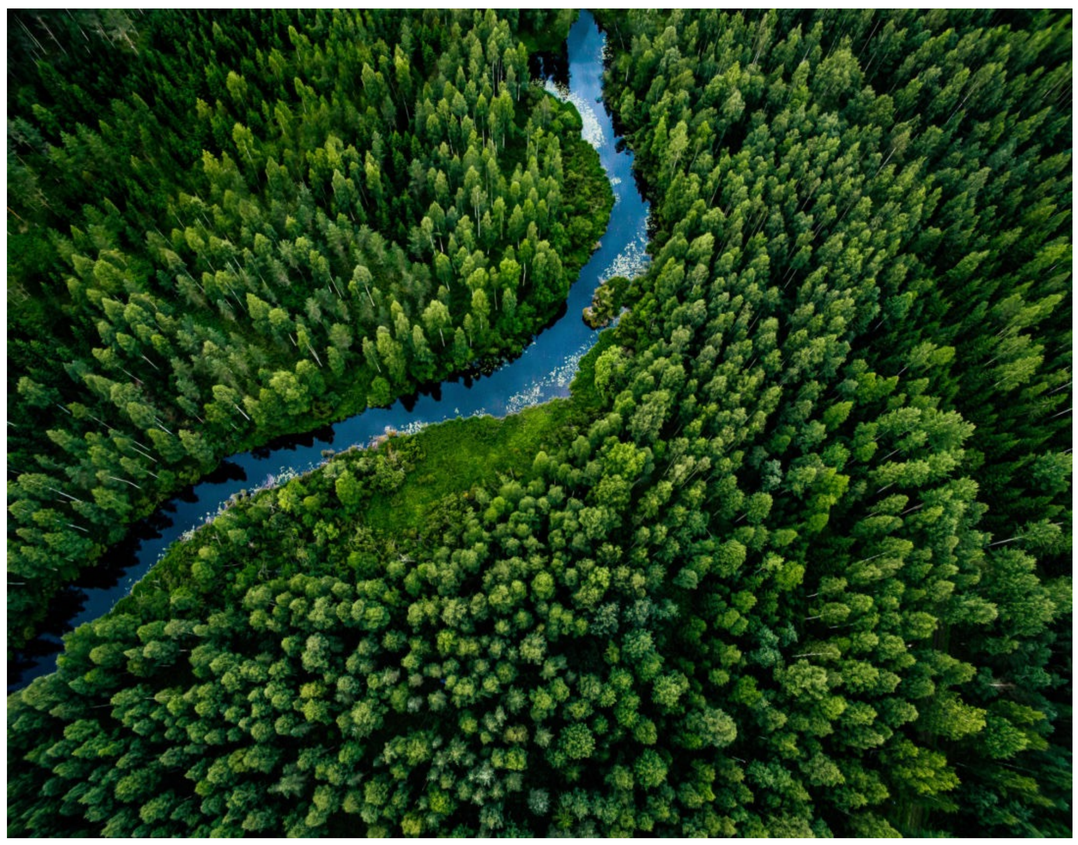
Biodiversity Risk, Firm Performance, and Market Mispricing



MOTIVATION

Since the last decade, people have been increasingly focusing on solving the problems of climate change and global warming. However, the body of scientific evidence supports the statement that the biodiversity issues are equally important. Despite some papers discussing biodiversity transition risk, the physical risks of biodiversity loss and its pricing are still understudied due to its complexity.

RESEARCH QUESTION

- How can we quantify the long-term biodiversity physical risk?
- Is this biodiversity physical risk reflected in the asset prices?
- And, if not, what leads to the asset mispricing?

METHODOLOGY

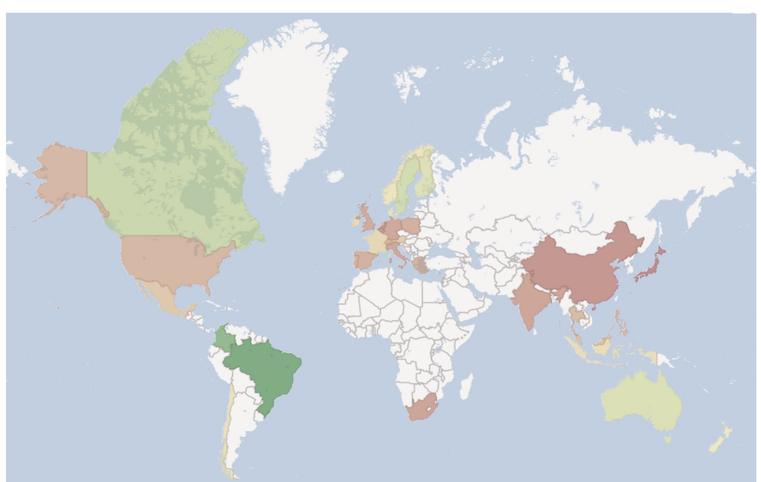
- We use a AR(1) time series model with a unique time terms to capture the long-run biodiversity physical risk exposure across globe.
- We use OLS regression + Firm controls + FE to predict the relation between biodiversity physical risk exposure and stock returns and firms' profitability.
- We also split firms by sectors to identify the sector-level risk exposure.

DATA

Biodiversity data
- Time period : 1961-2020 with yearly frequency
- Spatial level : 35 countries around the world

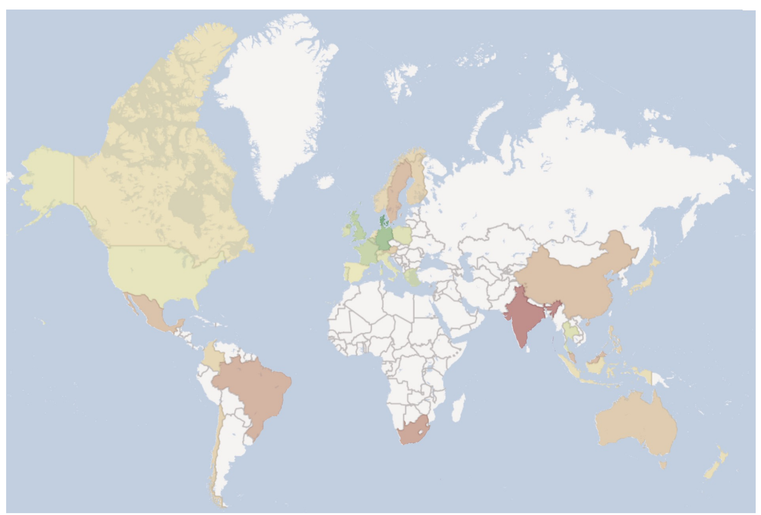
Firm data
- Time period : 2000-2021 with yearly frequency
- Observations : 120 681 firm-year observations

We match biodiversity and firm level data using the information of headquarter locations.



Biodiversity Overall Status

From 2000 to 2020



Average Biodiversity physical risk exposure

From 2000 to 2020

KEY RESULTS

- Our biodiversity physical risk is heterogeneous across countries and regions.
- Biodiversity physical risk has not yet been priced in equity markets.
- Investors inefficiently incorporate the future cash flow information into asset prices, which leads to the predictability of stock returns.
- Firms attributed to biodiversity-sensitive industries (e.g., Agriculture and Pharmacy) are more exposed.

RELATED LITERATURE

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- Giglio, S., Kuchler, T., Stroebel, J., & Zeng, X. (2023). *Biodiversity risk*. National bureau of economic research working papers.
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