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Three Types of Robust Ramsey Problems in a Linear-Quadratic Framework*

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Abstract

This paper studies robust Ramsey policy problems in a general discrete-time linear-quadratic framework when the Ramsey planner faces three types of ambiguity. This framework includes both exogenous and endogenous state variables. In addition, the equilibrium system from the private sector contains both backward-looking and forward-looking dynamics. We provide recursive characterizations and algorithms to solve for robust policy. We apply our method to a basic New Keynesian model of optimal monetary policy with persistent cost-push shocks. We find that (i) all three types of ambiguity make optimal monetary policy more history-dependent but with different reasons for each type; and (ii) they deliver qualitatively different initial responses of inflation and the output gap following a cost-push shock.

JEL Classification: E52, E61

Keywords: ambiguity, robustness, robust control, Ramsey policy, monetary policy

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