

Climate-conscious monetary policy

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The scientific community has reached a consensus on the need for decarbonization to address climate change. While carbon taxation and emissions trading schemes are seen as key policy tools, there is less agreement on the role of other policy areas, including monetary policy. Policymakers have differing views on whether central banks should consider climate change in their monetary policy frameworks (see e.g. Lagarde, 2021, and Powell, 2023). In Nakov and Thomas (2023), we explore the questions surrounding the integration of climate goals into monetary policy, using a New Keynesian model with climate externalities to analyze the optimal “climate-conscious” monetary policy.

The model incorporates the use of green and fossil energy in production, with fossil energy contributing to carbon emissions and global warming. The government can impose a carbon tax to address these externalities. The paper focuses on the Ramsey optimal monetary policy, where the central bank considers climate externalities as part of its decision-making process. A first benchmark result is established: if carbon taxes follow the socially optimal path, monetary policy faces no trade-offs and can fully stabilize inflation and the welfare-relevant output gap. Strict inflation targeting allows the central bank to replicate the socially efficient equilibrium, including the optimal path of CO₂ emissions.

This benchmark result is based on the assumption that carbon taxes are set optimally from the beginning, which is unrealistic given the slow progress in carbon taxation observed in practice. Therefore, the paper examines a second relevant scenario of a “slow green transition” where the carbon tax gradually converges to its optimal level. In the slow green transition scenario, a tension arises between price stability and climate goals. Suboptimal carbon taxes during the transition lead to excessive fossil energy consumption. The central bank may have an

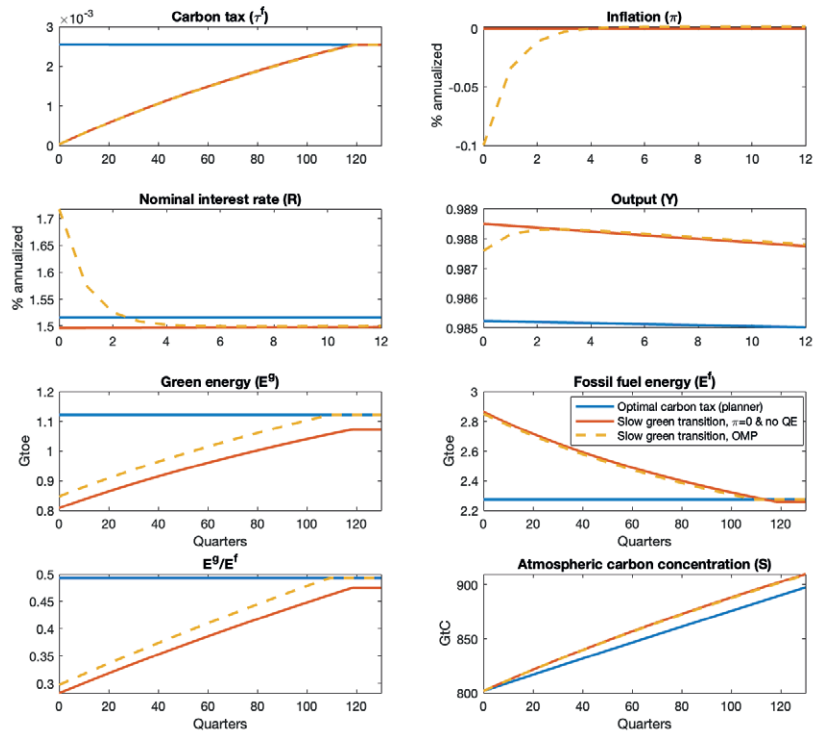
incentive to depress output to reduce energy consumption, but this comes at the cost of lowering output below its natural level, and therefore temporarily lowering inflation below target. The trade-off between price stability and climate goals is quantified using a calibrated model. The results show that the trade-off is resolved in favor of price stability, with only a minimal and short-lived departure from strict inflation targeting.

The paper also considers the use of “green QE” as a targeted instrument for addressing climate change, in the context of a model extension with financial frictions. Green QE refers to central banks tilting their corporate bond portfolios toward green bonds and away from brown bonds. Figure 1 presents the macroeconomic transition under the different scenarios regarding the path for carbon taxes and the assumed monetary policy. Under optimal carbon taxation (blue lines), strict inflation targeting is again optimal, as is full (both green and brown) QE in order to offset financial frictions. In the slow green transition scenario, under optimal monetary policy (yellow dashed lines) the central bank implements full green QE and initially refrains from purchasing any brown bonds due to the large gap between actual and optimal carbon taxes. Once the carbon tax gap narrows, the central bank buys only as many brown bonds as needed to implement the optimal fossil energy price. That is, green tilting of QE allows the central bank to compensate for the shortfall in carbon taxation. The trade-offs under the slow green transition are still resolved in favor of price stability even with green QE. Green tilting accelerates the transition, but its impact on atmospheric carbon concentration and global temperatures remains small. This is because the effectiveness of green tilting depends on the extent to which it can tighten financing conditions for brown firms and ease them for green firms, which is limited by the eligibility criteria of central bank purchase programs.

In conclusion, while monetary policy can play a role in addressing climate change, its ability to do so is limited due to the untargeted nature of conventional instruments and the design restrictions on unconventional tools, therefore emphasizing the importance of optimal carbon pricing in the transition to a low-carbon economy.

Figure 1

Transitions in green QE model: macroeconomic dynamics



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