



Recursive monetary policy games with incomplete information

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Abstract

This paper provides recursive methods for analyzing the credible equilibria of an incomplete information monetary policy game. The policy game is one in which a discretionary government has a short-run temptation to engage in a surprise monetary expansion. It also has the opportunity to imitate a government that always implements the ex ante optimal monetary policy actions. We derive an algorithm for computing the set of credible equilibrium payoffs. We use this algorithm to explore the idea that incomplete information monetary policy games of this kind have fewer equilibria and less indeterminacy than their complete information counterparts.

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1. Introduction

This paper considers the credibility of monetary policy in settings in which the government's attachment to a low monetary growth objective may initially be unknown. We assume two types of government. The first pursues a low monetary

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growth policy regardless of the behavior of private agents; the second seeks to maximize the utility of the representative household. This second or ‘discretionary’ type faces a short-run temptation to increase the monetary growth rate above the low ex ante optimal level. While it has no means of directly committing to a monetary policy, it can imitate a government with a preference for low monetary growth and in doing so, persuade private agents that low monetary growth is likely in the future. We investigate how this imitation option affects the structure of credible equilibria and the corresponding set of credible monetary policies. In pursuing this objective, we derive recursive methods for numerically characterizing credible equilibria in incomplete information policy games. These games are explicit in their treatment of private agents; they incorporate a simple, yet fully specified dynamic general equilibrium model.

Our main qualitative result is that when the government is the discretionary type, but the public are initially uncertain of this, then as the representative household’s discount factor converges to 1, the set of credible equilibrium payoffs collapses to a neighborhood of the ex ante optimal one. This result builds on, and extends to a monetary policy setting, the earlier game theoretic work of Fudenberg and Levine (1989). It implies that competitive allocations characterized by high monetary growth and inflation are not credible when the discretionary government is patient and can imitate. Imitation may or may not occur in equilibrium, but the option to imitate constrains the set of credible allocations and policies. Essentially, it provides a discretionary government with a means of managing the expectations of private agents.

The contrast between incomplete and complete information games in which the government is known at the outset to be discretionary is striking. For all values of the discount factor, the latter admit low payoff equilibria. Such equilibria are characterized by severe ‘expectation traps’ in which firms anticipate high future monetary growth and raise prices at a correspondingly rapid rate. In the physical environment of this paper, the resulting inflation acts as a tax on the labor input, deterring effort and reducing consumption. A failure to accommodate creates a recession, but does not dampen these inflationary expectations. Consequently, it is optimal for the discretionary government to accommodate; it lacks the escape route that imitation provides in an incomplete information game. Moreover, in complete information settings, the degree of multiplicity is increasing in the government’s discount factor and is large, not small, when the government is patient. A standard Folk theorem ensures that low monetary growth-low inflation allocations can be sustained as credible equilibria when the government is patient enough (see, for example, Ireland (1997) or Chari et al. (1998)). Such multiplicity and, in particular, the existence of extremely severe expectation trap equilibria is often seen as a problem for complete information models.¹

¹Discussions of the difficulties, both normative and positive, for policy analysis created by such multiplicity can be found in Barro (1986), Ireland (2000) and Stokey (1991) amongst others. The literature has often imposed additional equilibrium selection criteria. For example, Albanesi et al. (2003) consider Markov equilibria, while Sleet (2001) considers optimal equilibria.

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