

# PHYSICAL RISKS, CARBON MARKETS BIODIVERSITY

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Risks Forum 2022

# Paper Discussion n°1

**Impacts of extreme weather events on mortgage risks and their evolution under climate change: A case study on Florida** (September 2021)

**Authors:** Raffaella Calabrese, Timothy Dombrowski, Antoine Mandel, R. Kelley Pace, Luca Zanin

# Research question

- ▶ “Climate change could impact the soundness of financial institutions and pose a threat to global financial stability” (Carney, 2015)
- ▶ Despite major concerns, still low literature on this topic
- ▶ Paper aims to analyse the impact of cyclones and heavy rainfall events on mortgage risk
- ▶ Case study in Florida
- ▶ Projection of future changes in risk

# Methodology

- ▶ Portfolio representative from the Florida Mortgage market
- ▶ Survival approach to predict probability of termination of mortgage (default and prepayment)
- ▶ Use of semi parametric for of additive Cox model, estimated by penalised ML approach to find the best fitting model
- ▶ Inference of the distribution of future hazards based on climate models

# Main results

- ▶ Default influenced by both tropical cyclones and rainfall, in a non-linear way
- ▶ Prepayment influenced only intense rainfalls for prepayment
- ▶ Climate change will unambiguously lead to an increase in risk of default, with heterogeneous effect on the tail of the distribution

# Strengths of the paper

- ▶ Very clear paper
- ▶ Major issue for the incoming decades
- ▶ Extensive and well-justified methodology

# Remaining questions

- ▶ Could you go into the details of the estimation method?
- ▶ **Consider prospective studies with other climate scenarios?**

# Paper Discussion n°2

## A “Silent Spring” for the Financial System? Exploring Biodiversity-Related Financial Risks in France (August 2021)

**Authors:** Romain Svartzman, Etienne Espagne, Julien Gauthey, Paul Hadji-Lazaro, Mathilde Salin, Thomas Allen, Joshua Berger, Julien Calas, Antoine Godin, Antoine Vallier

# Research question

- ▶ Newly emerging literature on the link between biodiversity loss and financial crisis risks
- ▶ Aims to quantitatively estimate the ecosystem services dependency of French financial institutions

# Methodology

- ▶ Assessment of the biodiversity dependence of securities issuers by sector, region and profit using several databases
- ▶ Databases includes production processes dependency of some ecosystem services (ENCORE database), and value of outputs produced by each sector in each region (EXIOBASE3)
- ▶ Assessment of the biodiversity services general dependence of the portfolio of financial institutions according to its securities

# Main results

- ▶ Provides a first assessment for securities Biodiversity-related Finance Risks in France
- ▶ Almost half (42%) of the portfolio of French financial institutions come from highly ecosystem services dependent issuers
- ▶ Quantitative estimation of equivalent in biodiversity loss as a land surface

# Strengths of the paper

- ▶ Large part of the paper devoted to the study of the topic of biodiversity for the economy
- ▶ Clear and very transparent approach for the reader
- ▶ Calls for many future research questions

# Remaining questions

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- ▶ Having studied scope 1 (direct impact), have you considered adding **a scope 2** (Energy)?
- ▶ You focus on regional impacts, how do you intend to account for **“delocalized impacts”**?
- ▶ Did you consider **heterogeneity among the securities holder** you studied?

Thank you for your attention Questions?