

# Why and How Could Contingent Debt be Designed to Address the Inability to Set a Global Carbon Tax?

Uncertainty, Climate Change, and Policy Challenges Conference

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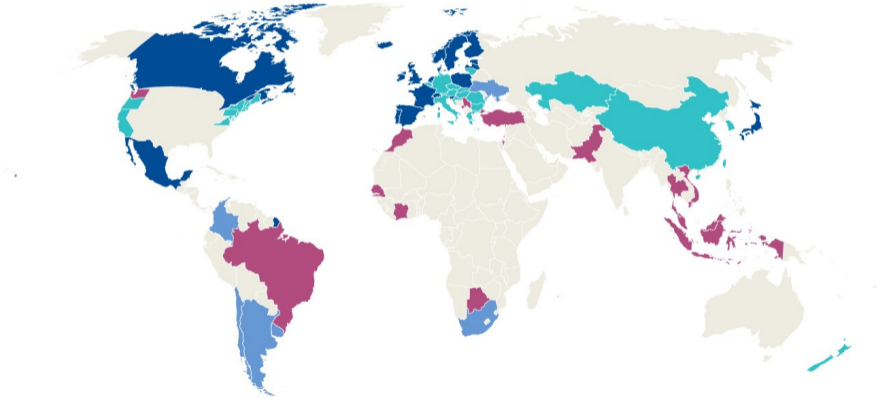
May 2-3, 2024

<sup>1</sup> Based on joint work with:

Barbalau and Zeni (2023) "Reducing Carbon using Regulatory and Financial Market Tools"

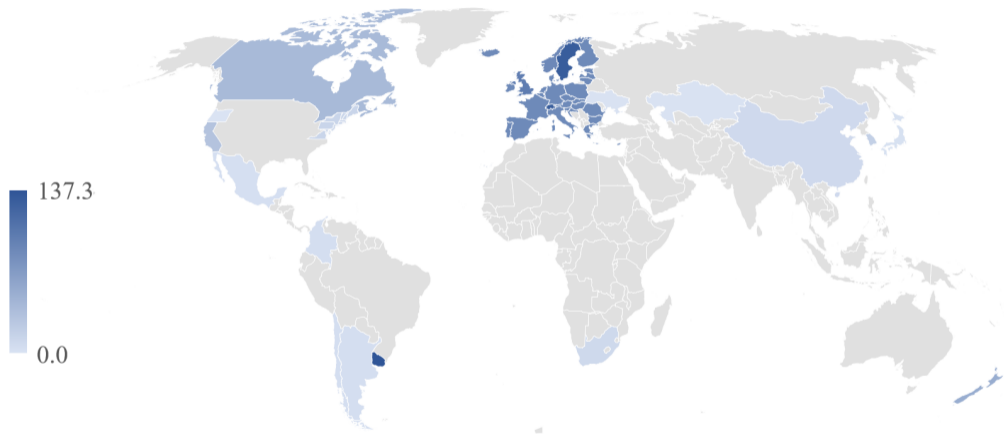
Barbalau, Chavez and Zeni (2023) "International Business and the Challenge of Financing a Just Climate Transition"

# Carbon Pricing Regulation



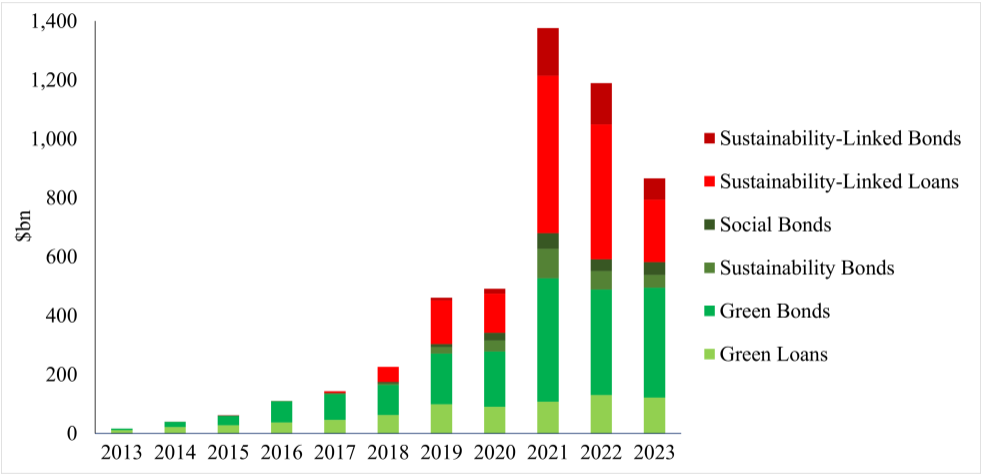
Paris Climate Agreement goals require \$5 to \$6.9 trillion per year by 2030

## Regulation-Implied Carbon Price (\$/CO<sub>2</sub>)



Environmental Protection Agency: \$190/CO<sub>2</sub> to meet Paris Agreement goals

# Global Sustainable Debt Issuance Per Year



Global market: approx \$7.5tn, out of which \$2tn sustainability-linked

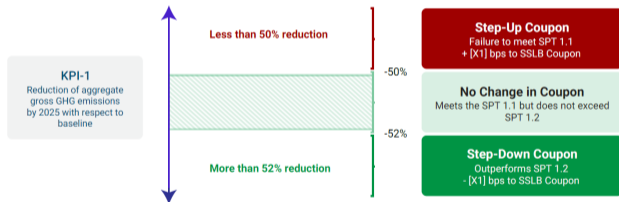
# Sustainability-Linked Debt Example

Uruguay's \$1.5bn **SLB** issued in 2022, maturing 2034

KPI: % decrease in aggregate gross GHG emissions per real GDP from 1990 to 2025

Initial coupon: % 5.75

$$\Delta \text{ Coupon} = \begin{cases} +15\text{bps} & \text{if KPI} < 50\% \\ 0 & \text{otherwise} \\ -15\text{bps} & \text{if KPI} > 52\% \end{cases}$$



Oversubscribed: \$3.96bn

Understand interaction between regulatory and financial tools for reducing carbon

- Conditions under which regulation may emerge given political constraints
- Conditions under which carbon-contingent financing may emerge
- Regulation in presence of political constraints and carbon-contingent financing
- When can financial markets substitute regulation and improve welfare?

Model of investment in polluting or non-polluting technologies

- Standard and environmental agents that behave atomistically
- Regulator chooses a carbon tax subject to **median voter constraint**
- Agents can lend and borrow using **carbon-contingent securities** with payoff to lender that (increases) decreases if borrower (fails to) achieves an emission target

$$\text{fixed} - \rho(\bar{e} - e)$$

with  $\rho$  market-implied carbon price,  $\bar{e}$  target emissions and  $e$  realized emissions

Carbon-contingent security design can be equivalent to a carbon tax

- A carbon tax corrects the laissez-faire allocation in which the polluting technology is adopted by standard agents but requires enough political support
- Absent political support for tax, carbon-contingent financing provided by environmental agents can substitute regulation and enhance welfare
- Existence of financial markets reduces support for regulation

**Why?** Environmental agents value emissions associated with their actions

Standard agents internalize possible compensation for reducing emissions

- Welfare losses can occur when reduction in political support brought about by markets is higher than the emissions reduction they enable

# Implications

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Combating climate change can be achieved without political support for carbon taxes and regulation

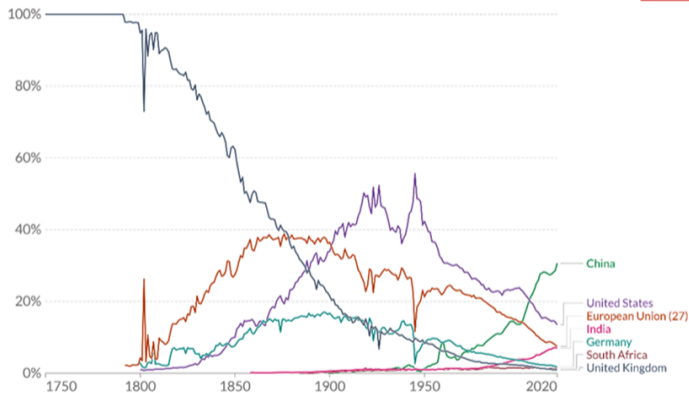
Understanding conditions under which carbon-contingent financing can substitute regulation within one economy is an important first step in thinking about transition globally

- In 2009 developed countries committed to jointly mobilize \$100bn a year by 2020 to developing countries
- Capital mobilized through sustainability-linked debt is orders of magnitude larger (\$2tn total) and has a wider reach, and has been implemented in countries where support for regulation has been insufficient
- Carbon-contingent securities can be global and avoid the problem of multinational agreement → provide carbon reduction in countries that choose not to regulate

# Historical Global Emissions

Annual share of global CO<sub>2</sub> emissions

Our World  
in Data



Source: Our World in Data based on the Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

Note: This is measured as each country's emissions divided by the sum of all countries' emissions in a given year plus international aviation and shipping (known as 'bunkers') and 'statistical differences' in carbon accounts.

Country	Share of Global Emissions (2020)
China	30.7
United States	13.5
EU (27)	7.5
India	7.0
Russia	4.5
Japan	3.0
Iran	2.1
Germany	1.9
UK	1.0

## Implications for Developed and Developing Markets

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- Funds needed to meet the Paris Climate Agreement goals are significant, e.g. \$5tn to \$6.9tn per year by 2030 (World Resource Institute, 2021), and there is disagreement about who should bear the cost
- In developed countries carbon taxes and other measures can be used to reduce emissions when there is political support
- Most developing countries will not have the funds needed or the political desire to use them for climate change if they do, preferring measures to alleviate poverty instead. They will also not have the technologies needed

## Implementation of Financial Market Solution

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For a number of reasons, developed countries cannot provide the transfers to developing countries necessary for them to combat climate change:

- Concerns about corruption will limit the political support for financial transfers
- Developed countries cannot impose requirements of carbon taxes and other government policies on the developing countries

Multinationals are uniquely placed to provide the bridge between developed countries and developing countries for technology and financial transfers

Multinationals operate extensively across borders and have internal capital markets and corporate governance mechanisms that can alleviate country-level corruption. Key advantages include size and reach, resources and technology, collaborations and partnerships, universal ownership

## Concluding Remarks

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### Theory

- Carbon-contingent financing arises when there is no political support for a tax and can fully substitute regulation if the capital deployed is large enough
- Absent support for tax, financial markets offer a welfare-improving alternative
- When support for tax exists, combined presence of carbon tax and carbon-contingent finance is never strictly beneficial

### Implications

- Carbon-contingent funds are best deployed in markets where support for regulation does not exist
- Multinational enterprises can serve as conduit

Thank You!