Overnight monetary policy in the United States: Active or interest-rate smoothing?

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ABSTRACT

This paper deals with active monetary policy and interest-rate smoothing regimes. In active monetary policy, changes in short-term interest rates are due to the exogenous actions of the central bank. Such a policy is successful only when economic agents in the money market are policy invariant in the sense that their behaviors are constant under interventions. Otherwise, an interest-rate-smoothing regime in which the central bank follows a "rule-based" policy is optimal. It was found that the coefficient of Fed funds rate in Treasury bill–Fed funds rates relationship is not policy invariant while the coefficient of the Treasury bill rate in Fed funds–Treasury bills rates relationship is policy invariant. Consequently, the optimal overnight monetary policy would be an interest-rate-smoothing process. It was found that such a policy has been followed in the United States.

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1. Introduction

Should a central bank follow an active overnight monetary policy or should it follow an interest-rate-smoothing process? By active monetary policy we mean a "discretionary" policy, where the central bank is free at any time to alter its instrument through open market operations, when central banks influence, by purchasing or selling securities, the supply of non-borrowed reserves. The initial effect of these operations is reflected in interbank rates and subsequently in other short-term interest rates. An active monetary policy may also be conducted through "open mouth operations". In this case, the central bank signals the market, directly or indirectly, its desired level of interest rate. Market participants, knowing that the central bank can and will achieve its desired level, drive the interbank rate to the level desired by monetary authorities. An effective active monetary policy, either through open market or open mouth operations, leads to a liquidity effect. An active monetary policy is a situation in which changes in short-term interest rates are due to the exogenous actions of the central bank.

In an "interest-rate-smoothing" regime, instead, the central bank's actions are endogenous. Following an economic shock that causes movements in the equilibrium interest rate, the central bank – instead of changing directly the target interest rate – attempts to offset the effect of the shock by smoothing the transition of rates to the new equilibrium. Specifically, the central bank initially engages in endogenous open market operations to temporarily prevent the overnight (interbank) rate from moving to the new equilibrium level determined by market forces. In an interest-rate-smoothing regime the central bank also moderates the movements of the overnight rate. However, the active conduct of policy also includes interest-rate smoothing, as the central bank is free to react at any time to the movements of the market.[1] Finn E. Kydland and Edward

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[1] For both active (discretionary) or interest-rate-smoothing regimes see Thornton (2004) and the references within.

C. Prescott received the 2004 Nobel prize in economics in part for showing that even well-meaning policymakers could be better off with rules. This paper illustrates that this is true for the US monetary policy because of the forward-looking behavior of market participants in the US money market. The choice between an active monetary policy or an interest-rate-smoothing approach should depend on the behavior of agents in the economy and particularly in the money market. In fact, when agents are forward looking, say, in the money market, the estimated coefficients of the relationship between short-term interest rates (e.g., Eq. (4)) may remain constant over time (temporal stability) but are not policy invariant (not stable) since the behavior of forward-looking agents will change with policy regime changes or other exogenous shocks. In such cases an active monetary policy will alter the agents' behavior, which will then undermine policy effectiveness while an interest-rate-smoothing policy can be effective.

There are at least seven explanations in the literature for why central banks may wish to follow interest-rate-smoothing operations. The first five explanations were mentioned by Gerlach-Kristen (2004). Interest-rate-smoothing operations (i) reduce the possibility of excessive reactions in the financial markets, Goodfriend (1987); (ii) facilitate the communication between the central bank and market participants, Goodfriend (1991); (iii) reduce the policy negative impact due to the central bank misperception of the state and the structure of the economy, e.g., Rudebusch (2001); (iv) help to avoid frequent policy reversals that could be interpreted as reflecting a lack of skills on the part of policymakers, Goodhart (1999); (v) are desirable because of the existence of unobserved variables and monetary policy inertia, Rudebusch (2002) and Gerlach-Kristen (2004); (vi) lead to a reduction of liquidity risk facing banks as they lower the risk of large fluctuations in the cost of servicing short-run liabilities and (vii) help the central bank to focus on the expectations of agents in the economy hence may be an optimal behavioral response on the part of central banks, e.g., Sack and Wieland (2000). Rudebusch (2002) shows that the optimal policy inertia can be achieved when private agents are forward looking. In this case because "[…] private agents know that the policy rate is likely to be adjusted by a certain amount in the future, they change their behavior today." (Rudebusch, 2002, p. 1174).

The condition of forward-looking expectations is one of the major requirements for many monetary policy recommendations. Specifically, Woodford (1999) argues that interest rate inertia reflects the attempt of the central banks to influence forward-looking expectations and Walsh (2003) finds that when agents are forward looking a speed limit targeting policy dominates inflation targeting. This paper focuses on the issue of stability as an additional explanation for following interest-rate-smoothing operations. By stability we do not mean only temporal stability; the relationship should also be policy invariant. As Lucas (1976) points out, temporal stability and policy invariance are two distinctly different concepts. The estimated parameters of a given relationship may remain constant over time, but they could still vary in response to a policy regime change or other exogenous shocks in the economy and vice versa. In such a situation, an interest-rate-smoothing policy can be more effective.[2] Thornton (2004) finds that such a policy may have been followed by the Federal Reserve (the Fed, hereafter). By influencing the overnight rate of interest, a central bank can directly affect short-term interest rates. But, since long-term interest rates are a function of short-term rates as well as expectations, a central bank can indirectly affect the long-term rates too by influencing not only short-term rates, but also expectations.

Furthermore, as Goodfriend (1991) also mentioned, output and prices do not respond to daily fluctuations in the overnight rate, but only to the variation in the longer-term interest rates. Consequently, in order for a discretionary monetary policy to successfully affect inflation and/or output gap, a stable relationship between overnight and other short-term interest rates is required. If such a stable relationship does not exist, the central bank's actions can only create a higher volatility in the money market. Note that interest-rate smoothing is desirable even if banks in the interbank market are not policy invariant. This is because under the interest-rate-smoothing policy, even if banks are forward looking in the interbank market, the central bank, in changing the target rate or influencing the effective funds rate, would only react to the movements of short-term interest rates (the economy). This reaction cannot be destabilizing. This important fact, i.e., the issue of policy invariance of market participants and the role of discretionary or rule-based policy, to the best of knowledge of the author, was not addressed in the overnight monetary policy literature.

It was found in this paper that agents in the money markets are forward looking and so their expectations are formed rationally. This implies that a discretionary monetary policy would be destabilizing in the United States and the interest-rate-smoothing process would be an optimal monetary policy. Furthermore, it was found the agents in the Fed funds market are not forward looking and so a stable and policy invariant relationship between the Fed funds rate and the 3-month Treasury bill rate exists. Section 2 provides the model and the description of the data. Section 3 is devoted to the empirical evidence. Section 4 investigates the type of monetary policy actions, which have been followed in the United States during our sample period (October 1982–December 2004). The final section provides a summary and conclusions.

2. The model and description of the data

2.1. The model

Following Sarno and Thornton (2003) and Thornton (2004), we assume that Treasury bill rates (TB) are linked to the Fed funds rate (FF). Suppose a long-run cointegration relationship between TB and FF exists and can be described as:

$$F(\text{TB}_t, \text{FF}_t, \beta) = 0, \tag{1}$$

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[2] Such a suggestion is consistent with the result found by, e.g., Woodford (1999) and Walsh (2003).