Carbon Pricing and Firms' Expectations: Evidence from Italy

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Summary

Question

- Are climate policies inflationary and to what extent should central banks respond to them?
- How does carbon pricing affect firms' expectations and decisions?

Approach

- Survey data on firms' inflation and own price expectations (SIGE)
- Exogenous changes in the carbon price (Kanzig, 2023)

Key Results

- Carbon policy shocks perceived as stagflationary
  - Increase in short-term inflation expectations
  - Medium-to longer-term inflation expectations are also affected
  - Negative effects on business-specific and aggregate economic conditions
- Carbon policy shocks increase own price expectations and realised price growth (underprediction)
- Positive price forecast errors (realized - expected), in line models of information frictions
  - Increase in disagreement across firms about future aggregate price developments
    $\Rightarrow$ sticky information and rational inattention, not noisy information
  - Important role of information provision

Firm Heterogeneity

- Potential for dispersion to reflect firm heterogeneity rather than sticky vs noisy information
- Pass-through of carbon policy shocks to inflation expectations different across firms (services vs imported raw materials as intermediate inputs)
- What does the co-movement between inflation expectations and economic conditions tell us about the nature of the shock that firms expect?
  - Aggregate: a stagflationary shock
  - Individually: are there differences by type of firm, firm size, competitiveness, competition for market share or common production inputs?

Methodology

Policymakers may consider economic conditions when setting climate policy

- High frequency identification: reverse causality unlikely; economic conditions are known and priced before regulatory news
- Remaining concerns: omitted variables or correlation with demand/cost-push/labour shocks?
- Carbon policy surprise = imperfect proxy; used as instrument in Kanzig (2023) to estimate dynamic causal effects

Power problem (Nakamura and Steinsson, 2018)

- Outcome variables are low frequency; shocks aggregated from daily to monthly
- Low signal-to-noise: carbon shocks explain small share of quarterly variation

⇒ Methodological concerns (without the right context), more discussion would be helpful
⇒ DiD to exploit firm/sectoral heterogeneity: some firms/sectors affected more than others

Mechanisms

What can we learn about the supply side transmission of a climate policy shock?

- Presumably affects marginal costs (robustness section supports this)
- Firms will have to pass this through prices or absorb into profits
  - Expected own price growth useful - but are there other margins of adjustment?
  - Expectations about more adverse (local) economic conditions suggest limited ability to pass through price increases.
  - Documented effect on inflation expectations is interesting, but how do firms (plan to) respond?
    - Causal evidence: Coibion, Gorodnichenko and Kumar (2018); Coibion, Gorodnichenko and Kamdar (2018); Abberger et al. (2024)
    - BoE Inflation Attitudes Survey

Q. 15 Which, if any, of the following actions are you taking, or planning to take, in the light of your expectations of price changes over the next twelve months?
Bring forward major purchases, such as furniture or electric goods
Cut back spending and save more
Shop around more for better value goods and services
Push for increased pay with current employer
Look to increase income in other ways (e.g. change jobs, take a second job, work more hours with current employer)
Move savings out of banks or building societies into other assets such as shares, bonds, housing or gold
Take no action
Don't know

Mechanisms

What can we learn about the supply side transmission of a climate policy shock?

- Actual mechanism has important policy implications
  - Exploit rich survey and reasonable responses
  - Indirect effect potentially large
- More discussion about the nuances of communication policy (information treatment)
  - Allocative efficiency
  - Optimal information revelation for cost-push shocks (Baeriswyl and Cornand, 2010, 2011)
  - Price flexibility insures firm profits, depressing labor income and demand (Chan, Diz and Kanngiesser, 2024)

Policy Implications

- **Open question:** Are climate policies inflationary, and how should central banks respond?
- **Standard view:** Central banks should *not* respond to supply shocks
  $\Rightarrow$ Seen as transitory and may reflect welfare-improving relative price adjustments
- **Nuances depend on shock characteristics:**
  - *Anticipated vs. unanticipated* (Annicchiarico, Di Dio and Diluiso, 2024)
  - *Transitory vs. permanent* (Ambrosino, Chan and Tenreyro, 2024)
  - *One-sided vs. symmetric*

  $\Rightarrow$ Determines whether shocks are tradeoff-inducing or not

Policy Implications

Looking through may not be optimal with information frictions

- Risk is that they affect inflation expectations

  $\Rightarrow$ Expectations matter only if they affect real decisions

  Causal evidence: Coibion, Gorodnichenko and Kumar (2018); Coibion, Gorodnichenko and Kamdar (2018); Abberger et al. (2024)

- Second-round effects can amplify magnitude and persistence of inflationary pressure
  $\Rightarrow$ What is the appropriate policy response, given transmission lags?

How does carbon policy affect transmission of standard macroeconomic shocks?

- Tax: fixes price; emissions adjust. Cap-and-trade: fixes quantity; price adjusts.
- Tax keeps marginal costs unchanged: supply shocks raise output and lower inflation. Cap-and-trade raises carbon prices when output rises, dampening the impact on inflation and output.
- Cap-and-trade can act as an automatic stabiliser, improving the monetary policy trade-off.

Conclusion

- Timely and policy-relevant question
- Strong empirical foundation from rich survey evidence
- Highlights important supply-side channels of carbon policy
- Supports theory and offers a basis for uncovering key mechanisms

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