Central Banking

Week 10: Climate Change and Central Banking

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Introduction

- Climate change increasingly affects macroeconomic stability and financial markets.

- Central banks are integrating climate-related risks into their mandates and policy frameworks.

- Key questions today:

  - Should central banks intervene?
  - How do climate risks affect monetary and financial stability?
  - What tools can central banks use?

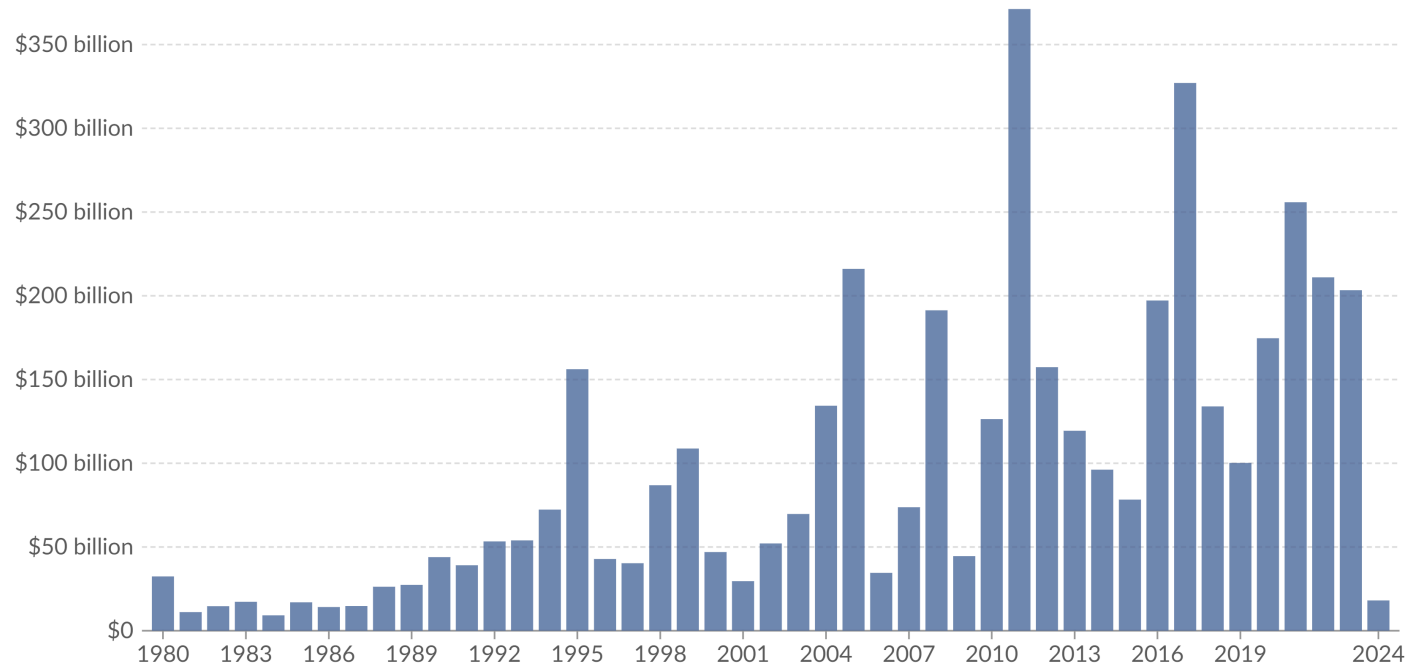# 1. Climate Change and Central Banking

Climate Change: It's Getting Warmer
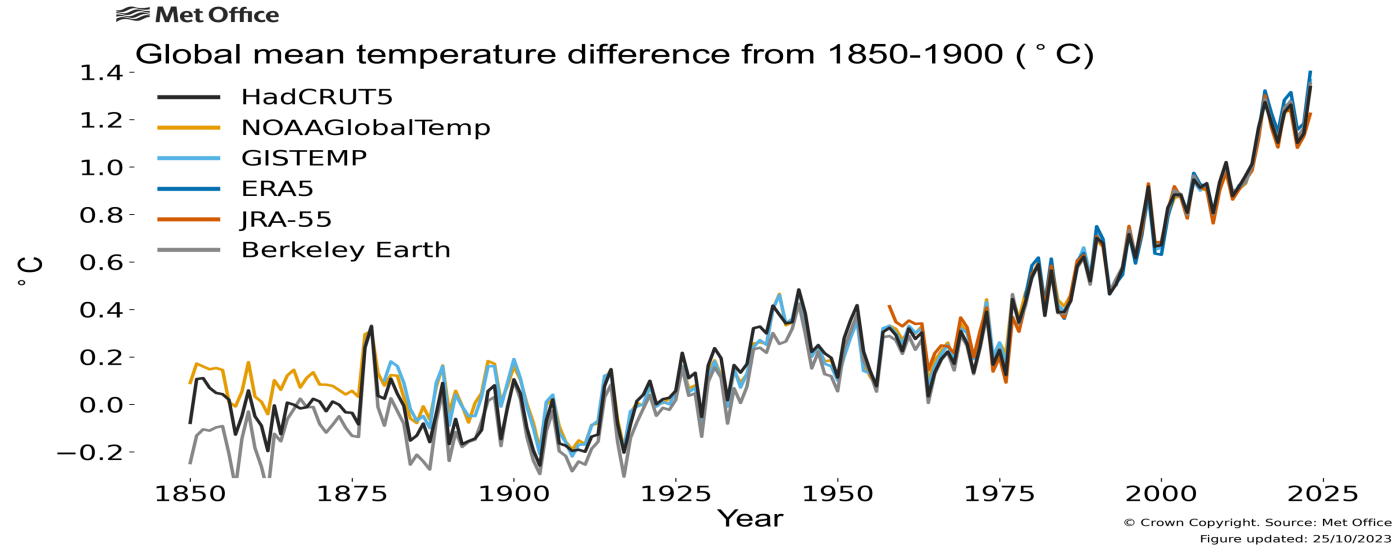
(Source: Met Office Climate Dashboard)

- Global temperature anomalies are rising.
- Climate change is no longer a distant risk — it's a present reality.

The Cost of Climate Disasters

(Source: Our World in Data based on EM-DAT)

- Disasters impose significant and rising economic costs relative to GDP.
- Wildfires, floods, and storms cause both direct and indirect damage.

Financial System's Contribution

(Source: Banking on Climate Chaos Report 2023)

- Banks continue to finance fossil fuels.
- $5.5 trillion invested since the Paris Agreement.

Why Should Central Banks Care?

- Price stability: Climate shocks disrupt supply chains → inflation.

- Financial stability: Asset devaluation, stranded assets.

- Sustainable economic growth: Transition risks affect employment and investment.

  Climate change directly impacts **core mandates**.

Channels of Climate Risk Transmission
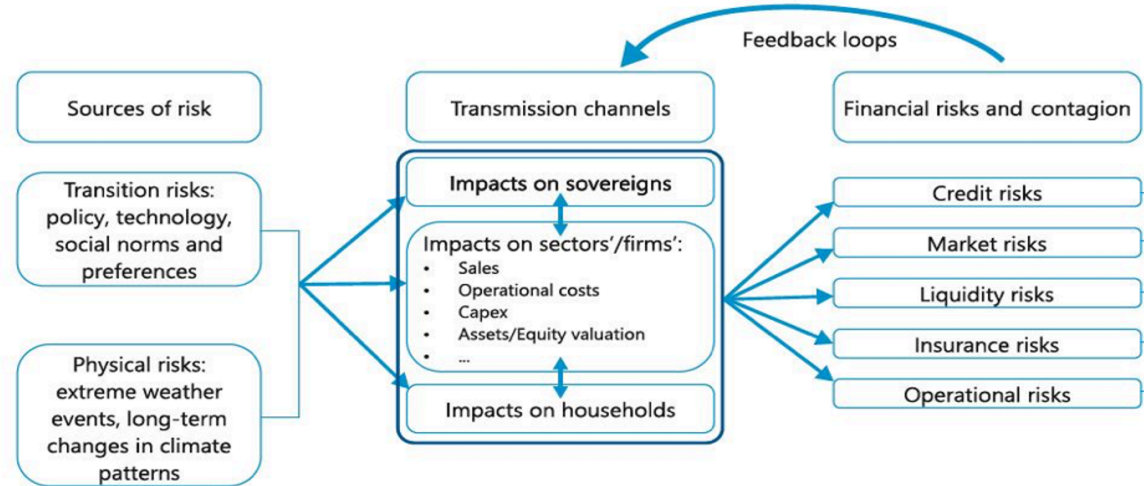
(Source: BIS Green Swan Report, 2020)

- Physical risks: Damages from weather events.
- Transition risks: Regulatory and technological shifts.
- Liability risks: Legal actions against firms.

Climate and Financial Stability

- Physical risk events → Bank losses → Credit crunch.

- Transition risk mispricing → Asset bubbles or sudden collapses.

- Systemic risks amplify macroeconomic shocks.

Mandates Across Countries

- 70/135 central banks have some sustainability-related mandate.

- Only 16 (12%) have explicit green mandates.

- Developing countries: Broader mandates including development goals.

(Source: Dikau & Volz, 2021)

CB Instruments for Climate Action

Monetary Policy

- Green collateral frameworks.
- Preferential interest rates.

Supervision

- Climate stress testing.
- Disclosure requirements.

Market Development

- Promote green bonds.

Communication

- Raising awareness and signaling priorities.

CB Instruments for Climate Action (Cont'd)

Table 1. Central Bank's Policy Instruments

	Classification	Description	Related literature
1	Monetary policy, prudential regulation, and supervisory measures	• Green quantitative easing/asset purchase • Green collateral valuation • Microprudential regulation (e.g., individual banks stress testing, green capital and liquidity requirements) • Macroprudential policy (e.g. economy-wide/banking system climate stress testing, climate risk capital buffers) • Information disclosure and reporting requirements • Market discipline • Supervisory guidance	Bartsch et al. (2024); Bilotta and Botti (2022); Boneva et al. (2021); Campiglio et al. (2018); Cullen (2023); Dikau, Robins, Smoleńska, van't Klooster, and Volz (2024); Dikau and Volz (2019); Ferrari and Landi (2024); Fisher and Alexander (2019); Grippa et al. (2019); Grunewald (2023); Hansen (2022); Masciandaro and Russo (2022a); Nakov and Thomas (2023); NGFS (2021, 2021); ODI and Climate Transparency, 2021; Rajan and Park, 2023; Skinner, 2021; Spinac et al., 2022; Stephens and Sokol, 2023, 2023; Vestergaard, 2022; Volz, 2017; World Bank, 2021
2	Credit allocation policies	• Targeted refinancing lines • Credit quotas • Preferred lending for green sectors	Barmes and Dikau (2024); Dikau (2022); Dikau and Volz (2019); ODI and Climate Transparency, 2021; Skinner, 2021; Stephens and Sokol, 2023; van't Klooster and Monnet, 2023; Volz, 2017
3	Guidance and communication	• Incentives and guideline for green financial market • Communication with the public • Soft power and advocacy	Dikau and Volz (2019); NGFS (2021); Shirai (2023); Spinac et al. (2022); World Bank (2021)
4	Research, capacity-building, and cooperation	• Research • Green taxonomy • Capacity-building • Collaboration at local and international levels	NGFS (2020); Spinac et al. (2022)
5	Leading by example	• Green portfolios of foreign reserves • Information disclosure	Campiglio et al. (2018); Fisher and Alexander (2019); Grippa et al. (2019); Koumbarakis (2021); Masciandaro and Russo (2022a); Spinac et al. (2022); World Bank (2021); World Economic Forum (2021)

Source: Authors' compilation based on literature

Skepticism and Challenges

- Weak, indirect impact tools.

- Risk of politicizing central banking.

- Difficulty in measuring climate exposures.

- Long time horizons vs. short policy cycles.

Case Studies

ECB Case Study

- 2021: ECB included climate considerations in monetary policy strategy.
- 2022: Integrated climate risk in corporate bond purchases.
- Strengthened supervisory expectations for banks.

BoE Case Study

- Early mover among advanced economies.
- 2015: First climate-related supervisory guidance.
- 2021: Incorporated net-zero support in monetary policy remit.
- Green corporate bond purchase programs.

Fed Case Study

- More cautious approach.
- 2020: Recognized climate as financial stability risk.
- 2021: Created Supervision Climate Committee (SCC).
- Legal constraints limit direct action.

Table 2. Policy Instruments Adopted by Selected Central Banks

	Classification	Tools	Advanced markets				Emerging markets					
			ECB	Fed	BOE	BOJ	PBOC	RBI	BCB	BdM	SARB	CBE
1	Monetary policy, prudential regulation, and supervisory measures	Green quantitative easing/asset purchase	x		x	x						
		Green collateral valuation	x		~		x	~				
		Microprudential regulation	~		~	~	x		x	~	~	~
		Macroprudential regulation	x	x	x	x	x	~	x	~	~	x
		Information disclosure and reporting requirements	x	~	x	x	x	x	x	~	~	x
		Market discipline	x	~	x	x	x	x	x	~	~	x
		Supervisory guidance	x	x	x	x	x	x	x	~	~	x
2	Credit allocation policies	Targeted refinancing lines	~			x	x		~			x
		Credit quotas					x	x				
		Preferred lending for green sectors	~			x	x	~				x
3	Guidance and communication	Incentives and guideline for green financial market	x		x	x	x	x	x	x		x
		Communication with the public	x	x	x	x	x	x	x	x	x	x
		Soft power and advocacy	x	x	x	x	x	x	x	x	x	x
4	Research, capacity-building, and cooperation	Research	x	x	x	x	x	x	x	x	x	x
		Green taxonomy	x		~		x	x	~	~	x	
		Capacity-building	x	x	x	x	x	x	x	x	x	x
		Collaboration at local and international levels	x	x	x	x	x	x	x	x	x	x
5	Leading by example	Green portfolios of foreign reserves	x		x	x	x		x	x	x	
		Information disclosure	x		x	x		x	x		x	

Notes: "x" refers to actions adopted; "~" refers to study, consideration, or development stage; Non-marked cells refer to no use or consideration of such tool or no information released. ECB: European Central Bank; Fed: US Federal Reserve System; BOE: Bank of England; BOJ: Bank of Japan; PBOC: People's Bank of China; RBI: Reserve Bank of India (RBI); BCB: Banco Central do Brasil; BdM: Banco de México; SARB: South African Reserve Bank; CBE: Central Bank of Egypt
Source: Authors' compilation based on literature, central banks' websites, Green Central Banking (2024), and Livingstone et al. (2024).

Developed vs. Developing Economies

- Developed: Careful integration, narrow mandates.

- Developing: Broader tools, but limited technical capacity.

- Examples: Bangladesh Bank (green lending); Brazil (environmental risk-weighted regulation).

G20 Green Central Banking Scorecard

Rank ⇅	Country ⇅	Aggregate Score ⇅ (out of 130)	Grade ⇅ (A+ to F)	Research and Advocacy ⇅ (out of 10)	Monetary Policy ⇅ (out of 50)	Financial Policy ⇅ (out of 50)	Leading by Example ⇅ (out of 20)
1	France	96	B+	10	23	47	16
2=	Germany	91	B+	10	23	48	10
2=	Italy	91	B+	10	23	48	10
4	European Union	87	B	10	23	44	10
5	Brazil	71	B-	10	18	33	10
6	China	61	C+	5	22	31	3
7	United Kingdom	53	C	10	11	24	8
8	Japan	42	C-	6	16	16	10
9	Indonesia	38	D+	5	14	15	4
10	India	30	D+	5	5	13	7
11=	Australia	26	D	10	0	15	1
11=	South Africa	26	D	10	1	11	4
13	Canada	25	D	5	1	16	3
14	Russia	21	D	5	0	14	2
15	Mexico	17	D-	5	2	1	9

- Most economies score poorly.
- France is the top performer.
- Large gaps between rhetoric and action.

To-Do List for Central Banks

- Enhance climate risk assessment.

- Integrate climate considerations into collateral and reserves policies.

- Promote green finance markets.

- Strengthen supervisory practices.

- Collaborate globally.

Summary

- Climate change is macro-critical.

- Central banks are moving, but cautiously and unevenly.

- Coordination with fiscal authorities is crucial.

- Communication and transparency will determine credibility.

Discussion Points

1. Should price stability remain the absolute priority even under climate threats?

2. How can central banks maintain independence while tackling green finance issues?

3. What is the "optimal" pace for integrating climate risks into monetary policy?

2. In-class Group Activity

Any QUESTIONS?

Thank You!

Next Class

-(May 14) ML/AI and Big Data in Central Banking

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- Guest Speaker: Dr. Cory Baird
- The readings will be posted on the Cyber Campus website.
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