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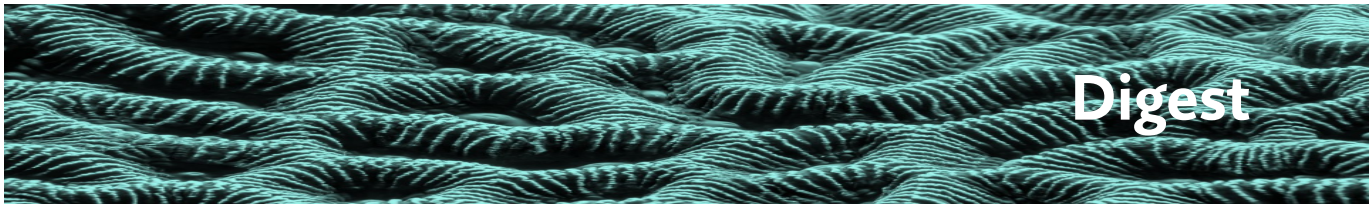

Carbon Policy, Inequality, and the Macroeconomics of the Green Transition

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The European Union has committed to achieving net-zero carbon emissions by 2050, with carbon pricing as a central policy instrument. While recent policy debates have raised concerns about the economic costs of the transition, the overall objective remains unchanged. Carbon pricing policies, however, generate important macroeconomic effects. By raising energy prices, they affect production costs, inflation, and households' real incomes, with consequences that differ across income groups. While these effects are increasingly documented in the data, much less is known about how they depend on policy design and how they shape the macroeconomic and distributional dynamics of the transition.

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Carbon policy, redistribution, and the transition path

Sardone (2026) studies the macroeconomic and distributional effects of carbon policy along the transition to net zero, with a particular focus on policy design. The paper develops an environmental dynamic general equilibrium model with heterogeneous households and nominal rigidities, and compares alternative ways of recycling carbon tax revenues, including lump-sum transfers, cuts in distortionary taxes, and subsidies to green production. The results show that the design of revenue recycling is central for both macroeconomic adjustment and distribution. In the benchmark scenario, a gradually increasing carbon tax consistent with the EU's net-zero target generates a persistent GDP loss of about 2 percent, together with higher energy prices and a temporary rise in inflation.

However, the distributional consequences differ sharply across policy designs. Transfers targeted to low-income, hand-to-mouth households are the most pro-

gressive, but they also imply larger macroeconomic costs. By contrast, subsidies and tax cuts are less contractionary, yet they provide weaker distributional relief. From a welfare perspective, recycling carbon tax revenues through reductions in distortionary labor income taxes tends to perform particularly well in the model, as it reduces pre-existing distortions while preserving the price signal induced by carbon pricing. This mechanism is closely related to the idea of a "double dividend," whereby environmental taxation not only reduces emissions but also alleviates distortions elsewhere in the economy. Its strength, however, depends on the structure of the economy and on how redistribution is implemented.

The paper also emphasizes that climate policy is a transition process, not only a change in longrun steady states. To capture this dimension, it compares a perfect-foresight benchmark with a limited-foresight scenario in which agents learn about policy targets only gradually. While longrun outcomes remain broadly similar, limited foresight generates much more volatile adjustment paths, with temporary spikes in inflation and inequality around policy announcements. Climate policy therefore affects not only long-run outcomes, but also the timing and distribution of transitional costs.

What do we know from the data?

Empirical evidence confirms that carbon pricing has tangible macroeconomic effects. Känzig (2025) identifies carbon policy shocks using high-frequency changes in carbon futures prices around regulatory updates in the EU ETS, allowing for a causal interpretation of their macroeconomic impact. The results show that a restrictive carbon policy shock raises energy prices, lowers output and employment, and increases consumer prices, consistent with a cost-push transmission channel operating through energy markets. Importantly, these effects are not evenly distributed. Using cross-country evidence for European economies and household-level data for the United Kingdom, the paper shows that poorer households are disproportionately affected. This reflects not only their higher energy expenditure shares, but also larger income losses through employment and wage channels. These findings provide a strong empirical foundation for studying carbon policy in frameworks that explicitly incorporate heterogeneity and policy design, since aggregate responses alone mask economically important distributional dynamics.

Why do effects differ across economies?

The macroeconomic effects of carbon pricing are not uniform across countries. Berthold et al. (2024) show that carbon pricing shocks lead to a decline in output and an increase in inflation, but with substantial heterogeneity across European economies. A key driver of this heterogeneity is differences in emission intensity and production structure: economies that rely more heavily on carbon-

intensive activities experience stronger contractions. Using firm-level data, the authors show that more emission-intensive firms respond more strongly to carbon pricing shocks, supporting the view that macroeconomic differences originate from heterogeneous exposure to carbon-intensive production. These findings imply that identical carbon policies can generate markedly different outcomes depending on the structure of the economy.

Why inflation and monetary policy matter?

Climate policy also interacts closely with monetary policy. Sahuc et al. (2024) embed carbon pricing in a New Keynesian framework with nominal rigidities and show that it operates as a cost-push shock, increasing firms' marginal costs and generating upward pressure on inflation while reducing output. This mechanism creates a trade-off for monetary policy. A stronger response can stabilize inflation but amplifies the contraction in economic activity, while a weaker response allows inflationary pressures to persist. Climate policy therefore introduces a distinct stabilization problem, in which inflation dynamics are not a by-product but a central channel through which its macroeconomic effects materialize.

Conclusion

Climate policy operates in an environment characterized by nominal rigidities, heterogeneous agents, and evolving expectations. Its effects cannot be reduced to the direct impact of carbon pricing on emissions. Instead, they emerge from the interaction between relative price changes, policy design, and macroeconomic adjustment. The evidence discussed above highlights three central insights. First, carbon pricing generates both aggregate and distributional effects, making redistribution an integral component of policy design. Second, the structure of the economy shapes how these effects materialize, implying that transition costs are inherently heterogeneous across countries and sectors. Third, the interaction with monetary policy determines how cost pressures translate into inflation and output dynamics over time. Carbon policy is therefore not only about pricing emissions, but about managing the macroeconomic and distributional consequences of the transition.

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