



Heterogeneous expectations and climate change

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Most policy analysis is based on rational expectations models with representative agents. However, complex systems consist of heterogeneous agents, interacting with each other and forming expectations in different ways. How do these heterogeneous expectations affect the efficacy of climate policy interventions and the way they propagate through the economy? We have selected recent research on the implications of heterogeneous beliefs for climate and monetary policy.

Barbara Annicchiarico, Fabio Di Dio and Francesca Diluiso (2022), in “[Climate Actions, Market Beliefs, and Monetary Policy](#),” ask how the economic impact of climate mitigation policies is affected when lifting the standard assumption of rational expectations. The authors use a behavioral version of a New Keynesian model that incorporates heterogeneous expectations by letting agents endogenously select one of two simple heuristics to set inflation and income expectations. Such behavioral biases, they show, may prevent agents from fully internalizing the impact of climate policies. This amplifies business cycle fluctuations and – if climate policy is implemented through cap-and-trade – jeopardizes price stability. Central banks play a key role in reducing such risks: reactive monetary policy can dampen both price and emission volatility by anchoring inflation expectations. However, if monetary policy rules react to market expectations, rather than fundamentals, it can have the opposite effect.

Emanuele Campiglio et al. (2022), in “[Believe me when I say green! Heterogeneous expectations and climate policy uncertainty](#),” investigate the impact of differential beliefs about governments’ carbon tax commitments. In their model, firms are capable of switching beliefs about future carbon policy commitment and set their levels of green and dirty investments accordingly. The authors find that slow updates of beliefs or investment choices decelerate the transition. Moreover, a negative feedback-loop between the policymaker’s credibility and firms’

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clean investment might emerge. On the supply side, long-term skepticism seems to come at a price: When firms continuously underestimate governments' carbon policy commitment, they disappear from the population of firms. Finally, revising climate objectives too often "appears to be a self-defeating policy strategy."

Alessia Cafferata et al. (2021), in "[Seeing what can\(not\) be seen: Confirmation bias, employment dynamics and climate change](#)," develop an agent-based model to study the effect of labor market conditions on the attitudes towards climate policies. Non-rationality is introduced in the form of a confirmation bias, which reduces the rate at which individuals switch between pro and contra attitudes. Based on empirical findings that show climate policy approval is higher under favorable employment conditions, the authors use the employment trend to capture individuals' economic expectations. The resulting dynamics indicate that policymakers must take advantage of favorable employment rates to successfully implement carbon mitigation policies.

Alexander Dietrich et al. (2022), in "[The Expectations Channel of Climate Change: Implications for Monetary Policy](#)," illustrate how US consumer expectations of climate change impact economic activity and monetary policy. The authors use survey evidence, showing respondents tend to overestimate the likelihood of a natural disaster with large GDP impacts, to calibrate a New Keynesian model. Higher disaster expectations decrease the natural rate of interest and increase the output gap (by 0.2 pp). Under a conventional Taylor rule, inflation declines by 0.29 pp. Monetary policy could try to limit the impact of the falling natural rate of interest. However, in practice policy makers may be constrained by the effective lower bound, which would make the contraction of output more severe.



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