Creating new paradigms while breaking old ones: the global shift towards green central banking

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The Evolving Landscape of Central Banking

- **Early 20th Century Shifts:** Transition from the gold standard to fiat money systems, marking significant changes in monetary policy (Schwartz, 1987; Bordo and Kydland, 1995).
- **Central Bank Independence in the 1950s:** Emergence of central bank independence, focusing on long-term price stability and insulating policy decisions from political pressures (Cukierman et al., 1992; Berger et al., 2001).
- **Inflation Targeting in the 1990s:** Adoption of specific inflation ranges to stabilize prices and manage expectations (Mishkin and Posen, 1998; Walsh, 2009).
- **Post-2008 Global Financial Crisis:** Emphasis on financial stability, adoption of macroprudential policies, and unconventional monetary tools like quantitative easing (Borio, 2011, 2014; Del Negro et al., 2012; McKay et al., 2016).

Cumulated adoption of climate-related financial policies

Gradual integration of climate-related risks into policy frameworks, recognizing the impacts of climate-related extreme events and transition risks (Batten et al., 2016; Campiglio et al., 2018; D'Orazio and Popoyan, 2019; Schoenmaker, 2021; Boneva et al., 2022)

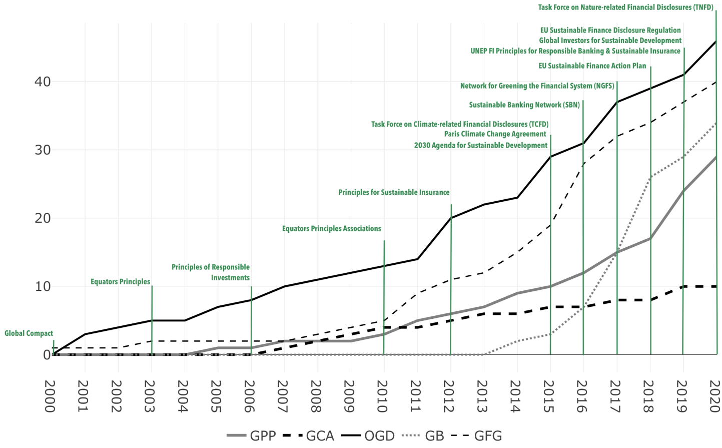


Figure: Source: *D'Orazio (2023)*

Global distribution of climate-related financial policies according to the CRFP Index

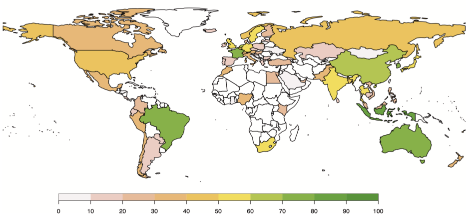


Figure: *Source: D'Orazio and Thole (2022). The CRFPI is a composite index that allows assessing, quantifying, and comparing international engagement in climate-related financial policymaking. The rationale behind it is that the higher the index, the higher the country's involvement in climate-related financial policymaking.*

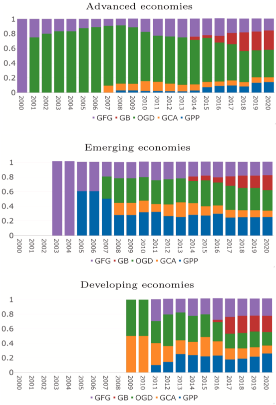


Figure: *The relative use of climate-related financial policies over time by income group. Notes. GPP: Green Prudential Policy; OGD: Other Green Disclosure Req.; GFG: Green Financial Guidelines; GB: Green Bonds; GCA: Green Capital Allocation. Source: D'Orazio and Thole (2022).*

Research question

Considering the gradual incorporation of climate risk considerations in central banks' policies since the early 2000s, can we delineate a paradigmatic shift in central banking?

Research Objectives

- To investigate the **transformation in the global financial system** driven by acknowledging climate-related risks;
- To examine the **empirical evidence of a paradigm shift** towards green central banking, considering integrating climate goals with traditional objectives and adopting new policy tools over the past 20 years.

Contribution to existing literature

- **Significance of paradigmatic shifts** towards green central banking, underscoring its role in an era of climate and environmental challenges.
- **Financial and monetary policy evolution** against climate and environmental challenges.

Research Methodology

- STEP 1: **Policy Analysis (2000-2022):** Examination of financial policies related to climate change implemented by central banks, financial supervisors, and regulators. Data sourced from D'Orazio (2023) for 2000-2020, with recent policies post-2020 added to the database.
- STEP 2: **Application of Peter Hall's Theory:** Categorizing identified policies according to Hall's framework to understand policy evolution. This results in a dataset with detailed country-level policy adoption data, labeling each policy by its *order of change*.
- STEP 3: **Paradigmatic shifts analysis:** Investigate the policy changes over time, emphasizing differences between advanced economies and EMDEs.

Climate-related financial policies by central banks, financial supervisors, and regulators

Financial Policy Area		Category		Objective	Instrument	Example
POLICY AREA I (GPP)	**Green Prudential Regulations**: to promote the development of green macroprudential frameworks	***Capital***	*Quality and level of capital*	Mitigate and prevent excessive credit growth and leverage	CAR with GSF/BPF CCyB Sectoral Leverage Ratios Sectoral Capital Requirements	
			Risk management and supervision	Evaluate effect of economic or financial shocks to the financial system	Climate-related stress test (macro)	**UK**, 2019, General Insurance Stress Tests (GIST) Cover Natural Catastrophe Scenarios and Climate Change Risks (Largest banks and insurers), Prudential Regulatory Authority
				Assess exposure of of banks' portfolios to carbon-intensive assets	Green Asset Ratio	
				Internal Process of Capital Adequacy Assessment: Include social and environmental risks when assessing their capital needs	ICAAP	**Brazil**, 2011, Circular No. 3,547/2011, Banco Central do Brazil
			Enhanced risk disclosure and market discipline	Inform about concentration of carbon-intensive assets in the financial sector	Climate-related disclosure requirements	**China**, 2013, China's Green Credit Statistics System, China Banking Regulatory Commission (CBRC)
		Liquidity	*Liquidity*	Mitigate and prevent market illiquidity and maturity mismatch	LCR NSFR	
		Large exposures	*Lending limits*	Mitigate systemic risk by limiting the concentration of certain exposures	Large exposures limit	
POLICY AREA II (GCA)	**Green Credit Allocation Policies:** to directly promote green credit measures and investments					**India**, 2015, Priority Sector Lending, Reserve Bank of India
POLICY AREA III (GFP)	**Green Financial Principles**: to create green financial markets					**Australia**, 2015, Environmental, Social, and Governance (ESG) Reporting Guide, Financial Services Council
POLICY AREA IV (OGD)	**Other disclosure requirements**: to promote the public disclosure of climate risks (also for non-financial institutions)					**France**, 2001, New economic regulations Act requires publicly traded companies to disclose environmental information, Government
POLICY AREA V (GB)	**Green bonds taxonomy and issuing**: to promote the development of green financial securties					**Indonesia**, 2017, Regulation on the Issuance and the Terms of Green Bond (No. 60/POJK.04/2017), Financial Services Authority of Indonesia (OJK)

Figure: Overview of the five policy areas considered in the analysis. Source: Author elaboration adapted from D'Orazio and Thole (2022).

Peter Hall's 1993 Theory of Policy Changes

Significance: Hall (1993) theory is crucial for differentiating between minor adjustments and major paradigmatic changes in policy, offering a structured framework to study policy evolution in political science and public policy.

- **First-Order Change:** Adjustments in the settings of policy instruments. It involves fine-tuning existing tools without altering the policy's overall goals or methods. *Example: Adjusting interest rates for monetary policy.*
- **Second-Order Change:** Changes in the techniques or policy instruments used, while the overarching goals remain the same. The means change, but the ends do not. *Example: Shifting from interest rate changes to quantitative easing for inflation control.*
- **Third-Order Change:** A comprehensive shift in the overarching goals, values, and techniques of policy. This represents a paradigm shift, altering the entire philosophy guiding policy decisions. *Example: Moving from Keynesian to neoliberal economic principles.*

Peter Hall's Theory in the Context of Central Banking

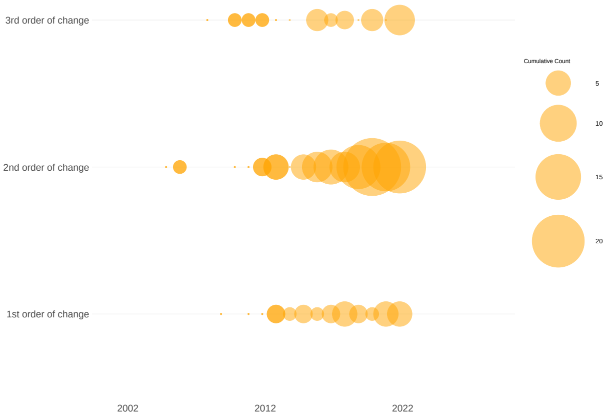
- Peter Hall's theory provides a **structured framework** for understanding policy changes in central banking, distinguishing between various levels of changes: minor adjustments, changes in policy instruments, and fundamental shifts in policy goals and objectives.
- The theory's emphasis on **institutional learning and adaptation** highlights how financial institutions learn from past experiences, economic research, and global financial trends, leading to *evolutionary policy shifts*.
- Hall's framework is valuable for **cross-country comparative analysis** in central banking, allowing for the study of diverse responses to similar challenges across countries.

Classification of financial policies according to Peter Hall's Theory

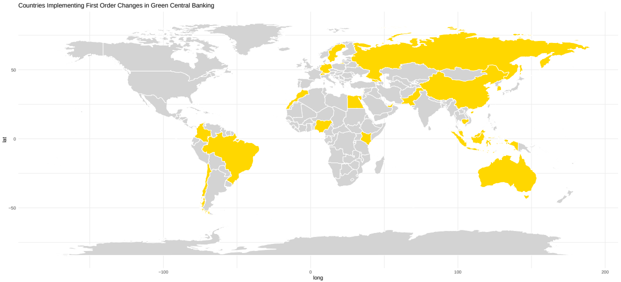
Policy Type	First-Order of Change	Second-Order of Change	Third-Order of Change
Climate-related Disclosure Requirements	Minor adjustments to existing rules	Introducing new forms of reporting	Redefining corporate responsibility and financial transparency
Examples	*Malaysia, 2014 Sustainable and Responsible Investment Sukuk Framework*	*Netherlands (2019) The Dutch Authority for the Financial Markets 2019 Agenda - Supervision in Transition*	NA
Climate-related Stress Testing	Adding climate factors to existing methodologies	Developing new models for climate risks	Redefining financial regulation to prioritize climate resilience
Examples	*Canada (2020) The Bank of Canada Conducted Climate-related Scenario Analysis*	*China (2021) Pilot Climate Risk Stress Test on the Hong Kong banking sector*	*China (2017) Securities Regulatory Commission - Green Bond Assessment Guidelines for Listed Companies*
Green Bonds	Adjusting existing tools	Introducing new tools within the same framework	Fundamental shift in goals and instruments
Examples	*Morocco (2018) Guidelines on green, social and sustainable bonds*	*China (2015) Notice (No. 39) on the Issue of Green Financial Bonds in China's Inter-Bank Bond Market*	*China (2017) Guiding Opinions of the China Securities Regulatory Commission on Supporting the Development of Green Bonds*

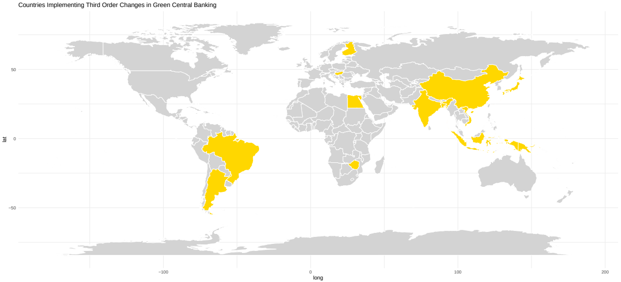
Policy Type	First-Order of Change	Second-Order of Change	Third-Order of Change
Green Credit Allocation	Modifying loan requirements within the current regulatory structure	Introducing new instruments like green lending facilities	Redefining primary mission to include environmental sustainability
Examples	*Singapore (2019) Singapore's Green Investments Programme*	*Fiji (2012) Agriculture and Renewable Energy Loans Ratio*	*Bangladesh (2019) Green Transformation Fund*
Green Financial Guidelines	Adjusting financial regulations to include environmental considerations	Establishing new standards for green investments	Redefining financial regulation to prioritize environmental sustainability
Examples	*Australia (2013) Prudential Practice Guide on Investment Governance (SPG 530)*	*Bangladesh (2011) Policy Guidelines on Green Banking*	*Argentina (2015) The Securities Commission (regulated under Law N° 26.831) adopts sustainability in its mandate*

Temporal evolution of orders of change



Focus: global diffusion of first and third orders of change





Orders of Change by Income Classification

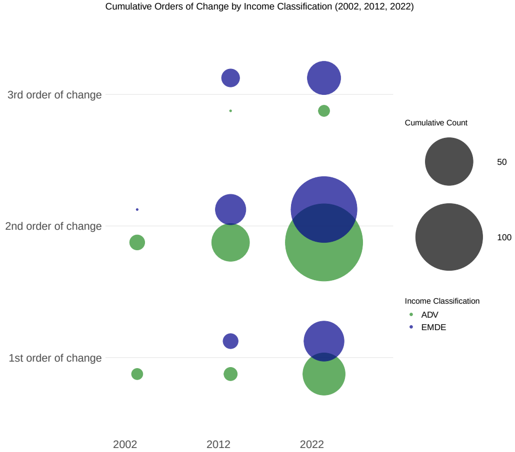


Figure: *Total number of policies by order of change and income classification. The total count of policies is categorized based on their order of change, with countries grouped according to the World Bank's income classification system.*

Main Findings

- **Main contribution**: The proposed analysis shows how financial policies are evolving in response to increasing climate risks, illustrating the financial system's capacity to adapt to challenges on a global scale.
- **Temporal and Content Dimensions:** The study reveals that policy development within central banking exhibits distinct temporal and content-based changes. This evolution is consistent with Hall (1993) theory of policy changes.
- **Shift from Second- to Third-Order Change (paradigmatic shift):** Over the past two decades, a temporal shift from second- to third-order change has been observed, driven by the ideational shift towards green central banking. *However, green central banking is still a contested and evolving concept.*

Concluding remarks

- **Third-Order Change in Central Banking:** The shift towards green central banking represents a third-order change as per Peter Hall's framework, characterized by novel macro or systemic policy objectives and new assumptions. This transition is intellectually radical and potentially transformative.
- **Swift and Dramatic Paradigmatic Shift:** This conceptual change has unfolded rapidly, characterized by radical ideas and a dramatic ascendance over a few years. It includes prior phases of policy experimentation, categorized as first and second order.
- **Gradual Transformation in Regulatory Practices:** Despite the radicalism of thought, transformative regulatory practices in green central banking will likely evolve gradually, involving cautious steps towards an active regulatory framework.
- **Influence of Opposing Factors:** The direct transition to radical regulatory practices is constrained by political considerations, institutional constraints, and limitations in information and data (main issues: legitimacy concerns, mission creep, inflationary pressures, reputational impact, distributional effects, credibility issues).
- **Progress Based on Empirical Evidence:** The shift towards green policies in central banking regulation will progress as more empirical evidence and data are gathered, necessitating efforts that are both time-intensive and involve building the necessary capacity.

Thank you for your attention!

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