Finance and climate change: What role for central banks and financial regulators?

Emanuele Campiglio[1] Yannis Dafermos[2] Pierre Monnin[3]
Josh Ryan-Collins[4] Guido Schotten[5] Misa Tanaka[6]

[1]Vienna University of Economics and Business [2]University of the West of England
[3]Council on Economic Policies [4]University College London
[5]De Nederlandsche Bank [6]Bank of England

Workshop on Central Banking and Green Finance
28 November, 2017 - Amsterdam

Outline of the talk

- The rationale
  - Why should central banks care about climate change in the first place?
  - Climate-induced damages and transition financial risks

Outline of the talk

- The rationale
  - Why should central banks care about climate change in the first place?
  - Climate-induced damages and transition financial risks
- Two main potential contributions:

Outline of the talk

- The rationale
  - Why should central banks care about climate change in the first place?
  - Climate-induced damages and transition financial risks
- Two main potential contributions:

1. Research:
   - Empirical assessment of exposure to climate-related risks
   - Assessment of wider socioeconomic implications

Outline of the talk

- The rationale
  - Why should central banks care about climate change in the first place?
  - Climate-induced damages and transition financial risks
- Two main potential contributions:

1. Research:
   - Empirical assessment of exposure to climate-related risks
   - Assessment of wider socioeconomic implications
2. Policy:
   - Disclosure of climate-related risks by companies and investors
   - Align policy toolkit to climate-related objectives

Outline of the talk

- The rationale
  - Why should central banks care about climate change in the first place?
  - Climate-induced damages and transition financial risks
- Two main potential contributions:

1. Research:
   - Empirical assessment of exposure to climate-related risks
   - Assessment of wider socioeconomic implications
2. Policy:
   - Disclosure of climate-related risks by companies and investors
   - Align policy toolkit to climate-related objectives

- Conclusions
  - It's a matter of mandate: high-income vs emerging economies
  - Looking forward

Climate-related financial risks

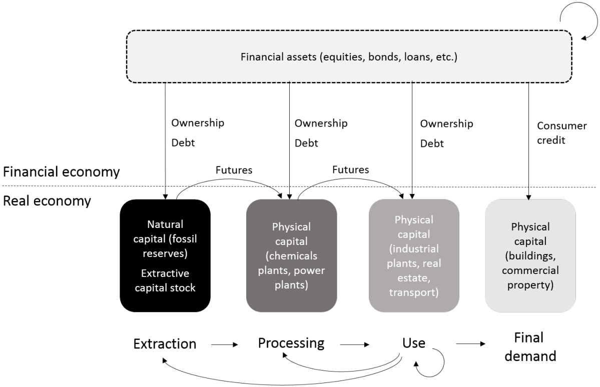
- Climate-induced disruptions
  - Economic losses, destruction of physical assets, financial instability
  - Transition to low-carbon society required

Climate-related financial risks

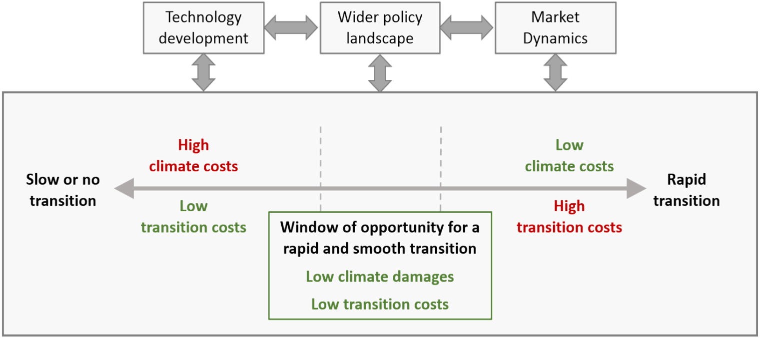
- Climate-induced disruptions
  - Economic losses, destruction of physical assets, financial instability
  - Transition to low-carbon society required
- Transition risks
  - Large-scale structural shift to new technologies and process
  - A network of assets at risk of stranding

Climate-related financial risks

- Climate-induced disruptions
  - Economic losses, destruction of physical assets, financial instability
  - Transition to low-carbon society required
- Transition risks
  - Large-scale structural shift to new technologies and process
  - A network of assets at risk of stranding

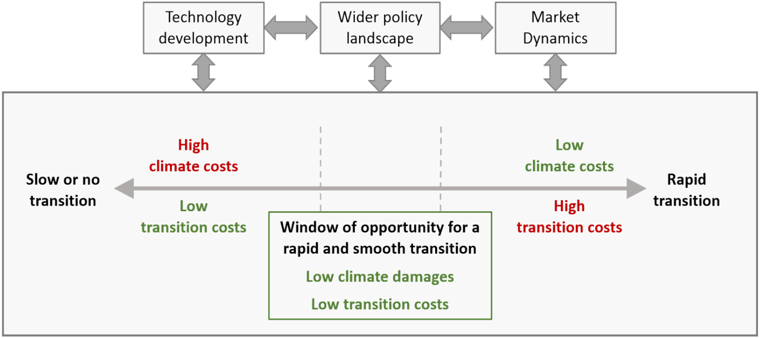


The quest for a rapid and smooth transition



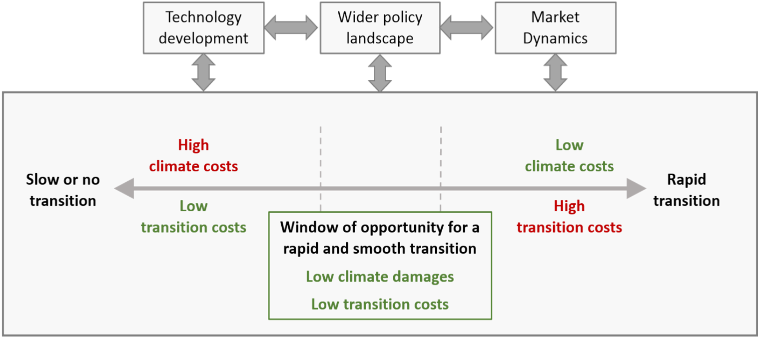
- A smooth transition won't happen by itself $\rightarrow$ Policies needed

The quest for a rapid and smooth transition



- A smooth transition won't happen by itself $\rightarrow$ Policies needed
- Carbon pricing may not be enough, or even exacerbate transition risks

The quest for a rapid and smooth transition



- A smooth transition won't happen by itself $\rightarrow$ Policies needed
- Carbon pricing may not be enough, or even exacerbate transition risks

Is there any role for central banks and financial regulators?

1. Research

1. Research

- First objective: assess the relevance of the issue
  - How exposed is the financial system to climate-related risks?
  - What could be the wider socioeconomic implications of these risks?

1. Research

- First objective: assess the relevance of the issue
  - How exposed is the financial system to climate-related risks?
  - What could be the wider socioeconomic implications of these risks?

1. Develop methodologies to measure climate-related risks
   - Central banks (DNB, BoE); academic research (Battiston et al. 2017); think-tanks (2dii)
   - Rating agencies mainly focusing on ESG risks
   - Issues: deep uncertainty; lack of empirical data; developing methods

1. Research

- First objective: assess the relevance of the issue
  - How exposed is the financial system to climate-related risks?
  - What could be the wider socioeconomic implications of these risks?

1. Develop methodologies to measure climate-related risks
   - Central banks (DNB, BoE); academic research (Battiston et al. 2017); think-tanks (2dii)
   - Rating agencies mainly focusing on ESG risks
   - Issues: deep uncertainty; lack of empirical data; developing methods
2. Develop modelling tools to study socioeconomic impacts
   - What impacts on growth, employment, distribution?
   - Current modelling (DSGE, IAMs) unable to grasp transition complexity
   - Alternatives: Stock-Flow Consistent models and Agent-based Modelling (Burgess et al. 2016; Turrell et al. 2016)

2. Policy

- If risks found to be relevant, regulators could act on it

2. Policy

- If risks found to be relevant, regulators could act on it
- Two areas of potential intervention:
  1. Nudge/impose disclosure of climate risks by private agents
  2. Align policy toolkit to climate objectives

2. Policy

- If risks found to be relevant, regulators could act on it
- Two areas of potential intervention:
  1. Nudge/impose disclosure of climate risks by private agents
  2. Align policy toolkit to climate objectives
- Combination of two objectives:
  - Mitigate transition financial risks
  - Facilitate low-carbon financing

2. Policy

- If risks found to be relevant, regulators could act on it
- Two areas of potential intervention:
  1. Nudge/impose disclosure of climate risks by private agents
  2. Align policy toolkit to climate objectives
- Combination of two objectives:
  - Mitigate transition financial risks
  - Facilitate low-carbon financing

	Concept	Current applications
Assessment of climate-related risks	Develop and apply methodologies to identify and measure climate-related risks	De Nederlandsche Bank[8,29] Bank of England[32]
Disclosure of climate-related risks	Develop standardised methods of climate-related risk reporting	Task Force on Climate-related Financial Disclosures[33] French Energy Transition Law[65]
Climate-aligned prudential regulation policy	Use prudential regulation tools (e.g. reserve and capital requirements) to incentivise lending to low-carbon activities and/or discourage lending to high-carbon activities	Banque du Liban[39] Banco Central do Brasil[40]
Green central bank financing	Provide additional/subsidised liquidity to banks lending to low-carbon activities	Bangladesh Bank[59]
Lending quotas	Impose a minimum proportion of bank lending to flow to low-carbon sectors	Reserve Bank of India[60] Bangladesh Bank[59]
ESG factors in asset eligibility criteria	Include ESG criteria in the evaluation of the overall risk of an asset purchased or accepted as collateral	Only for own purchase, e.g. De Nederlandsche Bank[47], Norges Bank[48]
Green Quantitative Easing	Purchase 'green' assets as part of Quantitative Easing programmes	Only indirectly through development banks' assets, e.g. European Investment Bank bonds[51]

Disclosure of climate-related risks

Disclosure of climate-related risks

- Develop standardised methods of climate-related risk reporting
  - Task Force for Climate-Related Financial Disclosures
  - French Energy Transition Law (Art. 173)
  - Industry-led initiatives

Disclosure of climate-related risks

- Develop standardised methods of climate-related risk reporting
  - Task Force for Climate-Related Financial Disclosures
  - French Energy Transition Law (Art. 173)
  - Industry-led initiatives
- Availability of good data essential and fits with the neutrality narrative

Disclosure of climate-related risks

- Develop standardised methods of climate-related risk reporting
  - Task Force for Climate-Related Financial Disclosures
  - French Energy Transition Law (Art. 173)
  - Industry-led initiatives
- Availability of good data essential and fits with the neutrality narrative
- However:
  - Enough to achieve smooth transition?

Disclosure of climate-related risks

- Develop standardised methods of climate-related risk reporting
  - Task Force for Climate-Related Financial Disclosures
  - French Energy Transition Law (Art. 173)
  - Industry-led initiatives
- Availability of good data essential and fits with the neutrality narrative
- However:
  - Enough to achieve smooth transition?
  - If systemic risks found; what then?
    - Financial markets may not fully internalise risks into asset prices

Disclosure of climate-related risks

- Develop standardised methods of climate-related risk reporting
  - Task Force for Climate-Related Financial Disclosures
  - French Energy Transition Law (Art. 173)
  - Industry-led initiatives
- Availability of good data essential and fits with the neutrality narrative
- However:
  - Enough to achieve smooth transition?
  - If systemic risks found; what then?
    - Financial markets may not fully internalise risks into asset prices
  - Central banks not setting example to follow

2. Climate-aligned financial regulation

2. Climate-aligned financial regulation

- Macro- and micro-prudential regulation
  - Reserve, liquidity, and capital requirements; loan-to-value ratios; ceilings on credit growth; others
  - Several central banks now in charge of financial regulation
  - Negative impact on sustainable investment?

2. Climate-aligned financial regulation

- Macro- and micro-prudential regulation
  - Reserve, liquidity, and capital requirements; loan-to-value ratios; ceilings on credit growth; others
  - Several central banks now in charge of financial regulation
  - Negative impact on sustainable investment?
- Climate-aligned prudential regulation
  1. Differentiate prudential tools depending on lending destinations

2. Climate-aligned financial regulation

- Macro- and micro-prudential regulation
  - Reserve, liquidity, and capital requirements; loan-to-value ratios; ceilings on credit growth; others
  - Several central banks now in charge of financial regulation
  - Negative impact on sustainable investment?
- Climate-aligned prudential regulation
  1. Differentiate prudential tools depending on lending destinations
  2. Include climate-related risks in risk-weighted prudential tools

2. Climate-aligned financial regulation

- Macro- and micro-prudential regulation
  - Reserve, liquidity, and capital requirements; loan-to-value ratios; ceilings on credit growth; others
  - Several central banks now in charge of financial regulation
  - Negative impact on sustainable investment?
- Climate-aligned prudential regulation
  1. Differentiate prudential tools depending on lending destinations
  2. Include climate-related risks in risk-weighted prudential tools
- Some applications in emerging economies
  - Banque du Liban: differentiated reserve requirements
  - Banco Central do Brazil: banks to incorporate ESG criteria in capital requirements

2. Climate-aligned financial regulation

- Macro- and micro-prudential regulation
  - Reserve, liquidity, and capital requirements; loan-to-value ratios; ceilings on credit growth; others
  - Several central banks now in charge of financial regulation
  - Negative impact on sustainable investment?
- Climate-aligned prudential regulation
  1. Differentiate prudential tools depending on lending destinations
  2. Include climate-related risks in risk-weighted prudential tools
- Some applications in emerging economies
  - Banque du Liban: differentiated reserve requirements
  - Banco Central do Brazil: banks to incorporate ESG criteria in capital requirements
- Some political traction in high-income regions
  - EU High-Level Expert Group on Sustainable Finance
  - European Supervisory Agencies to include ESG criteria
  - Central banks questioned (recent Draghi/Carney responses)

2. Climate-aligned financial regulation

2. Climate-aligned financial regulation

- Potential contrast with prudential objectives
  - Avoid a 'green bubble'
  - Calibrate the wedge between high-carbon/low-carbon requirements

2. Climate-aligned financial regulation

- Potential contrast with prudential objectives
  - Avoid a 'green bubble'
  - Calibrate the wedge between high-carbon/low-carbon requirements
- Needs to be implemented at investment level
  - Incentives to fossil-based companies willing to shift

2. Climate-aligned financial regulation

- Potential contrast with prudential objectives
  - Avoid a 'green bubble'
  - Calibrate the wedge between high-carbon/low-carbon requirements
- Needs to be implemented at investment level
  - Incentives to fossil-based companies willing to shift
- Would prudential regulation really act as a constraint?
  - Reserve requirements don't in high-income economies
  - Capital requirements?

2. Climate-aligned financial regulation

- Potential contrast with prudential objectives
  - Avoid a 'green bubble'
  - Calibrate the wedge between high-carbon/low-carbon requirements
- Needs to be implemented at investment level
  - Incentives to fossil-based companies willing to shift
- Would prudential regulation really act as a constraint?
  - Reserve requirements don't in high-income economies
  - Capital requirements?
- But: would fit with the financial instability argument
  - If climate financial risks relevant, this would justify intervention
  - Need to be able to measure risks

3. Climate-aligned central bank policies

3. Climate-aligned central bank policies

- Align central bank policies to climate-related goals
  - Focus shifted more to financing objective
  - Monetary policy (QE), collateral framework, liquidity, credit

3. Climate-aligned central bank policies

- Align central bank policies to climate-related goals
  - Focus shifted more to financing objective
  - Monetary policy (QE), collateral framework, liquidity, credit
- Two shades of 'Green QE':

3. Climate-aligned central bank policies

- Align central bank policies to climate-related goals
  - Focus shifted more to financing objective
  - Monetary policy (QE), collateral framework, liquidity, credit
- Two shades of 'Green QE':

1. CBs to purchase low-carbon financial assets
   - Mandate limits, overburden, risks to price/financial stability
   - But: indirect green QE possible through development banks
     - E.g. 10% ECB purchases in supranational entities

3. Climate-aligned central bank policies

- Align central bank policies to climate-related goals
  - Focus shifted more to financing objective
  - Monetary policy (QE), collateral framework, liquidity, credit
- Two shades of 'Green QE':

1. CBs to purchase low-carbon financial assets
   - Mandate limits, overburden, risks to price/financial stability
   - But: indirect green QE possible through development banks
     - E.g. 10% ECB purchases in supranational entities
2. Incorporate climate-related risks in asset eligibility criteria
   - Fits with disclosure and assessment narrative
   - Some central banks already apply selective criteria (not in QE)
     - Swiss National Bank, De Nederlandsche Bank, Norges Bank

3. Climate-aligned central bank policies

- Align central bank policies to climate-related goals
  - Focus shifted more to financing objective
  - Monetary policy (QE), collateral framework, liquidity, credit
- Two shades of 'Green QE':

1. CBs to purchase low-carbon financial assets
   - Mandate limits, overburden, risks to price/financial stability
   - But: indirect green QE possible through development banks
     - E.g. 10% ECB purchases in supranational entities
2. Incorporate climate-related risks in asset eligibility criteria
   - Fits with disclosure and assessment narrative
   - Some central banks already apply selective criteria (not in QE)
     - Swiss National Bank, De Nederlandsche Bank, Norges Bank

- Collateral framework: eligibility criteria affect asset desirability

3. Climate-aligned central bank policies

- Emerging economies proactive in pushing low-carbon financing
  - Financing schemes
  - Minimum credit quotas

3. Climate-aligned central bank policies

- Emerging economies proactive in pushing low-carbon financing
  - Financing schemes
  - Minimum credit quotas
- Bank of Japan's Loan Support Program
  - 'Lending priority sectors', including 'environment and energy businesses'

3. Climate-aligned central bank policies

- Emerging economies proactive in pushing low-carbon financing
  - Financing schemes
  - Minimum credit quotas
- Bank of Japan's Loan Support Program
  - 'Lending priority sectors', including 'environment and energy businesses'
- Reserve Bank of India
  - Credit quotas to 'priority sectors' (include renewable energy)

3. Climate-aligned central bank policies

- Emerging economies proactive in pushing low-carbon financing
  - Financing schemes
  - Minimum credit quotas
- Bank of Japan's Loan Support Program
  - 'Lending priority sectors', including 'environment and energy businesses'
- Reserve Bank of India
  - Credit quotas to 'priority sectors' (include renewable energy)
- Bangladesh Bank
  - Preferential refinancing lines to commercial banks for their green loans
  - Minimum 5% lending quota to green sectors

Some conclusions

Some conclusions

- Form and strength of interventions will depend on:
  - Mandate of the central bank
  - Interpretation given to the mandate
  - Willingness of central banks to push its boundaries

Some conclusions

- Form and strength of interventions will depend on:
  - Mandate of the central bank
  - Interpretation given to the mandate
  - Willingness of central banks to push its boundaries
- High-income economies
  - Neutrality; limited mandates and policy tools
  - Internalise risk and limit transition disruptions
  - Disclosure, risk assessment, stress testing

Some conclusions

- Form and strength of interventions will depend on:
  - Mandate of the central bank
  - Interpretation given to the mandate
  - Willingness of central banks to push its boundaries
- High-income economies
  - Neutrality; limited mandates and policy tools
  - Internalise risk and limit transition disruptions
  - Disclosure, risk assessment, stress testing
- Emerging economies:
  - Alignment to development goals; broader mandates and tools
  - Facilitate financing low-carbon activities
  - Climate aligned financial regulation, monetary policy, credit policy

Some conclusions

Some conclusions

- In high-income economies: no way around neutrality
  - No winner-picking, except when seriously needed
  - Climate crisis precondition for intervention?

Some conclusions

- In high-income economies: no way around neutrality
  - No winner-picking, except when seriously needed
  - Climate crisis precondition for intervention?
- Risk assessment is neutral
  - Develop methodologies of climate-related risk assessment
    - Exposure and socioeconomic implications
  - If risks found, include them in normal central banking operations
    - Prudential requirements, collateral framework, asset purchases

Some conclusions

- In high-income economies: no way around neutrality
  - No winner-picking, except when seriously needed
  - Climate crisis precondition for intervention?
- Risk assessment is neutral
  - Develop methodologies of climate-related risk assessment
    - Exposure and socioeconomic implications
  - If risks found, include them in normal central banking operations
    - Prudential requirements, collateral framework, asset purchases
- At the moment: no comprehensive climate risk assessment methodology
  - Rating agencies: timid advances on ESG risk; climate risks are different
  - Is it possible to create reliable assessment? Data availability issue
  - Lack of macroeconomic modelling up to the task

Some conclusions

- In high-income economies: no way around neutrality
  - No winner-picking, except when seriously needed
  - Climate crisis precondition for intervention?
- Risk assessment is neutral
  - Develop methodologies of climate-related risk assessment
    - Exposure and socioeconomic implications
  - If risks found, include them in normal central banking operations
    - Prudential requirements, collateral framework, asset purchases
- At the moment: no comprehensive climate risk assessment methodology
  - Rating agencies: timid advances on ESG risk; climate risks are different
  - Is it possible to create reliable assessment? Data availability issue
  - Lack of macroeconomic modelling up to the task
- Could this be the main role of central banks?

Thank you!

Emanuele.Campiglio@wu.ac.at

WIRTSCHAFTS UNIVERSITÄT WIEN VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS