Climate Risk Effects in International Finance

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Two-way connection

Climate risks for financial system

- Regulatory risks
- Credit risks
- Collateral risks
- Asset value risks

Financial system can contribute to climate solutions

- Help markets price climate risks
- Move money from exposed to green industries and other climate solutions, e.g.
  - CO2 capture
  - Alternative energy
  - Alternative protein
  - Adaptation solutions

Three types of industries

- Exposed
- Neutral
- Green

1. Climate risks for finance

Physical risks

Physical risks

- Acute
- Chronic
  - Avg
  - Tails

- Actual risks to fin. firms’ physical capital
- Exposure through assets
  - Creditworthiness of borrowers
  - Collateral

- “Easy” to measure - e.g. fire/flood risks are available at detailed geo level
  - Cross with geolocation of firms/assets

Transition risks - financial institutions

- Voluntary “greening” of portfolios
- Regulatory “greening” incentives
  - Risk weights/capital surcharge for banks
  - Mandatory emission disclosures
- Complexities
  - Definitions, taxonomies, ratings
  - Regulatory arbitrage across countries
- Risks
  - On trading assets, repricing risks
  - On loans - collateral values

Three sources of transition risk

- Regulation
- Technologies
- Investor and Consumer Preferences

Transition risks - non-financial firms

- Creditworthiness, growth, stranded assets
- Collateral values affected through asset pricing
- Difficulty measuring these risks
  - Uncertainty about future changes / timing
  - Vertically integrated businesses + fungibility of money
  - Lack of mandatory reporting of emissions
- Regulators: best practices for industry/activity-level risk measures
  - Mandatory reporting will never cover small firms
  - Scope 3 emissions are crucial to avoid risk-shifting across jurisdictions

Three sources of transition risk

- Regulation
- Technologies
- Investor and Consumer Preferences

Pet Peeve #1

Scope 3

<u>Examples:</u>

- Multinationals and their input purchases (in- vs. out-sourcing)
- Car manufacturers
- Financial institutions

Pet Peeve #2

Transition risks assessment and ESG ratings

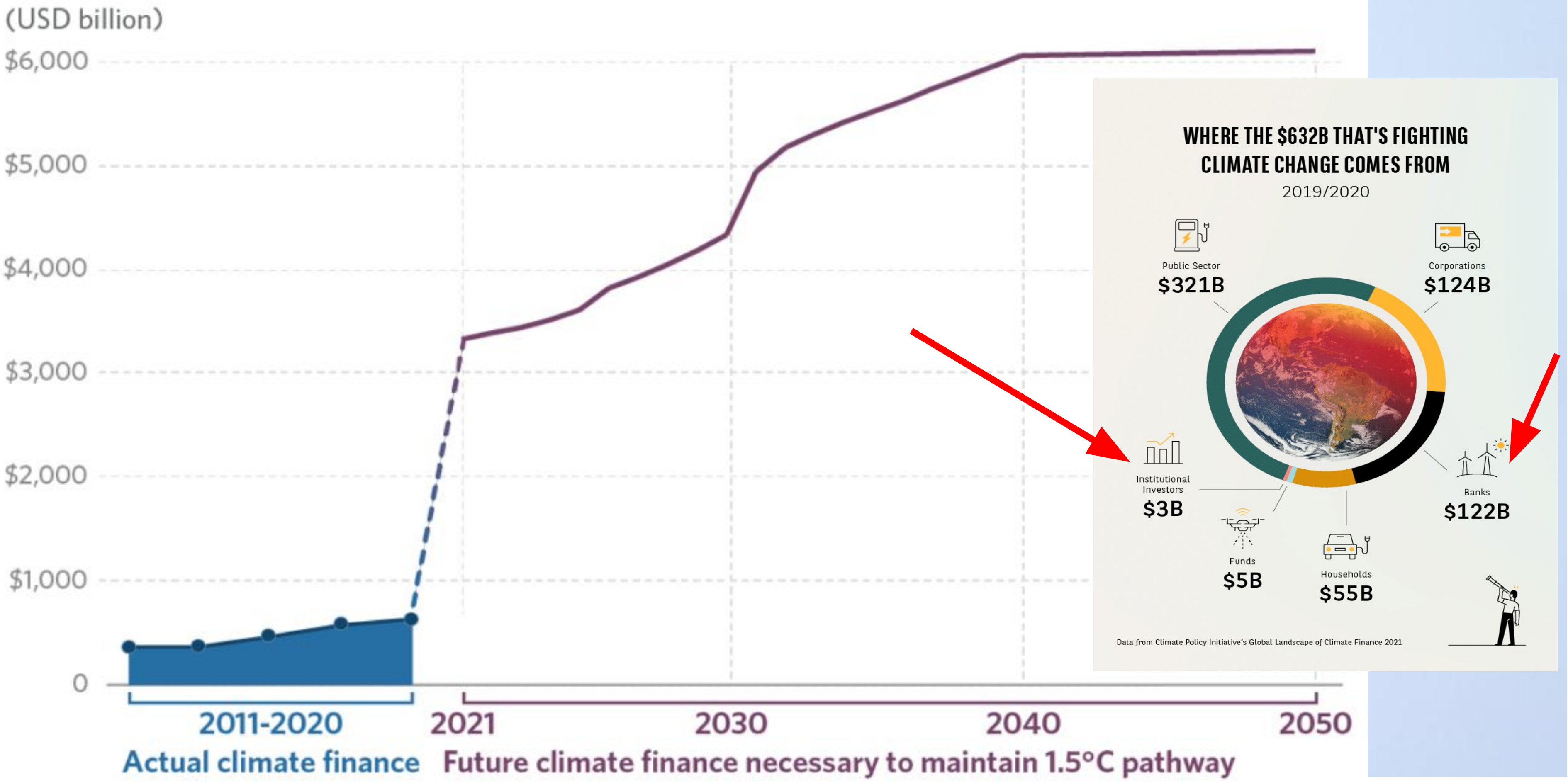
Common practice is to assess risks *within industries*

- OK for some empirical work
- Not OK for risk assessment

2. Financial markets and climate change

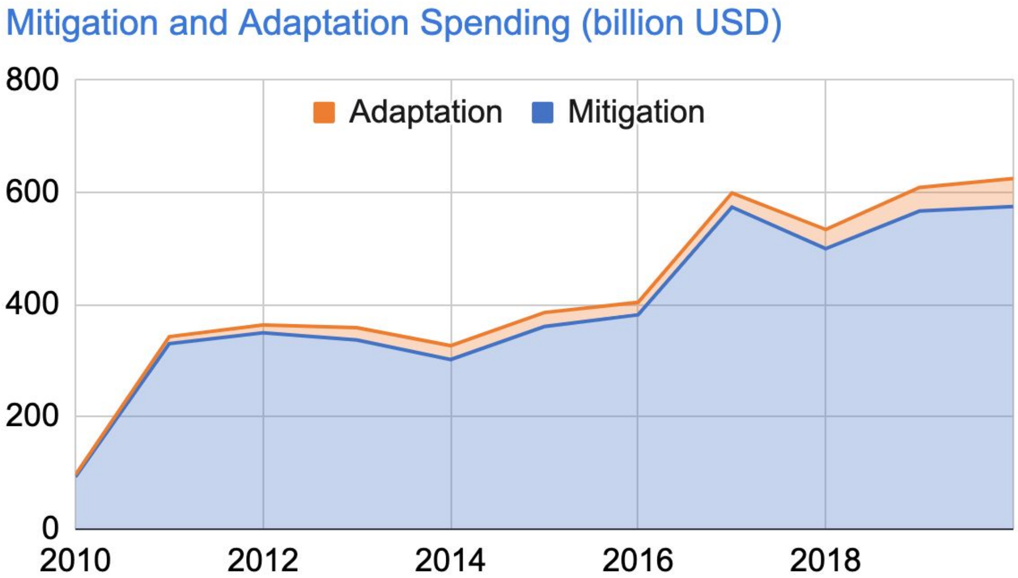
Private sector financing is needed for climate solutions

Figure 3: Global tracked climate finance flows and the average estimated annual climate investment need through 2050



What solutions?

- Mitigation
- Adaptation
    - Man-made
    - Nature-based



Properly pricing risks can redirect funds from exposed to green/greening industries

Investing in climate solutions is a hedge for climate risks

Challenges in attracting financial sector

- Temporal profile of payoffs
- Payoffs not easily financialized
- Payoffs are distributed across stakeholders
- Risks (enforcement, measurement)
- Scale

Overcoming

Challenges in attracting financial sector

Structured finance

NGO participation

Government support

Fintech/tokenization

Other fin. innovation

- Temporal profile of payoffs
- Payoffs not easily financialized
- Payoffs are distributed across stakeholders
- Risks (enforcement, measurement)
- Scale

Co-benefits

Climate solutions marketplace

Sorting needed

Attractive investment profile	Needs de-risking, ROI boost, or both	No hope for private investment
Traditional or impact investment	G insurance	G or NGO funding
Green investment	G or NGO grant	
Regulation helps, but not need for direct G or NGO involvement	Can help attract private investors Tokenization	

Pet Peeve #3

Non-emitting = Neutral

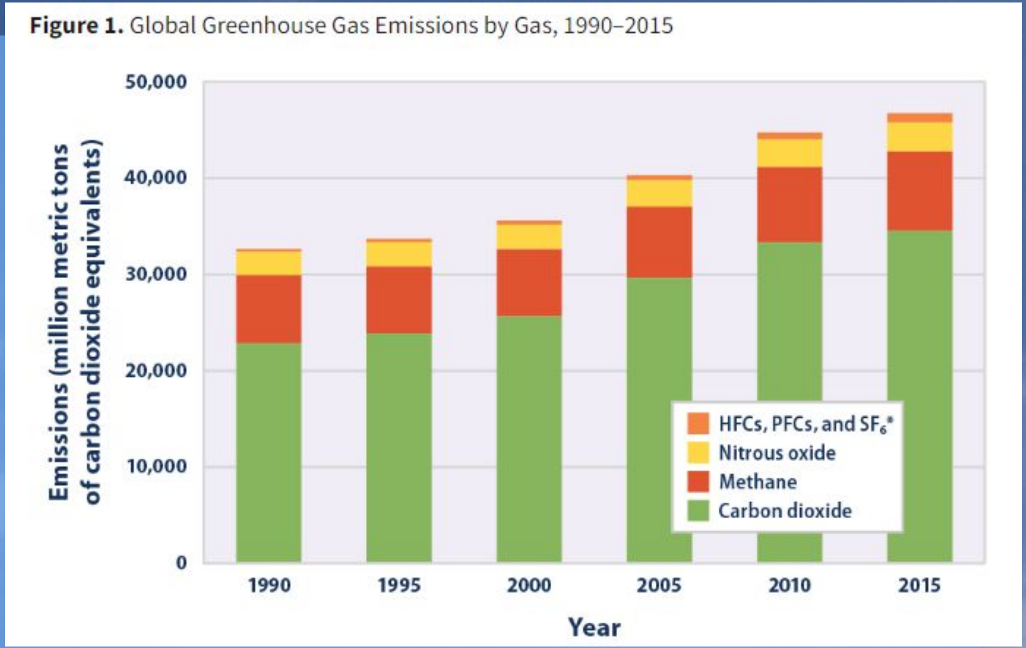
Non-emitting =/= Green

However, emitting could be *greening*

Pet Peeve #4

Other GHGs

Everyone is focusing on CO_2.



Other GHGs are important - can't reach Paris goals unless reduce them. Methane - shorter half-life, more immediate effect.

Main source: animal agriculture.

Conclusion:

Climate change poses substantial stability risks to the international financial system, given risks do not appear to be priced in

Financial sector has an opportunity to contribute to climate solutions, by investing in alternative energy, carbon capture technology, emission measurement technology, alternative proteins, and climate adaptation solutions (including NBS)