

How vulnerable is Europe to severe climaterelated disasters abroad?

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Context





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Introduction



Well covered

- Domestic/Regional impact of disasters
- Economic impact via trade

Less covered

- Cross-border impacts
- Financial sector
- Europe







1. Couple Natural Disaster Models to CGE Models (GDyn-FS)



Model set-up





RECEIPT has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant agreement No. 820712

Receipt

Extreme weather events considered



Past disasters	CLIMADA future projection
Hurricanes Harvey, Irma and Maria, United States 2017	2050
Typhoon Lekima, China, August 2019	2053
Typhoons Trami and Hagibis, Japan, September-October 2018 and October 2019	2053

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Scenario assumptions

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Paris goals for climate change are met	Paris goals for climate change are not met
Socio-economic scenario: SSP1 (Sustainability: "Taking the Green Road")	Socio-economic scenario: SSP 2 ("Middle of the road")
Frequency and intensity of Tropical Cyclones and Hurricanes remain stable*	Frequency and intensity of Tropical Cyclones and Hurricanes increase in the future +10%
Exposure increases in proportion to economic growth	Exposure increases in proportion to economic growth

Gross World Product (2014 USD)



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* Hurricanes are tropical storms that form over the North Atlantic Ocean and Northeast Pacific. Tropical Cyclones are formed over the South Pacific and Indian Ocean.

Extreme weather events considered





Assumed impact on European finance and the economy through changes in the flows of international trade and investment:

- European foreign investors and banks lose equity due to destroyed or damaged property and commercial disruption
- + New opportunities for (recovery) investment.



Innovations

1. Couple Natural Disaster Models to CGE Models (GDyn-FS)

2. Assess impact on financial markets

Direct losses (€)

- International capital-finance mobility ۲
- Composite financial asset •

3. Combine remote & compound extreme weather events





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1. Investment & Capital stock in affected countrie

Results

Ambitious Paris = SSP1, intensity 0 Failed Paris = SSP2, intensity 10

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Results

2. Sectoral impact in EU

Ambitious Paris = SSP1, intensity 0 Failed Paris = SSP2, intensity 10 Combined occurrence of events





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Results





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4. Geographical origin

Individual (country) analysis of identical shocks on EU GDP





Observations & Conclusions



- Short run ↔ long run impact
- Higher frequency and intensity (Paris not met) → Increases magnitude positive/negative impact.
- Finance:
 - Short run: higher valuation due to scarcity
 - Long run: money drain towards reconstruction → negative impact EU economy in subsequent years.

EU foreign investor lose wealth and this loss is not rapidly recovered, especially if Paris goals are not met.



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