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# Optimal inflation target under uncertainty☆

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**Abstract**

We derive an optimal state-contingent inflation target in an economy under uncertainty. This inflation target can improve inefficiencies stemming from two sources: the lack of commitment to predetermined policies and the lack of coordination between the monetary and fiscal authorities. We then discuss the pros and cons of our proposal compared with the solution proposed by Beetsma and Bovenberg [Beetsma, R.M.W.J., Bovenberg, A.L., 2001. When does an inflation target yield the second best? Scandinavian Journal of Economics 103, 119–126], paying special attention to their practical feasibility. We will show that in some countries where there is a highly independent central bank, our proposal is more attractive.
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## 1. Introduction

In the present paper, we propose an institutional set-up that replicates the second-best equilibrium derived by Beetsma and Bovenberg (henceforth BB) (2001), and we argue that in some countries our proposal is easier to implement from a practical point of view. BB (2001) studies an economy where a central bank sets the rate of inflation and a fiscal

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authority determines a tax rate to finance fiscal expenditure. The central bank is independent from the fiscal authority and is subject to an inflation bias because of the following two reasons: first, the central bank cannot commit itself to the second-best rate of inflation since given the private sector's expected rate of inflation, it has an incentive to expand the output beyond the second-best level (the non-commitment problem). Second, the central bank fails to regard seigniorage revenue as an inflation tax which affects the government consolidated budget constraint, because the bank is independent from the government (the non-coordination problem). BB (2001) shows that the inefficiency stemming from those two biases can be resolved and the second-best outcome can be attained by appointing a central banker that attaches smaller weight to inflation stabilization than the public does, and by imposing a strict and constant inflation target on this central banker. [1]

We demonstrate that there is an alternative institutional set-up that replicates the second-best outcome in the economy studied by BB (2001). First, we demonstrate that an elaborately designed state-contingent inflation target can achieve the second-best outcome. We can also show that theoretically this state-contingent inflation target can be replicated as a simple ''government budget-contingent'' target which depends on the amount of ex-post total government expenditure. Since the amount of government expenditure is easily observed, this target scheme is easy to implement in practice.

We then compare the pros and cons of our proposal relative to those of BB (2001), paying special attention to their practical feasibility. In order to attain the second-best outcome, our proposal requires only a state-contingent inflation target, whereas that of BB needs both a constant inflation target and fine tuning of central bankers' conservativeness. Since it is practically difficult to adjust the level of their conservativeness, our solution has one clear advantage over that of BB (2001).

Beetsma and Jensen (1999) criticizes a state-contingent target scheme since it is less credible and more likely to be subject to the critique made by McCallum (1995). However, there are countries to which this critique does not apply. In countries where there is a highly independent central bank, the inflation target is introduced together with prudent fiscal policies. Therefore, it is politically difficult for the government to set a new inflation target that does not lead to the second-best outcome by, for example, changing the central bank law. In summary, the state-contingent inflation target derived in the present paper is an important practical option in these countries.

The rest of the paper is organized as follows. Section 2 is devoted to a theoretical explanation of our inflation target scheme. We study an equilibrium where two policy

[1] There are several studies which deal with these topics using slightly different models. First, regarding the lack of coordination between the monetary and fiscal authorities, BB (1997b) considers a one-period model and BB (1997a) examines a multi-period model. However, these studies consider neither a stochastic shock nor the role of targeting schemes, while the present study and BB (2001) examine these two issues. Second, Fujiki et al. (in press) consider the situation where two policy makers do not coordinate. However, the authors do not restrict their attention to an independent central bank constrained by a targeting scheme as the present paper and BB (2001) do. They also consider an integrated agency, which determines both monetary and fiscal policies. Their study also differs from the present one and BB (2001) in that there are no stochastic shocks. Finally, a dynamic economy subject to stochastic shocks is considered in BB (1999) in which there are an independent central bank and multiple fiscal authorities, which is similar to an economy in the European Monetary Union. However, they ignore the non-coordination problem between fiscal and monetary policies, which is the focus of this paper.

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