopt environmentally responsible practices, which can mitigate the impact of biodiversity loss on their operations. Additionally, government contracts provide financial stability through steady revenue streams Huang et al. (2016), reducing the financial uncertainty firms face when dealing with resource shortages or supply chain disruptions caused by biodiversity risks. Firms with government contracts may also benefit from an enhanced reputation for reliability and sustainability, strengthening relationships with investors and customers who prioritize environmental responsibility Flammer (2018). With this strong reputation in government business partnerships, firms can mitigate the impact of biodiversity risks and have more access to diverse financing sources, reducing concerns about debt maturity and ensuring financial stability even in the face of environmental uncertainties.

[Table 7 Here]

To examine the role of government contracting, we collect data from the Compustat - Cus-

tomer Segments database. We count the number of government agencies with which firms have business relationships. These government agencies include both local and state governments.[10] We then interact the *Government Contracting Count* with *Biodiversity Risk* and present the results in Table 7. As anticipated, the *Government Contracting Count* mitigates the negative impact of biodiversity risks on short-term debt, as evidenced across Columns 1-3 in Table 7.

One key channel through which biodiversity risks influence firms' debt maturity choices is resource scarcity, which can lead to operational disruptions, cost volatility, and liquidity stress. These challenges are particularly pronounced when firms experience raw material shortages or supply chain breakdowns due to ecosystem degradation. However, firms engaged in government-related business relationships are better positioned to withstand such pressures. Stable and predictable government procurement contracts can provide firms with revenue certainty, reducing their exposure to short-term refinancing risk when facing biodiversity-induced supply disruptions. This financial buffer allows firms to maintain or extend their debt maturities, alleviating the need to rely on short-term borrowing under uncertain conditions. Our empirical results in Table 7 support this mechanism: the interaction term between *Government Contracting Count* and *Biodiversity Risk* is positive and significant, indicating that firms with greater government business exposure experience a weaker negative effect of biodiversity risk on short-term debt. These findings imply that government-related stability plays a vital role in insulating firms from the financial consequences of biodiversity-related resource constraints.

4.5 Additional Tests

In this section, we further investigate whether alternative measures of biodiversity risks, such as those capturing sentiment and regulatory factors, influence short-term debt choices. Finally, we employ alternative measures of 1-year maturity debt and investigate whether biodiversity risks affect debt maturing within 4 and 5 years.

[10] In untabulated results, we separately estimate the effects of local and state government contracting. We find that local government contracting has a significant impact on the association between biodiversity risks and corporate debt maturity, whereas state government contracting does not show a significant effect.

4.5.1 Other Biodiversity Risk Types

As explained in Section 3.2.2, we use two other measures: *Biodiversity Negative Sentiment* and *Biodiversity Regulation Risk* and study how they influence on corporate short-term debt. While *Biodiversity Negative Sentiment* reflects a firm's sentiment toward biodiversity, *Biodiversity Regulation Risk* focuses on the firm's concerns regarding biodiversity-related regulations. Given the distinct nature, these measures may perform different impacts on short-term debt decisions. We present the results in Table 8, where Columns 1-3 use *Biodiversity Negative Sentiment* and Columns 4-6 employ *Biodiversity Regulation Risk* as the main explanatory variables. Overall, both types of biodiversity risks or sentiments negatively impact short-term debt maturity. However, the magnitude of the impact of *Biodiversity Regulation Risk* is greater than that of *Biodiversity Negative Sentiment*, suggesting that firms place greater emphasis on concerns related to biodiversity regulations.

[Table 8 Here]

4.5.2 Other Debt Maturity

In this section, we utilize an alternative measure of short-term debt maturing within one year. Following the literature Dang and Phan (2016); Li and Zhang (2019), *1-year Maturity Debt (Alternative)* is defined as the ratio of debt in current liabilities, excluding the current portion of long-term debt, to total debt. This measure more strictly excludes the current portion of long-term debt from current liabilities. The results for this *1-year Maturity Debt (Alternative)* are presented in Column 1 of Table 9. Additionally, we examine the impact of biodiversity risks on *4-year Maturity Debt* (Column 2) and *5-year Maturity Debt* (Column 3) in Table 9. Consistent with our baseline results, biodiversity risks are found to negatively affect all short-term debt measures.

[Table 9 Here]

5 Conclusion

Biodiversity risks have posed significant challenges to businesses, impacting their operations, financial performance, and strategic planning (Li et al., 2025; Huang et al., 2024). These risks often stem from ecosystem degradation, resource scarcity, and heightened regulatory and societal pressures to address environmental concerns. Firms may face shortages of raw materials or natural resources critical to their production processes, leading to operational disruptions and supply chain vulnerabilities. Additionally, compliance with biodiversity regulations and conservation efforts can increase operational costs, while stricter regulations or penalties for non-compliance further strain profitability. Ignoring biodiversity concerns may harm a firm's reputation, diminish customer trust, and restrict access to market opportunities. From a financial perspective, these risks can result in cash flow instability, increased borrowing costs, and limited access to funding, as investors and lenders increasingly prioritize environmentally conscious businesses.

This paper examines the impact of biodiversity risks on firms' short-term debt decisions. Our findings reveal that firms exposed to biodiversity risks tend to reduce their reliance on short-term debt. These results align with cost theory, risk theory, and institutional theory, which suggest that firms aim to minimize the additional risks associated with short-term debt. We also find that large firm size, geographical offshoring activities, and government contracting play significant roles in mitigating the negative impact of biodiversity risks. These findings provide valuable insights for policymakers and governments in designing strategies and policies to support firms in managing biodiversity-related challenges effectively.

Our findings also have practical implications for corporate managers, investors, and policymakers. For management, proactively addressing biodiversity risks can serve not only as a risk mitigation strategy but also as a lever for value creation. Firms should integrate biodiversity considerations into enterprise risk management frameworks, supply chain due diligence, and long-term financing strategies. Enhancing transparency through biodiversity-related disclosures can also improve stakeholder engagement and align with emerging ESG (Environmental,

Social, and Governance) standards. For investors, the study underscores the relevance of biodiversity risk as a material factor in credit risk assessment and portfolio construction. Investors may consider incorporating biodiversity metrics into their due diligence processes and engaging with firms on their biodiversity performance and disclosure practices. For policymakers, these insights highlight the importance of establishing supportive regulatory environments that incentivize biodiversity stewardship while minimizing unintended financial burdens on firms. This may include developing biodiversity taxonomies, encouraging standardized reporting, providing financial instruments for adaptation (e.g., green bonds), and fostering collaborations between public institutions and the private sector. In particular, the establishment of government-backed biodiversity risk subsidy funds could help firms offset the immediate financial costs associated with biodiversity-related investments and compliance. Public financing programs that de-risk private sector efforts may further encourage firms to adopt proactive biodiversity strategies. Overall, a coordinated effort among these stakeholders is essential to promote sustainable finance and mitigate the systemic risks posed by biodiversity loss.

While this study provides important insights, it is not without limitations. First, the measure of biodiversity risk employed in this paper is relatively coarse, relying on a binary indicator that may not fully capture the intensity or scope of biodiversity-related exposures. This limitation is particularly salient in models with firm fixed effects, where within-firm variation is limited due to the "stickiness" of biodiversity risk—once a firm discloses such risks, it often continues to do so, thereby reducing the explanatory power of fixed-effects models. Second, the analysis is based on data from firms within a single national context, which may limit the generalizability of our findings across different institutional, regulatory, and ecological environments. Future research would benefit from the development of more granular and dynamic measures of biodiversity risk, as well as cross-country comparative studies to strengthen the external validity of the results and provide a broader understanding of how biodiversity risks affect corporate financial decisions in diverse settings.

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Table 1: Descriptive Statistics

	Obs.	Mean	Std.	P25	P50	P75
1-year Maturity Debt	28,005	0.165	0.245	0.013	0.065	0.195
2-year Maturity Debt	28,005	0.245	0.287	0.032	0.139	0.331
3-year Maturity Debt	28,005	0.337	0.320	0.072	0.241	0.499
Biodiversity Risk	32,790	0.039	0.193	0.000	0.000	0.000
Firm Size	32,790	7.335	1.762	6.018	7.228	8.527
Firm Age	32,790	3.876	0.146	3.754	3.886	4.009
ROA	32,771	0.104	0.140	0.072	0.118	0.170
Sale Growth	32,664	0.143	0.376	-0.006	0.078	0.196
Capital expenditures	32,723	0.049	0.050	0.017	0.033	0.061
Dividend per Share	32,790	0.479	0.854	0.000	0.000	0.650
Tobin's Q	32,739	2.259	1.635	1.254	1.691	2.591
Inventory	32,425	0.103	0.107	0.013	0.085	0.151
Payables	32,678	0.155	0.188	0.069	0.112	0.166
Cash Flow	30,616	0.057	0.121	0.039	0.074	0.111
WW Index	30,505	-0.342	0.101	-0.412	-0.340	-0.272

Notes: This table presents descriptive statistics of variables in our main analysis. Details of variable construction and definitions are presented in Appendix A.

Table 2: Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) 1-year Maturity Debt	1.00														
(2) 2-year Maturity Debt	0.82***	1.00													
(3) 3-year Maturity Debt	0.65***	0.81***	1.00												
(4) Biodiversity Risk	-0.06***	-0.07***	-0.07***	1.00											
(5) Firm Size	-0.22***	-0.24***	-0.24***	0.10***	1.00										
(6) Firm Age	-0.15***	-0.17***	-0.15***	0.07***	0.27***	1.00									
(7) ROA	-0.06***	-0.05***	-0.04***	-0.01	0.22***	-0.05***	1.00								
(8) Sale Growth	0.04***	0.02***	0.00	0.00	-0.13***	-0.05***	-0.09***	1.00							
(9) Capital expenditures	-0.07***	-0.05***	-0.05***	0.16***	0.00	-0.14***	0.16***	0.06***	1.00						
(10) Dividend per Share	-0.06***	-0.07***	-0.09***	0.06***	0.43***	0.22***	0.20***	-0.11***	-0.01*	1.00					
(11) Tobin's Q	0.10***	0.07***	0.05***	-0.08***	-0.16***	0.11***	-0.02***	0.18***	-0.06***	0.01*	1.00				
(12) Inventory	0.06***	0.06***	0.05***	-0.04***	-0.07***	-0.00	-0.05***	-0.04***	-0.18***	-0.02***	-0.07***	1.00			
(13) Payables	-0.01**	-0.01**	-0.02***	0.06***	0.06***	0.02**	-0.08***	0.12***	0.19***	-0.03***	0.09***	0.00	1.00		
(14) Cash Flow	-0.05***	-0.04***	-0.02***	0.00	0.21***	-0.03***	0.91***	-0.09***	0.16***	0.04***	-0.10***	-0.04***	-0.06***	1.00	
(15) WW Index	0.19***	0.20***	0.20***	-0.09***	-0.91***	-0.22***	-0.36***	0.33***	-0.01	-0.53***	0.20***	0.05***	0.00	-0.33***	1.00

Notes: This table presents correlations for all variables of our main analysis. Details of variable construction and definitions are presented in Appendix A. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Table 3: Baseline Results: *Biodiversity Risk* and *Debt Maturity*

	1-year Maturity Debt		2-year Maturity Debt		3-year Maturity Debt	
	(1)	(2)	(3)	(4)	(5)	(6)
Biodiversity Risk	-0.038***	-0.031***	-0.043***	-0.036***	-0.044***	-0.026***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.008)	(0.008)
Firm Size		-0.038***		-0.049***		-0.049***
		(0.003)		(0.004)		(0.004)
Firm Age		-0.207		-0.071		-0.248
		(0.482)		(0.563)		(0.611)
ROA		-0.277***		-0.300***		-0.196***
		(0.039)		(0.045)		(0.053)
Sale Growth		0.002		-0.001		-0.010
		(0.006)		(0.007)		(0.008)
Capital expenditures		-0.124***		-0.103**		-0.100*
		(0.038)		(0.047)		(0.051)
Dividend per Share		0.015***		0.017***		0.014***
		(0.002)		(0.002)		(0.003)
Tobin's Q		0.010***		0.005***		-0.002
		(0.001)		(0.002)		(0.002)
Inventory		0.054***		0.048**		0.048*
		(0.021)		(0.024)		(0.025)
Payables		0.001		0.022*		0.018
		(0.010)		(0.012)		(0.013)
Cash Flow		0.231***		0.257***		0.207***
		(0.042)		(0.049)		(0.059)
WW Index		-0.283***		-0.370***		-0.261***
		(0.060)		(0.072)		(0.073)
Constant	0.160***	1.138	0.238***	0.747	0.330***	1.578
	(0.001)	(1.868)	(0.002)	(2.183)	(0.002)	(2.369)
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-squared	0.059	0.084	0.059	0.084	0.056	0.084
Obs.	24,836	23,310	24,836	23,310	24,836	23,346
Oster (2019) δ for $\beta = 0$		1.667		1.554		0.998
Oster (2019) bound (β, β^*)		(-0.075, -0.031)		(-0.092, -0.036)		(-0.102, -0.026)

Notes: This table presents our baseline results, considering the impact of *Biodiversity Risk* on corporate short-term debt. *1-year Maturity Debt* is the ratio of short-term debt (less than one year to maturity) to the firm's total debt. *2-year Maturity Debt* is the ratio of short-term debt (less than two years to maturity) to the firm's total debt. *3-year Maturity Debt* is the ratio of short-term debt (less than three years to maturity) to the firm's total debt. *Biodiversity Risk* is a dummy variable set to one if the 10-K filing includes two or more sentences referencing biodiversity, and zero if it does not. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Industry × year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. The Oster (2019)'s δ statistic illustrates the significance of unmeasured variables compared to measured control variables in negating the primary results. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Table 4: Robustness Tests: Propensity Score Matching

	Biodiversity Risk (Pre-Match)	Biodiversity Risk (Post-Match)	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt
	(1)	(2)	(3)	(4)	(5)
Biodiversity Risk			-0.039***	-0.035***	-0.030**
			(0.008)	(0.011)	(0.013)
Firm Size	0.240***	0.115	-0.003	-0.016	-0.040**
	(0.054)	(0.118)	(0.009)	(0.012)	(0.017)
Firm Age	-11.282	-18.895	-0.143	-0.738	-1.381
	(9.853)	(26.343)	(1.938)	(3.206)	(3.467)
ROA	-0.947	-0.990	-0.155	-0.223	-0.270
	(0.941)	(1.790)	(0.233)	(0.266)	(0.349)
Sale Growth	0.127	-0.011	-0.021	-0.002	-0.003
	(0.116)	(0.231)	(0.018)	(0.024)	(0.032)
Capital expenditures	5.180***	1.172	-0.280**	-0.422***	-0.246
	(0.645)	(1.281)	(0.112)	(0.143)	(0.187)
Dividend per Share	-0.154***	-0.083	0.008	0.008	0.011
	(0.050)	(0.085)	(0.006)	(0.007)	(0.010)
Tobin's Q	-0.172***	-0.099	0.012*	0.009	0.006
	(0.055)	(0.081)	(0.007)	(0.009)	(0.010)
Inventory	-1.346***	-0.533	-0.004	-0.101	-0.075
	(0.435)	(0.786)	(0.071)	(0.093)	(0.103)
Payables	0.212	-0.234	-0.018	0.025	0.026
	(0.150)	(0.298)	(0.021)	(0.032)	(0.043)
Cash Flow	-0.012	0.802	0.235	0.244	0.100
	(1.025)	(2.009)	(0.266)	(0.294)	(0.385)
WW Index	1.369	1.174	0.240	0.015	-0.339
	(1.090)	(2.320)	(0.205)	(0.250)	(0.346)
Constant	44.312	68.347	0.813	3.245	5.911
	(40.447)	(95.796)	(7.594)	(12.565)	(13.591)
Industry × Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.224	0.020			
Adj R-squared			0.200	0.155	0.159
Obs.	23,497	1,320	1,320	1,320	1,320

Notes: This table presents results for the impact of *Biodiversity Risk* on corporate short-term debt under the propensity score matching method. Column 1 (Pre-Match) performs a logistic regression, where the outcome variable is *Biodiversity Risk*. We obtain propensity scores from the Pre-Match estimation, and use them to match firms between treatment group (firms with biodiversity risks) and control group (firms without biodiversity risks), using the nearest neighbor matching for firms in the treatment and control groups with the exact industry and year. We require stricter matching by using a caliper value of 0.001. We re-conduct the logistic regression in Column 2 (Post-Match). After matching, we obtain a matched sample and re-estimate our baseline regressions in Columns 3-5. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Industry × year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Table 5: Mechanism: Does firm size matter to the impact of *Biodiversity Risk* on *Debt Maturity*?

	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt
	(1)	(2)	(3)
Biodiversity Risk × Firm Size Above Median	0.052***	0.057***	0.062***
	(0.009)	(0.013)	(0.016)
Biodiversity Risk	-0.063***	-0.071***	-0.076***
	(0.008)	(0.012)	(0.014)
Firm Size Above Median	-0.055***	-0.074***	-0.090***
	(0.004)	(0.005)	(0.006)
Firm Age	-0.219	-0.089	-0.387
	(0.482)	(0.563)	(0.618)
ROA	-0.243***	-0.257***	-0.204***
	(0.038)	(0.045)	(0.053)
Sale Growth	-0.019***	-0.027***	-0.037***
	(0.006)	(0.007)	(0.007)
Capital expenditures	-0.119***	-0.098**	-0.079
	(0.038)	(0.047)	(0.053)
Dividend per Share	0.018***	0.021***	0.016***
	(0.002)	(0.002)	(0.003)
Tobin's Q	0.010***	0.005***	-0.000
	(0.001)	(0.002)	(0.002)
Inventory	0.057***	0.053**	0.053**
	(0.021)	(0.024)	(0.026)
Payables	-0.004	0.016	0.012
	(0.010)	(0.012)	(0.013)
Cash Flow	0.239***	0.266***	0.242***
	(0.042)	(0.049)	(0.059)
Constant	1.085	0.685	1.963
	(1.867)	(2.183)	(2.397)
Industry × Year FE	Yes	Yes	Yes
Adj R-squared	0.084	0.084	0.085
Obs.	23,310	23,310	23,310

Notes: This table presents our results, considering the role of firm size on the impact of *Biodiversity Risk* on corporate short-term debt. *1-year Maturity Debt* is the ratio of short-term debt (less than one year to maturity) to the firm's total debt. *2-year Maturity Debt* is the ratio of short-term debt (less than two years to maturity) to the firm's total debt. *3-year Maturity Debt* is the ratio of short-term debt (less than three years to maturity) to the firm's total debt. *Biodiversity Risk* is a dummy variable set to one if the 10-K filing includes two or more sentences referencing biodiversity, and zero if it does not. *Firm Size Above Median* takes the value of one if a firm's total assets (measured as the natural logarithm of total assets) exceed the median total assets within its industry, and zero otherwise. The coefficients of *Biodiversity Risk* × *Firm Size Above Median* are our interest. Other control variables include *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Industry × year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Table 6: Mechanism: The role of geographical offshoring diversification for the relationship between *Biodiversity Risk* on *Debt Maturity*

	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt
	(1)	(2)	(3)
Biodiversity Risk × Input Country Count	0.001	0.002**	0.004***
	(0.001)	(0.001)	(0.001)
Biodiversity Risk	-0.038***	-0.048***	-0.058***
	(0.007)	(0.010)	(0.012)
Input Country Count	0.001***	0.001***	0.001**
	(0.000)	(0.000)	(0.000)
Firm Size	-0.042***	-0.061***	-0.073***
	(0.004)	(0.005)	(0.005)
Firm Age	-0.830	-0.320	-0.457
	(0.563)	(0.654)	(0.708)
ROA	-0.384***	-0.406***	-0.342***
	(0.049)	(0.057)	(0.070)
Sale Growth	-0.003	-0.004	-0.006
	(0.008)	(0.009)	(0.010)
Capital expenditures	-0.115**	-0.109**	-0.056
	(0.046)	(0.055)	(0.061)
Dividend per Share	0.017***	0.018***	0.013***
	(0.003)	(0.003)	(0.004)
Tobin's Q	0.017***	0.011***	0.005*
	(0.002)	(0.003)	(0.003)
Inventory	0.037	0.023	0.017
	(0.026)	(0.030)	(0.033)
Payables	-0.007	0.016	0.007
	(0.012)	(0.015)	(0.016)
Cash Flow	0.294***	0.317***	0.279***
	(0.055)	(0.064)	(0.078)
WW Index	-0.342***	-0.514***	-0.636***
	(0.077)	(0.089)	(0.101)
Constant	3.511	1.738	2.418
	(2.149)	(2.495)	(2.699)
Industry × Year FE	Yes	Yes	Yes
Adj R-squared	0.083	0.084	0.086
Obs.	17,077	17,077	17,077

Notes: This table presents our results, considering the role of geographical offshoring diversification on the impact of *Biodiversity Risk* on corporate short-term debt. *1-year Maturity Debt* is the ratio of short-term debt (less than one year to maturity) to the firm's total debt. *2-year Maturity Debt* is the ratio of short-term debt (less than two years to maturity) to the firm's total debt. *3-year Maturity Debt* is the ratio of short-term debt (less than three years to maturity) to the firm's total debt. *Biodiversity Risk* is a dummy variable set to one if the 10-K filing includes two or more sentences referencing biodiversity, and zero if it does not. *Input Country Count* is the total number of countries where U.S. firms purchase inputs. The coefficients of *Biodiversity Risk* × *Input Country Count* are our interest. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Industry × year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Table 7: Mechanism: The role of Government Contracting for the relationship between *Biodiversity Risk* on *Debt Maturity*

	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt
	(1)	(2)	(3)
Biodiversity Risk × Government Contracting Count	0.095***	0.089**	0.064*
	(0.035)	(0.036)	(0.038)
Biodiversity Risk	-0.037***	-0.041***	-0.041***
	(0.005)	(0.006)	(0.008)
Government Contracting Count	-0.008***	-0.009***	-0.006**
	(0.002)	(0.002)	(0.003)
Firm Size	-0.038***	-0.049***	-0.055***
	(0.003)	(0.004)	(0.004)
Firm Age	-0.195	-0.058	-0.354
	(0.482)	(0.563)	(0.617)
ROA	-0.279***	-0.302***	-0.251***
	(0.039)	(0.045)	(0.054)
Sale Growth	0.002	-0.001	-0.009
	(0.006)	(0.007)	(0.008)
Capital expenditures	-0.128***	-0.107**	-0.085
	(0.038)	(0.047)	(0.053)
Dividend per Share	0.015***	0.017***	0.012***
	(0.002)	(0.002)	(0.003)
Tobin's Q	0.010***	0.005***	-0.001
	(0.001)	(0.002)	(0.002)
Inventory	0.053**	0.047**	0.047*
	(0.021)	(0.024)	(0.026)
Payables	-0.000	0.021*	0.018
	(0.010)	(0.012)	(0.013)
Cash Flow	0.234***	0.259***	0.234***
	(0.042)	(0.049)	(0.060)
WW Index	-0.291***	-0.377***	-0.391***
	(0.060)	(0.072)	(0.082)
Constant	1.094	0.698	1.990
	(1.868)	(2.183)	(2.394)
Industry × Year FE	Yes	Yes	Yes
Adj R-squared	0.086	0.085	0.083
Obs.	23,310	23,310	23,310

Notes: This table presents our results, considering the role of government contracting on the impact of *Biodiversity Risk* on corporate short-term debt. *1-year Maturity Debt* is the ratio of short-term debt (less than one year to maturity) to the firm's total debt. *2-year Maturity Debt* is the ratio of short-term debt (less than two years to maturity) to the firm's total debt. *3-year Maturity Debt* is the ratio of short-term debt (less than three years to maturity) to the firm's total debt. *Biodiversity Risk* is a dummy variable set to one if the 10-K filing includes two or more sentences referencing biodiversity, and zero if it does not. *Government Contracting Count* is number of government agencies with which firms have business relationships. The coefficients of *Biodiversity Risk* × *Government Contracting Count* are our interest. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Industry × year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Table 8: Additional Tests: Other *Biodiversity Risk Types*

	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt
	(1)	(2)	(3)	(4)	(5)	(6)
Biodiversity Negative Sentiment	-0.009***	-0.012***	-0.012*			
	(0.003)	(0.005)	(0.006)			
Biodiversity Regulation Risk				-0.029***	-0.038***	-0.035***
				(0.005)	(0.007)	(0.010)
Firm Size	-0.038***	-0.049***	-0.055***	-0.038***	-0.049***	-0.055***
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
Firm Age	-0.195	-0.057	-0.348	-0.214	-0.081	-0.371
	(0.482)	(0.563)	(0.617)	(0.482)	(0.563)	(0.618)
ROA	-0.275***	-0.298***	-0.247***	-0.276***	-0.299***	-0.248***
	(0.039)	(0.045)	(0.054)	(0.039)	(0.045)	(0.054)
Sale Growth	0.002	-0.001	-0.009	0.002	-0.001	-0.009
	(0.006)	(0.007)	(0.008)	(0.006)	(0.007)	(0.008)
Capital expenditures	-0.132***	-0.111**	-0.091*	-0.126***	-0.104**	-0.084
	(0.038)	(0.047)	(0.053)	(0.038)	(0.047)	(0.053)
Dividend per Share	0.015***	0.017***	0.012***	0.015***	0.017***	0.012***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
Tobin's Q	0.010***	0.005***	-0.001	0.010***	0.005***	-0.001
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Inventory	0.055***	0.050**	0.050*	0.054***	0.048**	0.048*
	(0.021)	(0.024)	(0.026)	(0.021)	(0.024)	(0.026)
Payables	0.000	0.021*	0.018	0.001	0.022*	0.018
	(0.010)	(0.012)	(0.013)	(0.010)	(0.012)	(0.013)
Cash Flow	0.231***	0.257***	0.232***	0.231***	0.256***	0.232***
	(0.042)	(0.049)	(0.060)	(0.042)	(0.049)	(0.060)
WW Index	-0.286***	-0.374***	-0.389***	-0.286***	-0.373***	-0.388***
	(0.060)	(0.072)	(0.082)	(0.060)	(0.072)	(0.082)
Constant	1.090	0.692	1.966	1.162	0.786	2.055
	(1.868)	(2.183)	(2.394)	(1.868)	(2.183)	(2.394)
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-squared	0.084	0.083	0.083	0.084	0.084	0.083
Obs.	23,310	23,310	23,310	23,310	23,310	23,310

Notes: This table presents results for the effects of different biodiversity risk measures on short-term debt. In Columns 1-3, we use *Biodiversity Negative Sentiment*, which is defined as the negative over positive sentiments of each biodiversity sentence in the firm's 10-K report. In Columns 4-6, we use *Biodiversity Regulation Risk*, which is a dummy variable that equals one if a biodiversity-related sentence refers to concerns about biodiversity regulations, and zero otherwise. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Industry × year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

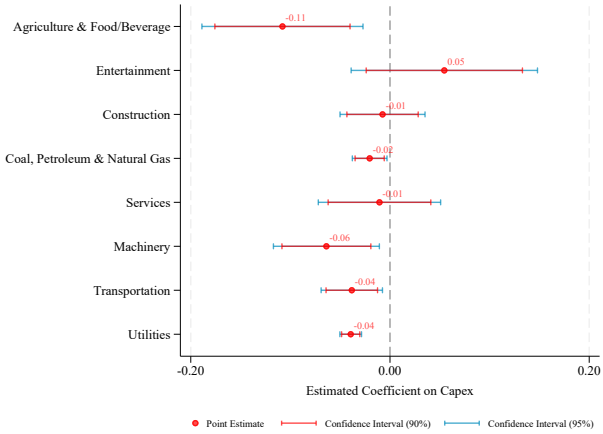
Table 9: Additional Tests: Other *Debt Maturity Measures*

	1-year Maturity Debt (Alternative)	4-year Maturity Debt	5-year Maturity Debt
	(1)	(2)	(3)
Biodiversity Risk	-0.019***	-0.025***	-0.022**
	(0.003)	(0.009)	(0.010)
Firm Size	-0.012***	-0.052***	-0.047***
	(0.002)	(0.005)	(0.005)
Firm Age	-1.089***	-1.048	-0.901
	(0.365)	(0.673)	(0.692)
ROA	-0.008	-0.113*	-0.001
	(0.026)	(0.061)	(0.061)
Sale Growth	-0.002	-0.016*	-0.015
	(0.004)	(0.009)	(0.009)
Capital expenditures	-0.032	-0.054	0.029
	(0.027)	(0.059)	(0.061)
Dividend per Share	0.006***	0.001	-0.012***
	(0.001)	(0.003)	(0.003)
Tobin's Q	0.001	-0.008***	-0.012***
	(0.001)	(0.002)	(0.002)
Inventory	0.115***	0.051*	0.056*
	(0.016)	(0.029)	(0.030)
Payables	-0.004	0.008	0.001
	(0.007)	(0.015)	(0.015)
Cash Flow	0.036	0.179***	0.114*
	(0.027)	(0.067)	(0.066)
WW Index	-0.161***	-0.369***	-0.255***
	(0.047)	(0.092)	(0.094)
Constant	4.298***	4.762*	4.294
	(1.416)	(2.610)	(2.684)
Industry × Year FE	Yes	Yes	Yes
Adj R-squared	0.041	0.061	0.069
Obs.	22,339	23,310	23,310

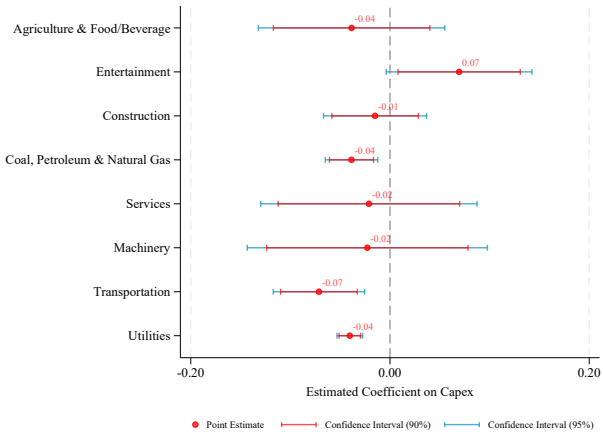
Notes: This table presents results for the effects of *Biodiversity Risk* on *1-year Maturity Debt (Alternative)* (Column 1), *4-year Maturity Debt* (Column 2), and *5-year Maturity Debt* (Column 3). *Biodiversity Risk* is a dummy variable that equals one if the 10-K report contains at least two sentences related to biodiversity, and zero otherwise. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Industry × year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Figure 1: Heterogeneous Effects of Biodiversity Risk across Sectors

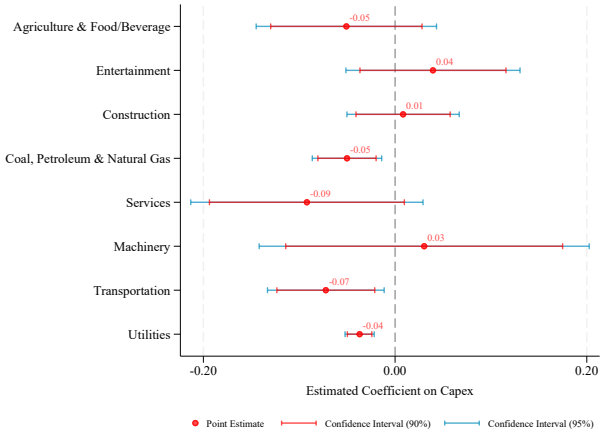
(a) 1-year Maturity Debt



(b) 2-year Maturity Debt



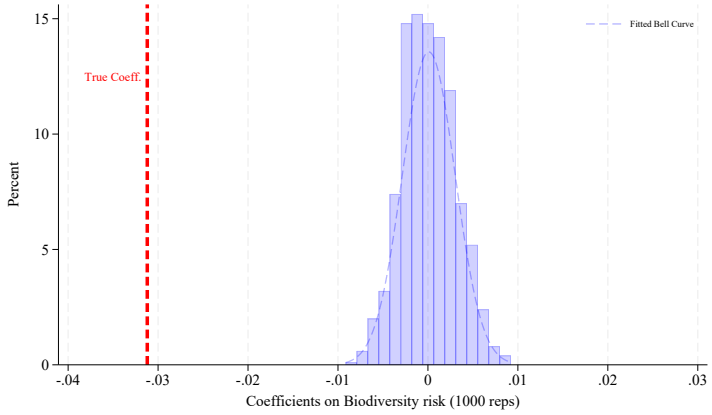
(c) 3-year Maturity Debt



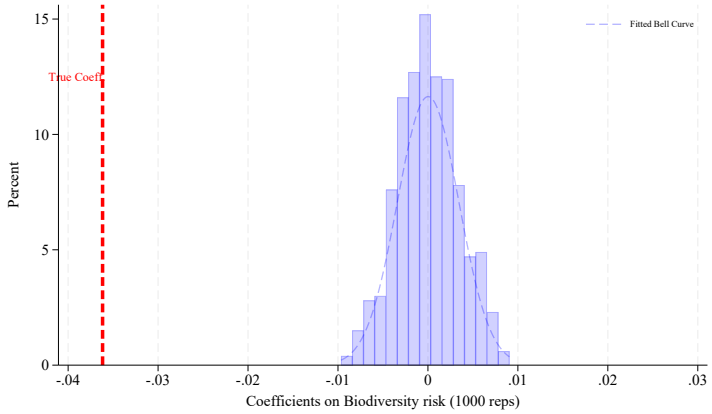
Note: This figure the estimated coefficient of Biodiversity Risk across industries of interest. We also include the control variables for all estimations. Standard error are clustered at firm-year level.

Figure 2: Estimates using Randomized Biodiversity Risk

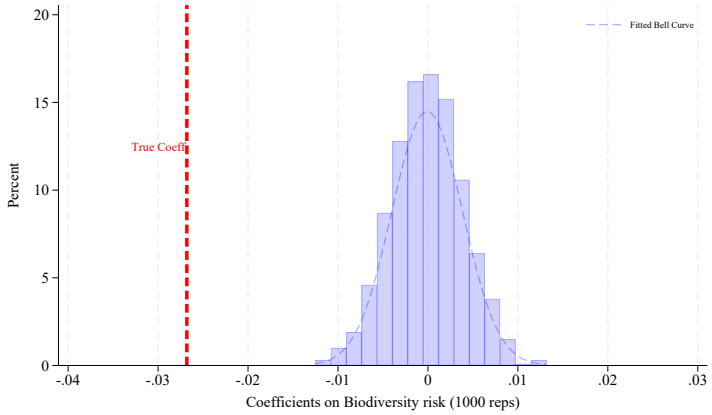
Panel A: Randomized Biodiversity Risk and 1-year Maturity Debt



Panel B: Randomized Biodiversity Risk and 2-year Maturity Debt



Panel C: Randomized Biodiversity Risk and 3-year Maturity Debt



Note: Instead of using the actual *Biodiversity Risk*, we randomize the values of one and zero, using a uniform distribution to create *Biodiversity Risk (Placebo)*. We repeat the exercise 1,000 replications and report the distribution of the estimated coefficients on *Biodiversity Risk (Placebo)*. The true estimates using actual *Biodiversity Risk* from our baseline results are overlaid as a red vertical line in each panel. We conduct the placebo tests for *1-year Maturity Debt* in Panel A, *2-year Maturity Debt* in Panel B, and *3-year Maturity Debt* in Panel C.

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Appendix A. Variable Definitions

Variables	Definitions	Sources
1-year Maturity Debt	The ratio of short-term debt (less than one year to maturity) to the firm's total debt obligations	Compustat
2-year Maturity Debt	The ratio of short-term debt (less than two years to maturity) to the firm's total debt obligations	Compustat
3-year Maturity Debt	The ratio of short-term debt (less than three years to maturity) to the firm's total debt obligations	Compustat
Biodiversity Risk	A dummy variable set to one if the 10-K filing includes two or more sentences referencing biodiversity, and zero if it does not.	Giglio et al. (2023)
Firm Size	The natural logarithm of total assets	Compustat
Firm Age	The natural logarithm of the number of years from the first time the firm is covered by Compustat	Compustat
ROA	The ratio of earnings before interest, taxes, depreciation and amortization divided to total assets	Compustat
Sale Growth	Total sales in year t minus total sales in year t-1, and divided by total sales in year t-1	Compustat
Capital expenditures	The ratio of capital expenditures to total assets	Compustat
Dividend per Share	Cash dividends divided by the number of shares outstanding	Compustat
Tobin's Q	The sum of total assets and market values minus common equity, divided by total assets	Compustat
Inventory	Inventory divided by total assets	Compustat
Payables	Payables accounts divided by cost of goods	Compustat
Cash Flow	The operating income before depreciation minus interest expense minus income taxes minus cash dividends, then divided by total assets	Compustat
WW Index	Following Whited and Wu (2006), it is obtained by -0.091 $\times$ Cash flow - 0.062 $\times$ Dividend dummy + 0.021 $\times$ Long-term debt - 0.044 $\times$ Firm Size + 0.102 $\times$ Industry sales growth - 0.035 $\times$ Sale Growth	Compustat

Online Appendix

Table A1: Firm fixed effects: *Biodiversity Risk* and *Debt Maturity*

	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt
	(1)	(2)	(3)
Biodiversity Risk	-0.011*	-0.007	-0.003
	(0.006)	(0.008)	(0.010)
Firm Size	-0.033***	-0.038***	-0.047***
	(0.005)	(0.006)	(0.007)
Firm Age	-2.363	-1.437	-2.141
	(1.536)	(1.905)	(2.151)
ROA	-0.057	-0.028	0.062
	(0.039)	(0.048)	(0.061)
Sale Growth	-0.003	-0.013*	-0.018**
	(0.006)	(0.007)	(0.008)
Capital expenditures	-0.142***	-0.135**	-0.155**
	(0.047)	(0.058)	(0.068)
Dividend per Share	0.001	0.002	-0.003
	(0.002)	(0.003)	(0.003)
Tobin's Q	-0.001	-0.009***	-0.015***
	(0.002)	(0.002)	(0.003)
Inventory	-0.085**	-0.038	-0.011
	(0.039)	(0.045)	(0.051)
Payables	-0.008	0.006	-0.021
	(0.015)	(0.019)	(0.020)
Cash Flow	0.087**	0.082*	0.000
	(0.040)	(0.048)	(0.063)
WW Index	-0.001	0.051	-0.009
	(0.061)	(0.082)	(0.092)
Constant	9.589	6.144	9.026
	(5.957)	(7.390)	(8.343)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adj R-squared	0.410	0.348	0.307
Obs.	23,070	23,070	23,070

Notes: This table presents our baseline results, considering the impact of *Biodiversity Risk* on corporate short-term debt. *1-year Maturity Debt* is the ratio of short-term debt (less than one year to maturity) to the firm's total debt. *2-year Maturity Debt* is the ratio of short-term debt (less than two years to maturity) to the firm's total debt. *3-year Maturity Debt* is the ratio of short-term debt (less than three years to maturity) to the firm's total debt. *Biodiversity Risk* is a dummy variable set to one if the 10-K filing includes two or more sentences referencing biodiversity, and zero if it does not. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. Firm and year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.

Table A2: State fixed effects: *Biodiversity Risk* and *Debt Maturity*

	1-year Maturity Debt	2-year Maturity Debt	3-year Maturity Debt
	(1)	(2)	(3)
Biodiversity Risk	-0.032***	-0.038***	-0.038***
	(0.005)	(0.007)	(0.008)
Firm Size	-0.039***	-0.049***	-0.054***
	(0.003)	(0.004)	(0.004)
Firm Age	-0.236	-0.038	-0.332
	(0.489)	(0.570)	(0.627)
ROA	-0.261***	-0.281***	-0.231***
	(0.039)	(0.045)	(0.054)
Sale Growth	0.002	-0.001	-0.009
	(0.006)	(0.007)	(0.008)
Capital expenditures	-0.146***	-0.135***	-0.113**
	(0.039)	(0.047)	(0.054)
Dividend per Share	0.015***	0.017***	0.013***
	(0.002)	(0.002)	(0.003)
Tobin's Q	0.008***	0.003**	-0.002
	(0.001)	(0.002)	(0.002)
Inventory	0.054***	0.053**	0.057**
	(0.021)	(0.024)	(0.026)
Payables	-0.001	0.021*	0.018
	(0.010)	(0.012)	(0.013)
Cash Flow	0.222***	0.246***	0.223***
	(0.042)	(0.049)	(0.059)
WW Index	-0.287***	-0.366***	-0.375***
	(0.060)	(0.073)	(0.083)
State GDP	-0.027	-0.044	-0.035
	(0.032)	(0.036)	(0.040)
State Consumption	0.064	0.170**	0.202**
	(0.069)	(0.080)	(0.088)
Constant	0.944	-0.571	0.251
	(2.000)	(2.334)	(2.574)
State FE	Yes	Yes	Yes
Industry x Year FE	Yes	Yes	Yes
Adj R-squared	0.092	0.090	0.087
Obs.	23,277	23,277	23,277

Notes: This table presents our baseline results, considering the impact of *Biodiversity Risk* on corporate short-term debt. *1-year Maturity Debt* is the ratio of short-term debt (less than one year to maturity) to the firm's total debt. *2-year Maturity Debt* is the ratio of short-term debt (less than two years to maturity) to the firm's total debt. *3-year Maturity Debt* is the ratio of short-term debt (less than three years to maturity) to the firm's total debt. *Biodiversity Risk* is a dummy variable set to one if the 10-K filing includes two or more sentences referencing biodiversity, and zero if it does not. Our control variables include *Firm Size*, *Firm Age*, *ROA*, *Sale Growth*, *Capital expenditures*, *Dividend per Share*, *Tobin's Q*, *Inventory*, *Payables*, *Cash Flow*, and *WW Index*. Details of variable construction and definitions are presented in Appendix A. We also include two state-level factors: *State GDP* and *State Consumption* in this table. State fixed effects and Industry x year fixed effects are included. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance is denoted as follows: * for p-values less than 0.10, ** for p-values less than 0.05, and *** for p-values less than 0.01.