Do Firm Credit Constraints Impair Climate Policy?

Matthias Kaldorf Mengjie Shi
(Deutsche Bundesbank and Goethe University Frankfurt)

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Summary

Credit-constrained firms respond less to climate policy shocks

Micro Level

- How firm credit constraints shape the pass-through of climate policy to firm-level climate performance
- Firms with **lower** distance-to-default (D2D) exhibit a **smaller** emission reduction after a carbon tax increase

Macro Level

- DSGE model with heterogeneous firms, credit frictions, carbon emissions, and emissions taxes
- Achieving net-zero emissions requires **higher** carbon taxes for **constrained** firms
- Credit frictions reduce the welfare gains from ambitious climate policy, but aggregate welfare effects remain **modest**

Empirical Strategy

$$\Delta \log(\text{Emi})_{j,t} = \beta_0 + \beta_1 \, \text{D2D}_{j,t-1} \times \Delta\text{Tax}_{c(j),t} + \beta_2 \, \text{D2D}_{j,t-1} + \beta_3 \, \Delta\text{Tax}_{c(j),t} + \beta_4 \, X_{j,t-1} + \chi_c + \delta_j \times \delta_t + \varepsilon_{j,t}.$$

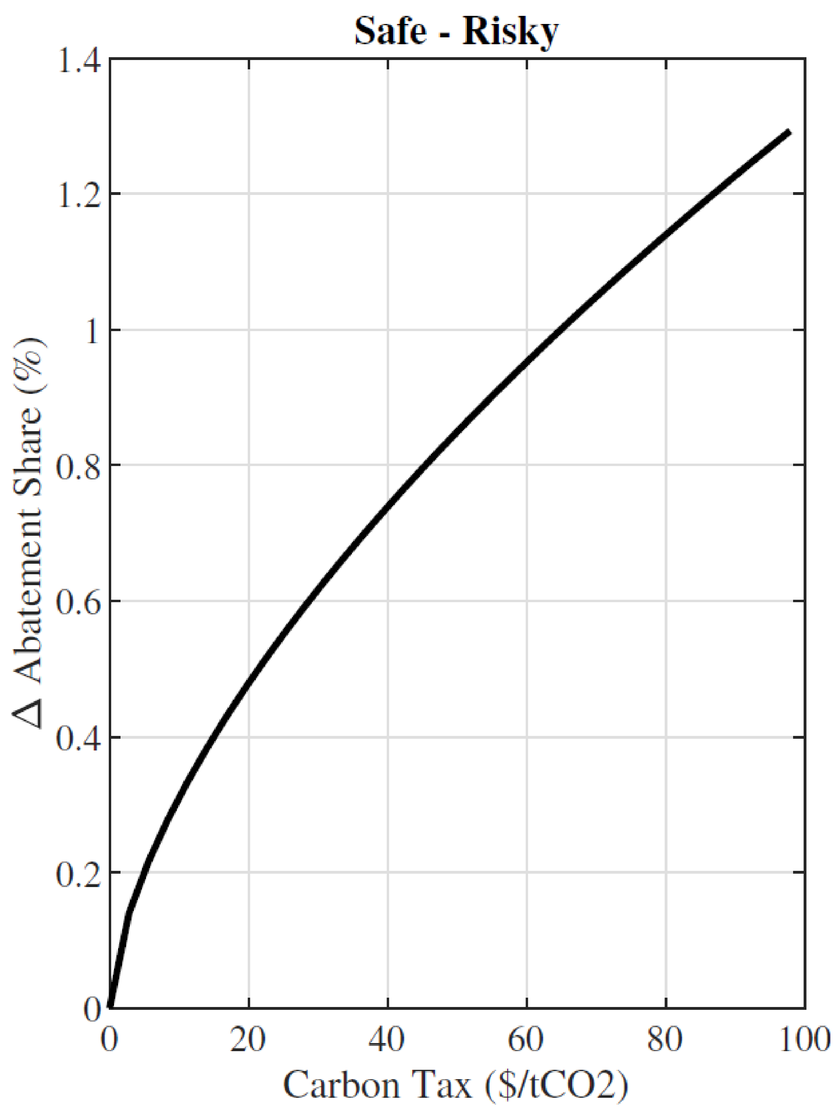
- β_1: how much credit constraints impair the pass-through of climate policy
- Firm controls and country & industry-by-year fixed effects are included; Standard errors are clustered at the country level

Empirical Results

	(1) $\Delta \log(\text{Emi})_{j,t}$	(2) $\Delta \log(\text{Emi})_{j,t}$
$D2D_{j,t-1} \times \Delta Tax_{c(j),t}$	-0.002**	-0.005***
	(0.001)	(0.002)
Sectors	All	Manuf

- A SD increase in D2D **reduces** emissions growth by 1.1 pp in full sample and 2.74 pp in manuf after a \$10/tCO$_2$ tax increase

Model Mechanism



- Credit constraints arise endogenously because firms borrow subject to default risk
- Firms facing **tighter constraints** are **less likely** to receive the payoff from abatement investments
- Credit-constrained firms **invest less in abatement** for each carbon tax level
- The abatement gap widens to about 1.3 pp at high tax levels

Net Zero Tax

	Baseline
\$10/tCO$_2$ *Tax shock*	
ΔE| constr.–unconstr. (%)	-0.35
ΔV| constr.–unconstr. (CE, %)	-0.06
Transition	
Net zero tax, unconstr. (\$/tCO$_2$)	92
Net zero tax, constr. (\$/tCO$_2$)	94
$\Delta \mathcal{T}_{2100}$| incomplete – net zero (°C)	0.01
ΔV| incomplete – net zero (CE, %)	-0.02

- **Pass-through**: constrained firms **reduce** emissions **less** after a \$10/tCO$_2$ tax increase (emission: -0.35 pp; welfare: -0.06% CE)
- **Net zero**: achieving net zero requires about **\$2/tCO$_2$ higher** taxes for **constrained** firms
- Aggregate effects are **modest** (welfare: -0.02% CE; temperature: $0.01°$C)

Further Details

Scan for the paper and appendix