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Optimal monetary policy with heterogeneous money holdings ☆

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Abstract

We study the optimal anticipated policy in a pure-currency economy with flexible prices and a non-degenerate distribution of money holdings. The economy features a business cycle and lump-sum monetary injections have distributional effects that depend on the state of the cycle. We parsimoniously characterize the dynamics of the economy and study the optimal regulation of the money supply as a function of the state under commitment. The optimal policy prescribes monetary expansions in recessions, when insurance is most needed by the cash-poor unproductive agents. Conversely, the optimal policy prescribes monetary contractions during booms, so that the inflationary effect of the occasional expansions is undone.

JEL classification: E50

Keywords: Heterogeneous agents; Redistributive monetary policy; Pure currency; Precautionary savings; Friedman rule

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1. Introduction

We study the optimal monetary policy in a competitive flexible-price economy where infinity-lived agents are subject to idiosyncratic productivity shocks and money is valued in equilibrium due to anonymity. The state of this economy is described by the wealth distribution, i.e. the distribution of money holdings, which evolves through time following the history of shocks and determines the value of money and aggregate output. Our objective is to characterize how to optimally regulate the money supply as a function of the state of the economy, what we call an optimal state-dependent monetary policy. A key feature of the setup is that monetary policy affects the wealth distribution, as in Wallace (1984) or Berentsen et al. (2005) and many other monetary models whose first principles are explicitly spelled out. Although the propagation of such redistributive effects of monetary policy is often "muted" by means of appropriate assumptions for the sake of tractability, as in Lucas (1990), Shi (1997), or Lagos and Wright (2005), in this paper we use an analytically tractable setup that allows us to study the role of systematic monetary policy taking fully into account the dynamics of the wealth distribution. The key assumption for tractability, following Scheinkman and Weiss (1986), is that we consider the simplest economy with time varying wealth distribution, namely one with two types of agents. We see this as a convenient starting point to study the interactions between the dynamics of the wealth distribution and monetary policy.

We think the question is interesting because it is novel in the theory and because the analysis provides a framework to interpret the large monetary expansions, sometimes observed during deep recessions, with a mechanism that is completely different from the canonical one relying on sticky prices.[1] The properties of an optimal monetary policy in models where incomplete markets and heterogeneous agents allow for a potential redistributive role of monetary policy were first studied by Levine (1991). They have since been explored in a variety of contexts by Kehoe et al. (1992), Imrohoroglu (1992), Shi (1999), Bhattacharya et al. (2005), Molico (2006), Manuelli and Sargent (2010), Algan et al. (2011), and Rocheteau et al. (2015), for example. A common feature of these models is a tension between the benefits of a contractionary policy, i.e. one that yields an efficient return on money as under Friedman's rule, and the benefits of an expansionary policy, which provides partial insurance to cash-poor agents. A novelty of this paper is that, while previous models focused on a constant rule, i.e., seeking the optimal constant rate of monetary expansions, we consider a state-dependent monetary policy in which the rate of monetary expansion depends on the state of the economy.

Our model extends Scheinkman and Weiss's (1986) analysis, which assumes a constant money supply, by letting the government control the money supply through lump-sum transfers.[2] We provide a characterization of the price of money and of aggregate production in terms of the policy rule in a competitive equilibrium. We adopt an ex-ante welfare criterion and characterize an efficient monetary policy by solving a Ramsey problem. Our results cast some light on the interactions between the dynamics of the wealth distribution and the optimal anticipated policy. The main policy choice is a tradeoff between providing insurance (through monetary expansions) and ensuring an efficient return on savings (through monetary contractions). As argued

[1] The assumption of flexible prices is useful to emphasize the workings of the redistributive role of monetary policy, and to distinguish it from the better understood mechanism that arises with sticky prices.

[2] As in Levine (1991) we assume that the government does not know which agent is productive, so that the transfers are equal across agents. See Kehoe et al. (1992) for a thorough discussion of this assumption and in particular Levine (1991) for a derivation of the equal-treatment restriction from first principles.