Not All Policies Are Created Equal: Impact of Different Climate Policy Instruments on Sustainable Investments

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Research Question

❑ Climate Policy and Sustainable Investment

- Close to US$1.3 trillion annual investments in renewables are needed by 2030 to reach the goals in the Paris Agreement (International Renewable Energy Agency, 2023).
- Energy transition will be "driven by public policy rather than by technological innovations and market forces." (Pisani-Ferry and Mahfouz (2023))

❑ Policy Efficiency

- Meanwhile, there's rising consensus that climate policies must be efficient, taking both political and economic challenges into account (Gourinchas, Schwerhoff, and Spilimbergo, 2023).

This paper:

Effectiveness

1. How do different climate policies affect sustainable investments?

Efficiency

2. What are the impact of different climate policies on the business outcomes of investment-receiving firms?
3. What are the impact of different climate policies on the environmental outcome?

Measurement and Empirical Strategy

$$y_{c,i,t+h} = \sum_{j=1}^{4} \beta_{j,h} Instrument_{c,j,t} + \boldsymbol{\theta_{c,h}} \boldsymbol{X_{c,t}} + \psi_{c,h} + \psi_{i,h} + \psi_{c,i,h} + \psi_{t,h} + \psi_{i,t,h} + \tilde{\epsilon}_{c,i,t+h}$$

❑ LHS $y_{c,i,t+h}$:

- **Investments:** Number of venture capital investments in the sustainability industries from 2000 to 2022 grouped by country-industry-year
- **Business outcomes:**
  i. **Average number of funding rounds** secured by companies of each country-industry group and founding year
  ii. **Share of companies with exits** (acquisitions or IPOs) among companies founded in the same year
  iii. **Share of inactive companies** (no funding for ≥ 5 years) among companies founded in the same year
- **Environmental outcome**: Renewable energy generation in terawatt-hours for each country-year

❑ RHS:

- **Instrument: New climate policy decisions of four instrument types** grouped by country and year. Key analyses focus on two instrument types:
  i. **Cost-imposing instruments**: carbon pricing, carbon taxes, etc.
  ii. **Revenue-providing instruments**: subsidies, funding, etc.
- $X_{c,t}$: **Control variables** (macroeconomic, policy, etc.)

❑ Method:

- **Local projection** estimated using pseudo-Poisson maximum likelihood or standard panel regression method with multiple fixed effects.
- **Assumption**: Δ(climate policies) not predicted by past investment changes and current and past international economic shocks after controlling for a battery of fixed effects are exogenous.

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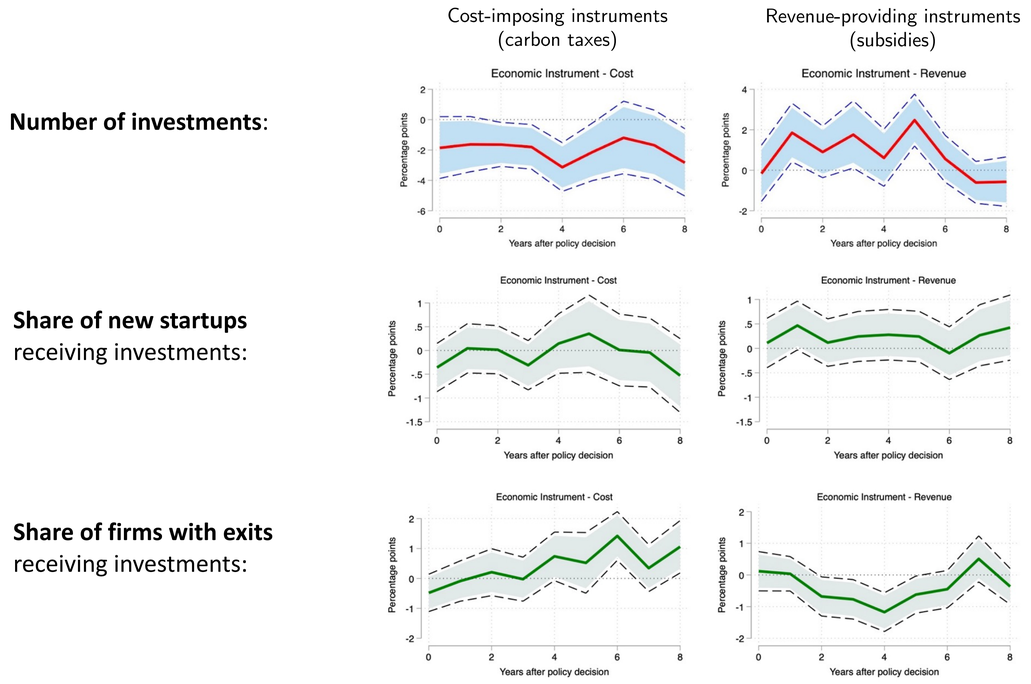
Result Highlights

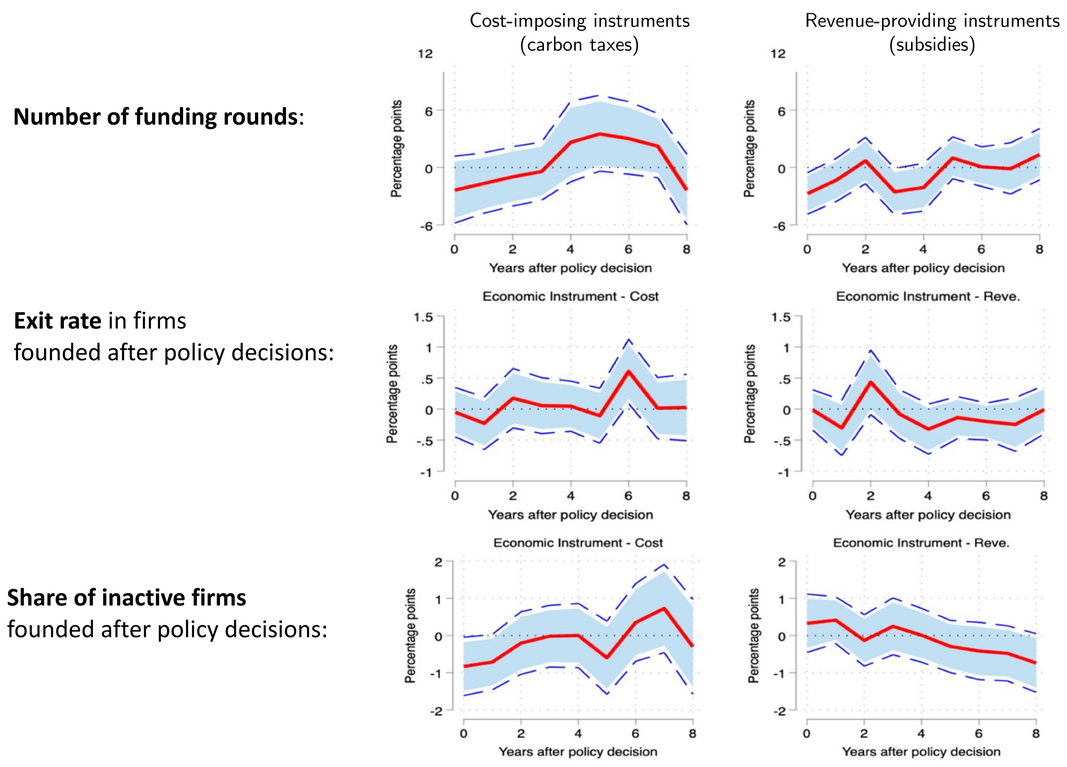
❑ Impact on Investments

- Climate policies employing subsidies encourage more sustainable investments, particularly in new startups.
- Climate policies like carbon taxes predict fewer investments, especially in new startups, but higher share of investments in firms with exits.



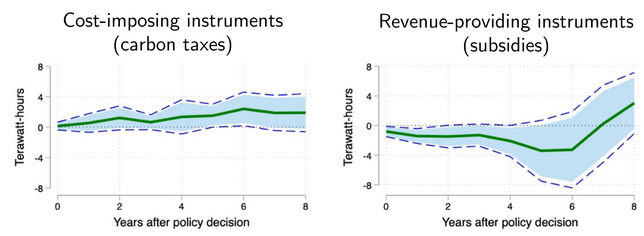
❑ Impact on Business Outcomes

- Climate policies employing carbon taxes foster favorable business outcomes:
  - ✓ more funding rounds secured,
  - ✓ higher exit rate (through acquisitions or IPOs),
  - ✓ lower share of companies becoming inactive.



❑ Impact on the Environmental Outcome

- Climate policies that employ carbon taxes lead to more renewable energy generation.



Conclusion

1. Stringent policies imposing costs on firms (e.g., carbon taxes) stifle investments in new startups, but induce investments in higher-quality companies.
2. These more stringent policies foster more favorable business outcomes in startups founded after policy decisions and significantly increase renewable energy generation.

▸ These suggest that more stringent policies, such as carbon taxes, are more efficient and effective than subsidy-based policies in driving the green transition.