



Note on ‘Loss of monetary discretion in a simple dynamic policy game’

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Abstract

Jensen (1994a) finds that loss of monetary discretion leads to lower welfare. However, by extending his model we show that if real base money holdings are relatively low, as is likely to be the case for modern economics, a zero-inflation rule may well be preferable to monetary discretion. If the emphasis on achieving the output and public spending targets falls, a zero-inflation rule is more likely to be preferred. The increased support for binding policy rules thus conforms with a less tolerant attitude towards inflation.

Key words: Monetary discretion; Zero inflation rule; Real money holdings

JEL classification: E52; E61; E63

1. Introduction

In a recent article Jensen (1994a) shows that loss of monetary discretion (i.e., a zero-inflation rule) by a policymaker who is unable to commit is welfare deteriorating. This result, however, depends on the assumption that real money holdings are relatively large, so that seigniorage revenues play an important role in financing government expenditures. In this note we will show that if base

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money holdings are small, as is likely to be the case for modern economies characterised by efficient payments systems and the absence of financial repression, a zero-inflation rule may well be preferable to monetary discretion. We also show that if the relative utility weights attached to the output and public spending targets fall, a zero-inflation rule is more likely to be preferred for given real money holdings. The recent increase in the support for binding policy rules therefore conforms with a diminished tolerance towards inflation.

2. Loss of monetary discretion

The model and the notation follow Jensen (1994a). Aggregate output in period t is

$$y_t = \alpha(\pi_t - E\{\pi_t | I_{t-1}\} - \tau_t), \quad \alpha > 0, \quad \forall t \geq 0, \quad (1)$$

where y_t is (log) output, τ_t is the tax rate on firms' revenues, π_t is the inflation rate, and $E\{\pi_t | I_{t-1}\}$ is the (rationally) expected inflation rate conditional upon the information set I_{t-1} which is available at the moment the nominal wage contracts are concluded.

Assume that real money holdings are a constant fraction $\kappa \geq 0$ of \tilde{Y} , which is some fixed output measure (cf., e.g., Canzoneri, 1985; Alesina and Tabellini, 1987). If the tax rate is not too high and the inflation surprise, $\pi_t - E\{\pi_t | I_{t-1}\}$, is not too large, the government budget constraint can be approximated by^{1,2}

$$d_{t+1} = rd_t + g_t - \tau_t - \kappa\pi_t, \quad (2)$$

where d_t and d_{t+1} are, respectively, old and new single-period indexed debt as a share of \tilde{Y} . Furthermore, g_t is government expenditures as a share of \tilde{Y} and $r > 1$ is one plus the interest rate on debt. The term $\kappa\pi_t$ measures seigniorage revenues from money creation. While Jensen (1994a) assumes that $\kappa = 1$, we allow for κ to be different from unity.

The intertemporal utility function is $\sum_{t=0}^{\infty} \beta^t u_t(y_t, g_t, \pi_t)$, where $0 < \beta < 1$ is the discount factor (assuming that $\beta r > 1$, which is necessary for stability) and where

$$u_t(y_t, g_t, \pi_t) \equiv -\{\mu_1 y_t^2 + \mu_2 (g_t - \tilde{g})^2 + \pi_t^2\}, \quad (3)$$

$$1 > \tilde{g} > 0, \quad \mu_1 > 0, \quad \mu_2 > 0,$$

¹ Details of this and ensuing derivations are available from the authors upon request.

² Our conclusions agree with those reached in Jensen (1994b, Ch. 4), were the same analysis is conducted in terms of levels rather than output shares and with the use of the exact government budget constraint. This approach, however, precludes closed-form solutions and is therefore analytically much less tractable.

is the per-period utility function. Furthermore, \tilde{g} is the target for public spending.

A derivation similar to the one in Jensen (1994a) yields the (equilibrium) welfare under discretion

$$- \Theta \left[\frac{\beta r^2}{\beta r^2 - 1} \right] \left[\frac{\beta r^2 - 1}{(1 + \gamma)\beta r^2} \left[\frac{r}{r - 1} \tilde{g} + r d_t \right] \right]^2, \tag{4}$$

where $\gamma \equiv \kappa(1 + \kappa)\mu_2 + \mu_2/(\mu_1\alpha^2)$ and $\Theta \equiv \mu_2[\mu_2(1 + \kappa)^2 + 1 + \mu_2/(\mu_1\alpha^2)]$. The (equilibrium) welfare under a zero-inflation rule ($\pi_t = 0, \forall t \geq 0$) is (Jensen, 1994a, Eq. (20))

$$- \hat{\Theta} \left[\frac{\beta r^2}{\beta r^2 - 1} \right] \left[\frac{\beta r^2 - 1}{(1 + \hat{\gamma})\beta r^2} \left[\frac{r}{r - 1} \tilde{g} + r d_t \right] \right]^2, \tag{5}$$

where $\hat{\gamma} = \mu_2/(\mu_1\alpha^2)$ and $\hat{\Theta} \equiv \mu_2[1 + \mu_2/(\mu_1\alpha^2)]$.

Hence, a zero-inflation rule results in higher welfare than monetary discretion if and only if $\hat{\Theta}/(1 + \hat{\gamma})^2 < \Theta/(1 + \gamma)^2$. This condition implies a (unique) critical value κ^* for κ between zero and one (the case of Jensen, 1994a). For relatively low real money holdings ($0 \leq \kappa < \kappa^*$) a zero-inflation rule is preferable, while monetary discretion is preferred if money holdings are relatively high ($\kappa > \kappa^*$). The intuition is that if κ is small, the socially useful role of inflation in the form of seigniorage revenues is dominated by the additional welfare losses associated with the inflationary bias under monetary discretion (if $d_t > -\tilde{g}/(r - 1)$, i.e., the stock of public debt exceeds its steady state level). For modern economies characterised by efficient payments systems and the absence of financial repression and, hence, low base money holdings,³ a zero-inflation rule may therefore be preferable to monetary discretion.

One can show that κ^* is decreasing in μ_1 and μ_2 . In other words, if the relative importance of attaining the output and public spending targets diminishes and, hence, the need for seigniorage revenues becomes less important, a zero-inflation rule is more likely to be preferred (for given $\kappa < 1$).⁴ This contrasts with Jensen (1994a), where even inflation-averse governments would oppose losing monetary discretion. The current extended model thus seems more reasonable as it shows that increased support for restricting discretionary monetary policymaking (e.g., through pegging the exchange rate to a stable currency – as in the European Monetary System) conforms with a less tolerant attitude towards inflation.

³ Narrow money holdings of OECD members, as measured by M1, are typically (far) below one-third of annual GDP (see, e.g., OECD, 1995).

⁴ One can also show that κ^* is decreasing in the slope of the expectations-augmented Phillips curve, α . The reason is that, if α increases, there is more need for seigniorage revenues to reduce taxes, because a given positive tax rate causes a larger fall in output.

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