

Cho, In-Koo

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Discussion of Evans and Honkapohja, "Policy interaction, expectations, and the liquidity trap"

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Discussion of Evans and Honkapohja, "Policy Interaction,
Expectations, and the Liquidity Trap"

In-Koo Cho

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In-Koo Cho, University of Illinois at Urbana/Champaign

Abstract: The result of Benhabib, Schmitt-Grohé, and Uribe (2001) is powerful because it relies only on three rather natural conditions: the Fisher equation, the convex Taylor rule, and the lower bound of the nominal interest rate. Their result is striking because the paper reveals the peril of the active Taylor rule, which has been shown to implement the target in a stable manner under various conditions. In a related paper, Benhabib, Schmitt-Grohé, and Uribe (2002) proposed a number of policies designed to avoid the liquidity trap outcome. One is to link government's spending to the inflation rate. Subject to the intertemporal budget constraint, the government's taxation on the private sector decreases as the inflation rate drops, causing the budget of the private sector to increase. Consequent increases in aggregate demand and the price level push the economy away from the liquidity trap. This sort of fiscal policy is considered “active” in the sense that the policy can increase the government budget deficit, in contrast to the “passive” fiscal policy which is designed to maintain or lower the budget deficit.

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Please address questions regarding content to In-Koo Cho, Department of Economics, University of Illinois at Urbana-Champaign, 330 Wohlers Hall, 1206 S. Sixth Street, Champaign, Illinois 61820, 217-333-0120, inkoocho@uiuc.edu.

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Discussion of Evans and Honkapohja, “Policy Interaction, Expectations, and the Liquidity Trap”

1 Introduction

The result of Benhabib, Schmitt-Grohé, and Uribe (2001) is powerful because it relies only on three rather natural conditions: the Fisher equation, the convex Taylor rule and the lower bound of the nominal interest rate. Their result is striking because the paper reveals the peril of the active Taylor rule, which has been shown to implement the target in a stable manner under various conditions. In a related paper, Benhabib, Schmitt-Grohé, and Uribe (2002) proposed a number of policies designed to avoid the liquidity trap outcome. One is to link government’s spending to the inflation rate. Subject to the intertemporal budget constraint, the government’s taxation on the private sector decreases as the inflation rate drops, causing the budget of the private sector to increase. Consequent increases in aggregate demand and the price level push the economy away from the liquidity trap. This sort of fiscal policy is considered “active” in the sense that the policy can increase the government budget deficit, in contrast to the “passive” fiscal policy which is designed to maintain or lower the budget deficit.

2 Objectives

Yet, the weakest link in Benhabib, Schmitt-Grohé, and Uribe (2001) and Benhabib, Schmitt-Grohé, and Uribe (2002) is the behavioral assumption of the decision makers. The outcome path that converges to the liquidity trap equilibrium is highly complex, often involving a spiral path around the initial point before moving toward the liquidity trap equilibrium. Moreover, there are many such paths from the neighborhood of the normal outcome. Considering the complexity and indeterminacy of the outcome paths, it would be excessive to assume that the agents are capable of perfectly foreseeing the future path, and then choosing the optimal action in each period based on the perfect foresight.

This paper asks whether the prediction of Benhabib, Schmitt-Grohé, and Uribe (2001) and the policy prescription of Benhabib, Schmitt-Grohé, and Uribe (2002) survive “small” changes in the forecasting capability of the players. Formally, if we replace the perfectly rational agents in Benhabib, Schmitt-Grohé, and Uribe (2001) by boundedly rational agents, who form their forecast based on their past experience,

1. does the liquidity trap equilibrium remain a focal point equilibrium that justifies our concern for the “peril” of the Taylor rule?
2. does the active fiscal policy remain a sensible policy for helping the economy to get out of the liquidity trap outcome?

This paper by Evans and Honkapohja offers a remarkably clear and insightful answer, raising a serious challenge to the prediction of Benhabib, Schmitt-Grohé, and Uribe (2001). It first shows that if the agents are adaptive learners, then the low inflation outcome is not stable.¹ But, the paper goes one step further. If the agents are adaptive learners, then the low inflation outcome *is* stable under the active fiscal policy. This conclusion directly challenges the policy prescription of Benhabib, Schmitt-Grohé, and Uribe (2002), and raises a question about the robustness of the prediction of Benhabib, Schmitt-Grohé, and Uribe (2001) that claims the low inflation outcome should be a focal point.

Interestingly, however, this paper does not save us from the perils of the Taylor rule. Even though the low inflation outcome in Benhabib, Schmitt-Grohé, and Uribe (2001) is no longer stable but the normal outcome is stable under the adaptive learning, there is another locally stable outcome that induces even lower inflation. Rather than pulling us out of the perils of the Taylor rule, this paper reveals an even more serious “peril” associated with the Taylor rule that the economy might face for a long time.

It is very creative how the authors generated the new low inflation outcome by making a seemingly small change to the framework of Benhabib, Schmitt-Grohé, and Uribe (2001). Because this change is a critical element that leads to the main conclusion of the paper, a careful examination is warranted.

3 Two Bounds

To illuminate the difference from Benhabib, Schmitt-Grohé, and Uribe (2001), let me use the same economy with three basic components: the Fisher equation

$$R = \beta^{-1}\pi, \tag{3.1}$$

the convex Taylor rule

$$R - 1 = \theta f(\pi), \tag{3.2}$$

and the lower bound for the nominal interest rate

$$f(\pi) \geq 0 \tag{3.3}$$

so that $f(\pi)$ intersects the Fisher equation at two different levels of inflation, π_L and π_H where

$$\pi_L < \pi_H.$$

¹See also Bullard and Mitra (2000).

Let us call π_H a normal outcome, as it is often the target set by the policy maker, while π_L is the low inflation outcome.

Under perfect foresight dynamics, Benhabib, Schmitt-Grohé, and Uribe (2001) demonstrated that π_H is not stable: in any small neighborhood of π_H , one can find an initial condition from which the trajectory induced by perfect foresight dynamics leads to π_L . On the other hand, Bullard and Mitra (2000) demonstrated that π_H is a stable point under a wide class of adaptive learning algorithms in which the agents form an expectation about the inflation rate according to

$$\pi_{t+1}^f = \pi_t^f + \phi_t(\pi_{t-1} - \pi_t^f),$$

where $\phi_t > 0$.²

An important twist to this basic setting is to introduce two bounds: $\tilde{\pi}$ and $\hat{\pi}$ as the lower and the upper bounds of the range of inflation rates, over which the convex Taylor rule is implemented. Once π hits the lower bound $\tilde{\pi}$, the government switches to a different monetary policy regime that keeps the inflation rate from falling further. Similarly, the government switches to a different monetary policy regime which ensures that the inflation rate does not exceed $\hat{\pi}$, once the inflation rate hits $\hat{\pi}$. Let us assume that

$$\tilde{\pi} < \pi_L < \pi_H < \hat{\pi}.$$

These bounds create a new steady state $(\tilde{\pi}, \tilde{R})$ where

$$\tilde{R} = \beta^{-1}\tilde{\pi}.$$

This lower bound in fact has the very feature of the liquidity trap equilibrium. To contrast this outcome with π_L , let us call $\tilde{\pi}$ the liquidity trap outcome.

Around \tilde{R} , the nominal interest rate changes more quickly than the inflation rate does, which renders $\tilde{\pi}$ a stable outcome under recursive learning. Now, we have two locally stable outcomes, $\tilde{\pi}$ and π_H , and one locally unstable outcome π_L under the recursive learning algorithm. The learning algorithm in combination with the two bounds creates a new liquidity trap outcome, which is stable. This conclusion is valid if the monetary policy maker has no access to fiscal policy.

If the policy maker also has access to fiscal policy, the stability of the outcome is influenced by the nature of the fiscal policy. A key finding is Proposition 5, which states that the low inflation outcome π_L is stable under adaptive learning dynamics, if the fiscal policy is active. This finding is in sharp contrast to Benhabib, Schmitt-Grohé, and Uribe (2001), that prescribed the active fiscal policy as a way to avoid the liquidity trap.

Under the learning dynamics, π_L is not stable because the nominal interest rate does not change as quickly as the inflation rate does in its neighborhood. For example, if the inflation rate increases unexpectedly, then the agent's forecast about the nominal interest rate shifts. Because the slope of the Taylor rule is less than 1 around π_L , the agent's

²One can find a similar reversal of the stability property of stationary solutions in Marcet and Sargent (1989).

forecast about the inflation rate in the following round falls short of the actual inflation rate. This difference pushes the forecasted inflation even further away from the stationary point. However, if the government's tax is progressively linked to the interest rate in order to pay off the debt, then the increased tax reduces disposable income, which leads to lower demand and alleviates the inflationary pressure. The interaction between the fiscal policy and the monetary policy makes π_L stable, in contrast with what Benhabib, Schmitt-Grohé, and Uribe (2001) predicts. Instead, this paper claims that under the passive fiscal policy, which does not change the tax in response to changes in the nominal interest rate, π_L remains unstable.

However, the instability of π_L does not imply that the economy is not trapped in the liquidity trap outcome. Because $\tilde{\pi}$ is locally stable, it is possible that the economy will stay around $\tilde{\pi}$ for an extended period of time.

4 Challenge or Vindication

Given Benhabib, Schmitt-Grohé, and Uribe (2001) as the benchmark, I view this paper as posing a challenge. The main conclusion could support our intuition that the active Taylor rule is stable. But, at the same time, the economy might slip down toward the liquidity trap outcome before moving back to the normal outcome. Thus, this paper can explain the dynamics away from the normal outcome to the liquidity trap outcome, without compromising the stability of the active Taylor rule.

This conclusion is based on a modification of the basic model by introducing two bounds. The modification generates a new stationary point, which could be unstable under perfect foresight dynamics but stable under learning dynamics. This is in sharp contrast to the original model of Benhabib, Schmitt-Grohé, and Uribe (2001), which has two stationary points, one stable and the other unstable under perfect foresight dynamics. If the system has three stationary outcomes, two of which are unstable, then it is still possible that there exists a stable orbit that passes through the neighborhood of the two unstable outcomes. If such an orbit exists, then the stable orbit might have a feature of fluctuation between the normal outcome and the "new" liquidity trap outcome. This paper could be a vindication of what perfect foresight dynamics predict.

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