An explicit inflation target as a commitment device

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Abstract

This paper shows an avenue through which a numerical long-run inflation target ensures low inflation and high credibility; one that is independent of the usual Walsh incentive contract. Our novel game theoretic framework – a generalization of alternating move games – formalizes the fact that since the target is explicit (legislated), it cannot be frequently reconsidered. This 'explicitness' therefore serves as a commitment device. There are two key results. First, it is shown that if the inflation target is sufficiently rigid/explicit relative to the public's wages, low inflation is time consistent and hence credible even if the policymaker's output target is above potential. Second, it is found that the central banker's optimal explicitness level is decreasing in the degree of his patience/independence (due to their substitutability in achieving credibility). Our analysis therefore offers an explanation for the 'inflation and credibility convergence' over the past two decades as well as the fact that inflation targets were legislated primarily by countries that had lacked central bank independence like New Zealand, Canada, and the UK rather than the US, Germany, or Switzerland. We show that there exists fair empirical support for all the predictions of our analysis.

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1. Introduction

The paper attempts to contribute to the inflation targeting debate (that is heated especially in regards to the US – see e.g. Bernanke and Woodford, 2005, McCallum, 2003, Friedman, 2004, Mishkin, 2004) by proposing novel explanations to the following two questions: (i) what has driven the widespread adoption of explicit inflation targets (ITs) over the past two decades? and (ii) why have some countries been more explicit than others in targeting low inflation?

The effect of an explicit IT has commonly been modeled through a Walsh (1995b) type incentive contract with the central banker. The offered example has been the accountability arrangement in New Zealand where the Governor is personally responsible for achieving the target and can lose his job if he fails to do so (see e.g. Walsh, 1995a). While this certainly captures a part of the story it has been criticized since other IT countries have not adopted such a dismissal procedure and still achieved desirable inflation and credibility outcomes.

We propose an alternative channel through which inflation targeting works. It has been spelled out on numerous occasions (e.g. Bernanke et al., 1999, Svensson, 1999) that one of the key features of the regime is the fact that the inflation target is explicit, i.e. transparently grounded in the central banking legislation. The main innovation of our paper is incorporating this 'explicitness' of the IT in the *timing structure* of the monetary policy game. This takes note of the fact that a legislated target is rigid, i.e. it may not be reconsidered every period. Such inability introduces some asynchronicity in the game and means that an explicit IT effectively acts as a commitment device.

Our game theoretic framework is a generalization of alternating move games by Maskin and Tirole (1988) and Lagunoff and Matsui (1997) that follows the recommendation of Cho and Matsui (2005): '[a]lthough the alternating move games capture the essence of asynchronous decision making, we need to investigate a more general form of such processes...'.[1] Let us demonstrate the framework using an example of a timeline in Fig. 1.

The public, player p, will form expectations every period but will only be able to reconsider the wage – its instrument similarly to Rogoff (1985) – every $r^p \geqslant 1$ periods. Following Taylor (1979) we will refer to r^p as *wage rigidity*. The policymaker, player g, can adjust inflation every $r^g \geqslant 1$ to which we refer as (*long-run*) *commitment*.[2]

Since our paper focuses on trend/average monetary policy outcomes our economy will be deterministic. This implies that the policymaker's instrument represents setting *average* inflation or a certain level of a *long-run* inflation target. Long-run means that the legislated horizon of the target is the business cycle or longer (indefinite) – as is common in industrial countries, see Mishkin and Schmidt-Hebbel (2001). It then follows that r^g can be interpreted as the degree of the target's 'explicitness' – the more explicitly the inflation target is stated in the central banking legislation the less frequently it can be altered (in the

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[1] Our companion papers Libich and Stehlik (2006, 2007) postulate this framework also in continuous time and in time scale calculus (a recent general mathematical environment that nests both discrete and continuous time as special cases, see e.g. Bohner and Peterson, 2001). Further, the papers apply the framework to other classes of games (e.g. the Battle of Sexes or the Coordination game).

[2] The setup makes it apparent that our commitment concept is very different from the standard pre-commitment solution popularized by Woodford (1999) and Clarida et al. (1999) in which $r^g = 1$. The links between the two concepts are discussed in Libich (2006).