

### Biodiversity Risk

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#### KEY RECOMMENDATIONS

- In order to properly protect their operations, profits and the environment, businesses should both understand how exposed they are to biodiversity risks and invest in sustainable practices that minimize biodiversity loss.
- To understand their exposure level, it is recommended that businesses regularly monitor and report how their activities affect the biodiversity of the areas where they operate, both directly and indirectly (i.e.: impacts through third party companies, suppliers and consumers). It is also important that these data are aligned with emerging standards and regulations.

#### RESEARCH SUMMARY

##### Background and Objectives

Over the past decade, there has been an increasing focus on understanding how our economy and the environment interact. Much of this research has explored how climate change affects economic activity and asset values. But climate change is only one dimension of the feedback loops between the economy and the health of our planet. The paper studies a different and equally important dimension: the economic risks associated with biodiversity loss.

Its key questions include: can we quantify biodiversity risk? How does it differ from climate risk? And is biodiversity risk already reflected in asset prices?

First, it is important to define biodiversity risk. Humans rely on biodiversity – defined here as the sum total of genes, species, and ecosystems – to survive and thrive. For example, diverse ecosystems are key to the production of food, while many medicines are derived from natural compounds found in plants, animals, and microorganisms. The recent losses of ecosystem services have been estimated to cause damages of USD 4 trillion to USD 20 trillion per year.

##### Methodology

Despite its importance, biodiversity risk has been understudied in economics and finance research in part due to its complexity and the challenges in measuring it. The paper systematically measures aggregate biodiversity risk and releases several measures of how exposed firms and industries are to these risks, based on information such as firms' 10-K statements (i.e., their annual reports).

These measures generally line up with investors' views about biodiversity risks and they are also reflected in asset prices. In general, biodiversity is a concern for the public. A broad, global survey of the perceptions of biodiversity risks among finance academics, professionals, public sector regulators, and policy economists was conducted. Around 70% of respondents perceived physical and transition biodiversity risks to have at least moderate financial materiality for firms in the US, with private sector respondents reporting the highest perceived financial materiality.

The paper also analyzed the news coverage around biodiversity in the New York Times, from 2000 to 2022, to better understand when bad news about biodiversity risks occurs. It presents a corresponding news index to capture periods of bad news about climate change to explore

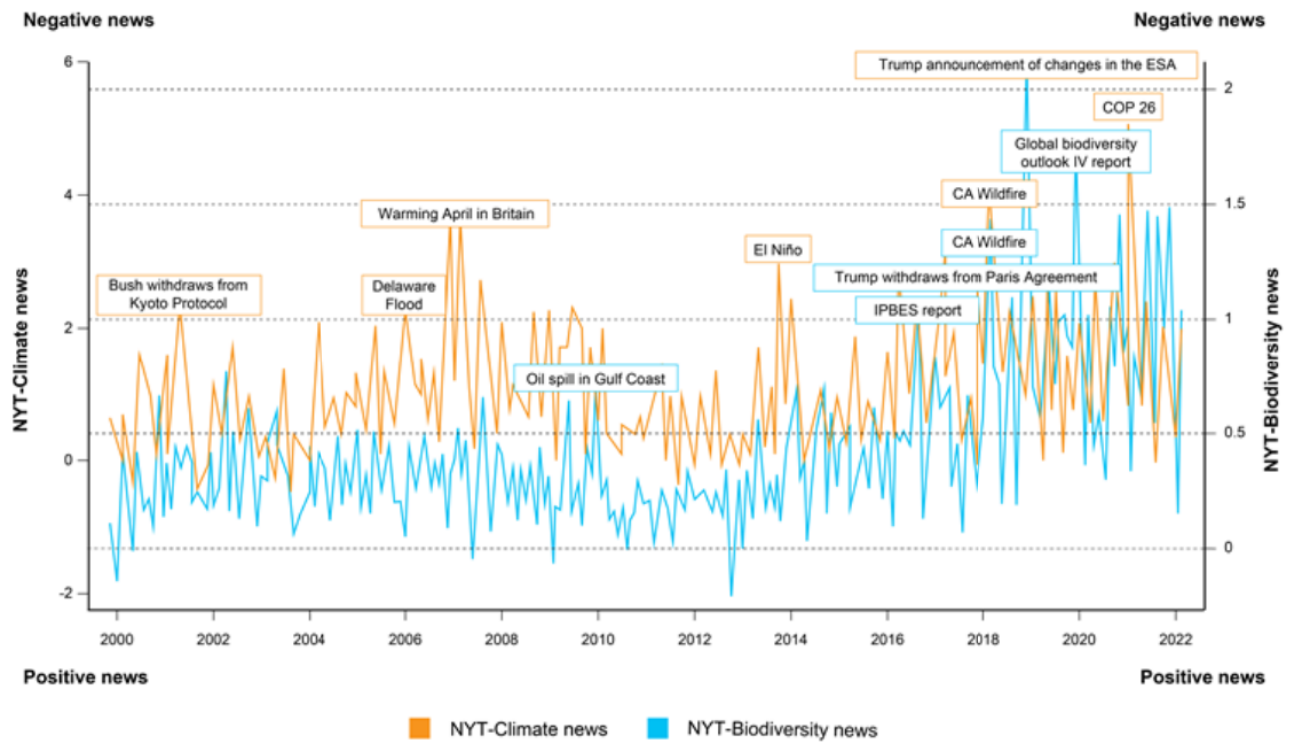


Figure 1: NYT-Biodiversity News Index vs. Google-Biodiversity Attention Index

commonalities and differences in climate and biodiversity risk realizations. The conclusion, as shown in Figure 1, was that negative biodiversity-related news events (e.g., Trump’s announcement of changes in the Endangered Species Act, or the oil spill in the Gulf Coast) did not generally coincide with spikes in the climate news index, while negative climate-related news events (e.g., Bush’s withdrawal from the Kyoto Protocol, or a Delaware flood) did not result in spikes in the biodiversity news index. There are some common events (e.g., wildfires), but the overall correlation between the two indices is low, suggesting that risks from biodiversity-related and climate-related events are distinct and therefore need to be studied and understood independently.

### Different industries are affected in different proportions

A few interesting conclusions can be drawn from the study. First, as shown in Figure 2, it is clear that different sectors vary in their dependence on natural capital, which links to their physical biodiversity risk exposure. They also differ in terms of their effects on the environment, and therefore

their regulatory biodiversity risk exposures. For example, energy companies mention being exposed to biodiversity transition risks related to drilling and refining activities, which can affect the ecosystem and are potentially a target for future regulations. Utility firms face regulations on species and habitat protection, and the real estate industry faces restrictions on developments in areas with high biodiversity. Firms also report facing physical biodiversity risks, including pharmaceutical companies relying on biodiversity for drug discovery.

In short, sectors with the highest biodiversity risk exposures include energy, utilities, and real estate, while semiconductor, software, and communication services sectors have minimal exposures.

### Biodiversity risks are already incorporated in equity prices

The paper also explored whether equity prices reflect biodiversity risk exposures. To do this, a portfolio of long positions in industries with low biodiversity risk exposures was created, as well as a portfolio of short positions in industries with high

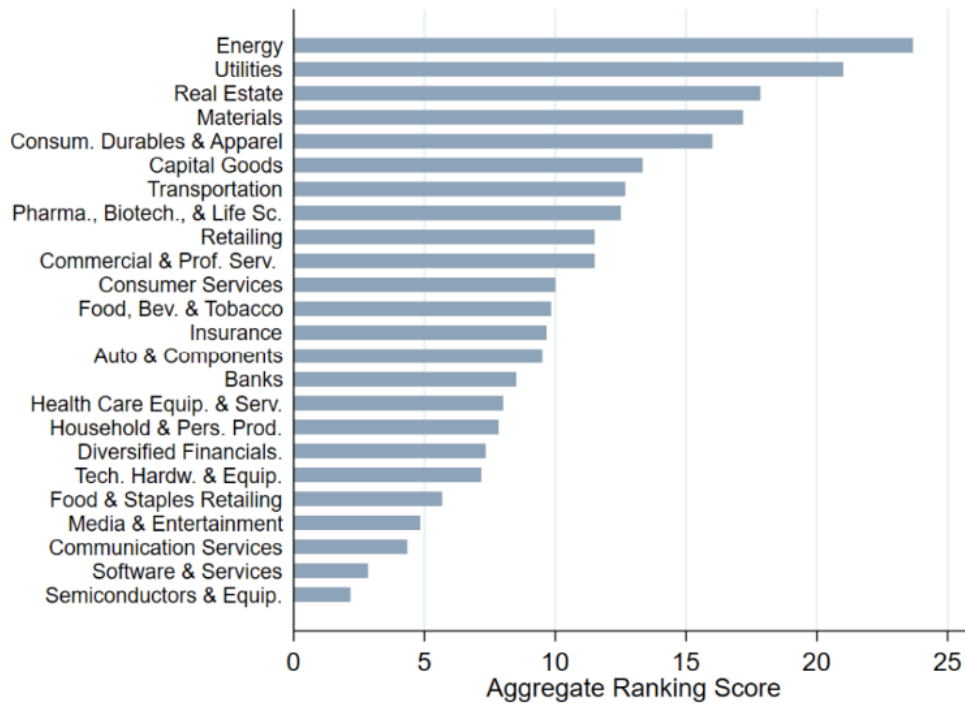


Figure 2: Industry-level biodiversity risk exposure

biodiversity risk exposures.

If biodiversity risk is priced in, the return of these portfolios should covary with innovations in the aggregate biodiversity news index, behaving like a hedging portfolio. And that is what happened, as the study found a positive correlation between the returns of the biodiversity hedging portfolios and innovations in the biodiversity risk index, indicating that biodiversity risk has been at least partially priced in equities over the past decade.

**POLICY IMPLICATIONS**

There are a few potential implications for policymakers that can be inferred from the paper and that can foment the preservation of biodiversity. First, regulators should develop guidelines for standardized biodiversity risk disclosure by businesses, and even the obligation by companies to publish this data. This will ensure that these risks are better understood and accounted for throughout the world.

Governments can also create financial incentives for businesses adopting biodiversity-friendly practices. A lot is discussed to reduce carbon and GHG emissions, and similar policies could be

designed to protect ecosystems and the life forms within them. They can also enhance funding for research and conservation initiatives addressing biodiversity loss.

**ABOUT THE AUTHORS**

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**ADDITIONAL RESOURCES**

1. <https://www.oecd-ilibrary.org/sites/45adbd0e-en/index.html?itemId=/content/component/45adbd0e-en>
2. [www.biodiversityrisk.org](http://www.biodiversityrisk.org)
3. [https://www.eeas.europa.eu/eeas/biodiversity-risk-were-part-problem-and-part-solution\\_en](https://www.eeas.europa.eu/eeas/biodiversity-risk-were-part-problem-and-part-solution_en)