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Monetary policy credibility and inflationary expectation

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ABSTRACT

Since there are significant biases in the individuals' inflationary expectations, the role of monetary policy credibility needs to be reconsidered. Theoretically, policy credibility can influence the policymaker's plan of action or reflect his preference. Thus, when prices rise, perceived credibility not only stabilizes public expectations of inflation, but also becomes important information, which can be used by the individuals to improve their expectations. The econometric analysis of a large-scale survey largely confirms these theoretical predictions. The perceived policy credibility as well as inflation perceptions and education plays an important role in the individuals' inflationary expectations.

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1. Introduction

It has long been recognized that monetary policy has an inflationary bias when the policymaker makes an effort to increase growth rate (Barro & Gordon, 1983; Kydland & Prescott, 1977). The public know such possibility, but have limited information about the policymaker's preference. Thus, they can only deduce it from the past commitments and actions of the central bank. As a result, the monetary policy credibility that is perceived by the public has a strong influence on their opinions of inflation. The influence may motivate the policymaker to gain credibility since the public plays an important part in the effectiveness of monetary policy. Therefore, in a repeated game, the policymaker's choice of inflation is different than that in a one-shot game (Backus & Driffill, 1985a, 1985b; Cukierman & Liviatan, 1991; Cukierman & Meltzer, 1986; Vickers, 1986). The policymaker who has a preference for economic growth must take account of the effects of monetary policy credibility and hence choose a relatively low rate of inflation at the beginning of a repeated game.

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The above theories share the view that individuals are rational and hence able to use all the relevant information in an optimal way to make unbiased judgments of future inflation. Unfortunately, this rational expectations hypothesis is challenged by the evidence from experiments and surveys. For example, the experiment of Jacobson and Obermiller (1990) demonstrated that the individuals' inflationary expectations were affected by systematic error and did not reflect all the available information. This experiment implied expectations depended on current price and some unknown factors that produced a serially correlated error. Similarly, Simmons and Weiserbs (1992) conducted a survey and found that consumers utilized only recent inflationary perceptions for expectations. This relationship between inflationary perceptions and expectations is also supported by the studies of Carlson and Parkin (1975), Defris and Williams (1979), Jonung (1981), Wärneryd and Wahlund (1985) and Gärling and Gamble (2008). Therefore, it was proposed by Ranyard, Del Missier, Bonini, Duxbury, and Summers (2008) that a conception of bounded rationality be adopted in order to explain the results of previous studies. In addition, some of the biases in inflationary expectations may reflect the differences in the individuals' perceptions of inflation (Ranyard et al., 2008). The expectations can also be influenced by some other factors such as age, gender, personal assets and economic preferences (Jonung, 1981; Webley & Spears, 1986).

Since there are significant biases in inflationary expectations, the role of monetary policy credibility needs to be reconsidered. How does the credibility influence individuals' expectations and their accuracy? This question has not been well answered by the previous literature. With the aim of making a contribution to this topic, this paper analyzes the relationship between monetary policy credibility and inflationary expectations in the following sections. The theoretical analysis is presented in Section 2. To test the main predictions of the theoretical model, Section 3 provides an econometric analysis of a recent large-scale survey of Chinese adults. Then Section 4 concludes the paper.

2. Theoretical analysis

It is assumed that the policymaker has a strong influence on inflation via his choice of monetary policy. Suppose his preferences for policy outcomes reflect the influence of competing political pressures. According to the study of Vickers (1986), the pay-off of policymaker is given by the utility function.

$$U^{\mathrm{CB}} = \sum_{t=0}^{\infty} \rho^{\mathrm{t}} \left[-\frac{1}{2}\pi_{\mathrm{t}}^{2} + \varphi(\pi_{\mathrm{t}} - \pi_{\mathrm{t}}^{\mathrm{e}}) \right] \tag{1}$$

where ρ ($0 < \rho < 1$) is the time preference discount factor and φ ($0 < \varphi < 1$) the policymaker's preference for output and employment Thus, a higher value of φ indicates that monetary policy has a stronger inflationary bias. To maximize the pay-off, the policymaker chooses a plan of action to influence the inflation path $\{\pi t\}_{t=0}^{\infty}$. Obviously, the pay-off is also influenced by public expectations (π^{e}), which are not fully controlled by the policymaker. On one hand, a representative household's expectation (π^{e}) positively correlates with his inflationary perception (π^{P}) (Jonung, 1981; Simmons & Weiserbs, 1992; Wärneryd & Wahlund, 1985). On the other hand, the expectations can also be influenced by the policymaker since the household knows the relationship between monetary policy and inflation. Because the preference φ is private information of the policymaker, the household can only make inferences from the policymaker's past actions and their consequences.

Let H be the critical value above which φ is regarded as strong preference for economic growth. The prior probability that $\varphi < H$ is P, which is known by the household. If he or she has a low value of π^{P} or does not perceive a high rate of inflation at time t, the probability will be adjusted upward at time $t + 1$ according to the Bayesian rule, and vice versa. Consequently, the household's perception of monetary policy credibility (R) is formed ($0 \leqslant R \leqslant 1$, $\frac{\partial R_{\mathrm{t}}}{\partial \pi_{\mathrm{t}}^{\mathrm{P}}} < 0$). If the household's observation is good and hence R soundly reflects the policymaker's preference or plan of action, the adoption of R in the expectations of inflation is advantageous to the household. Thus, we suppose that, when prices rise, the household's expectation function takes the form.

$$\pi_{t+1}^{\mathrm{e}} = a\pi_{\mathrm{t}}^{\mathrm{P}} + bR_{\mathrm{t}} + \theta_{\mathrm{t}} \tag{2}$$

where a and b are the coefficients of inflationary perceptions and perceived monetary policy credibility respectively.

A higher value of perceived credibility indicates that the household thinks there is a higher probability that $\varphi < H$. Therefore, the higher value of R makes the expected inflation lower ($b < 0$). In addition, $a > 0$ because of the positive correlation between inflationary perceptions and expectations. Another symbol θ denotes the influence of other factors, such as gender, age (Jonung, 1981), personal assets, and economic preferences (Webley & Spears, 1986).

At time t, $\frac{\partial U_{\mathrm{t}}^{\mathrm{CB}}}{\partial \pi_{\mathrm{t}}^{\mathrm{e}}} = -\rho^{\mathrm{t}}\varphi < 0$ according to Eq. (1). Thus,

$$\frac{\partial U_{t+1}^{\mathrm{CB}}}{\partial R_{\mathrm{t}}} = \frac{\partial U_{t+1}^{\mathrm{CB}}}{\partial \pi_{t+1}^{\mathrm{e}}} \frac{\partial \pi_{t+1}^{\mathrm{e}}}{\partial R_{\mathrm{t}}} = -\rho^{t+1}\varphi b > 0$$

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