

# Monetary Policy in the U.S.

## The Federal Funds Rate Target

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### INTRODUCTION

A successful study of monetary policy must answer the following three key questions: (1) What actions did the monetary authority take? (identification of policy); (2) Why did the monetary authority take these actions? (the reaction function of the monetary authority); and (3) What effect did those actions have on the economy? (evaluation of policy).

Lack of general agreement on a structural model of the economy has focused most of recent research on monetary policy into the general direction of identified vector autoregression (VAR) analysis. The great appeal of VARs for studying monetary policy transmission is that only minimal assumptions need be imposed to separate endogenous from exogenous monetary actions. Without a complete model, movements in the economy following an endogenous policy action may be due to the policy action itself or to the variable that spurred that action. Hence the emphasis on identifying exogenous shocks.

The VAR approach typically includes either a short-term interest rate (usually the federal funds rate in the U.S.) or a monetary aggregate ( $M_1$  or  $M_2$  but more recently non-borrowed reserves or the ratio of non-borrowed reserves to total reserves) and combines it with other variables of interest – commonly, production, prices and

unemployment. The objective is to place enough restrictions in this system such that one can claim to have disentangled supply shifts from demand shifts in the reserves market through the policy variable of choice. Once supply shifts are identified, the effects of policy can be traced to the other variables in the VAR via an impulse response function analysis.

Christopher Sims (1996) summarizes into four points what this literature has discovered:

1. Most variation in monetary policy instruments is accounted for by responses of policy to the state of the economy, not by random disturbances to policy behavior.
2. Responses of real variables to monetary policy shifts are estimated as nil or modest at best.
3. Monetary policy has historically increased interest rates in response to non-policy shocks that create inflationary pressure by more than it would have under a policy of fixing the monetary stock.
4. Identification of monetary policy shifts relies on the assumption that the reaction of private sector variables to this shift is sluggish.

This assessment illustrates that we are far from answering satisfactorily to the three questions set at the onset. The validity of these studies lies in their success to separate demand driven shocks from policy induced supply innovations. This identification depends on the ability to collect instruments that will affect demand but not supply and vice versa and on placing the appropriate restrictions. How good is this identification? There really is not a good way to tell. Matters are further complicated by the technical nature of the reserves market. Even if one is successful in identifying supply shifts, the question then arises: Was this a policy action or

was it a technical shift due to float in the system, a Treasury balance or perhaps foreign currency withdrawals? In essence, the typical policy variable used in this studies is too noisy. Additional sources of concern include time invariant models that are estimated across different policy regimes and the specification of long distributed lags, at odds with the Federal Reserve's operating procedures.

Is there a better alternative to this line of research so that we can better explain how the Federal Reserve reacts and evaluate its management of monetary policy? I contend that this alternative is provided by analyzing the determinants of the federal funds rate target – an internal objective that is unilaterally set by the Chairman of the Federal Reserve in compliance with the directives agreed upon at the Federal Open Markets Committee (FOMC) meetings (approximately, once every six weeks). This target is not the outcome of the interaction between supply and demand for federal funds and it is not subject to technical fluctuations or extraneous sources of noise. Rather, it is an operational indicator of how the direction of monetary policy is mapped into the practice of daily operations. Before learning more about this variable, it is useful to describe its role in the market for reserves.

## THE FEDERAL FUNDS MARKET

In the market for federal funds (reserves), demand is primarily determined by banks' reserve requirements. Additionally, banks will also hold reserves as a precaution against liquidity needs. Active management of reserves is in a bank's best interest since reserves do not pay interest<sup>1</sup>. The Federal Reserve is the supplier of reserves. Total reserves are the sum of non-borrowed reserves plus borrowing from the discount window. The non-borrowed portion is determined primarily by open market operations, although uncontrolled market factors (such as currency withdrawals, Treasury balances, float, etc.) play a role in the very short run. The federal funds rate then,

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<sup>1</sup> Although the Federal Reserve has examined this possibility in the past.

is a volume weighted average of the "price" at which transactions of federal funds take place in this market. The discount rate is determined by the Federal Reserve below market rates. Institutions are expected to borrow from the discount window only when other sources of funds are not available in reasonable terms.

After each meeting the FOMC issues a directive to its agent, the Federal Reserve Bank of New York (FRBNY) concerning the conduct of market operations in the inter-meeting period. The directive identifies a controllable variable whose course will guide the day-to-day purchase and sale of securities by the Trading Desk of the FRBNY. A qualitative directive on the course of this variable is specified as the "principal instruction" of the directive. In 1984, a borrowing reserves operating procedure was implemented.

Under this procedure, the demand for required and excess reserves is forecasted. Provided that there is no change in the borrowing objective, movements in the demand for reserves are usually fully accommodated by changes in non-borrowed reserves. This allows the assumed level of borrowing to be realized. The operating procedure just described is depicted in Figure 1. For example, given some level of borrowed reserves, shifts in the demand of funds are accommodated by increasing the supply of funds to the point where realized demand intersects the federal funds rate target. This leaves the federal funds rate and borrowed reserves unchanged (albeit with a higher level of non-borrowed reserves). However, while the stated operating procedure was to target borrowed reserves, targeting the federal funds rate produced equivalent results. In the short term the federal funds rate fluctuates around the federal funds rate target due to several factors ranging from forecast errors in the demand for reserves to unanticipated shifts in the supply of funds.

Starting in the mid 1980's, the level of borrowed reserves clearly became an unreliable operating guide. During the 1985-1991 period, the number of failures of banks and thrift institutions exceeded that of any period since the Great Depression. This

was accompanied by an active involvement of the discount window. As a result, many banks became reluctant to turn to the window for fear of provoking market concerns about their...nancial condition. Together with the introduction of the Federal Deposit Insurance Corporation Act in 1991, targeting of borrowed reserves was abandoned in favor of targeting the federal funds rate, the already de facto operating procedure since long before the crisis. Today, after each FOMC meeting the new level for the federal funds rate target is publicly announced – a practice that started in February 4, 1994. Fortunately, the records prior to this date have become recently available.

#### IDENTIFYING MONETARY POLICY

How successful is the Federal Reserve in maintaining the effective federal funds rate close to its target? Figure 2 depicts the weekly average deviation of the effective federal funds rate from its objective since 1984. Aside from a few outliers, on average, this deviation is approximately zero with a standard deviation of 20 basis points. Deviations are rapidly eliminated, many times within one or two days. It is therefore safe to conclude that the Trading Desk successfully controls the amount of liquidity in the system in its daily operations and is able to abide to the target issued by the FOMC.

The Federal Reserve thus, conducts monetary policy by controlling short-term interest rates via targeting the federal funds rate. The target is adjusted in a manner that the Federal Reserve expects will help achieve future goals for wage and price inflation, real output, employment, exchange rates, credit market conditions and the health of the...nancial system. However, adjustment of the target is a far less dynamic process than the daily conduct of open market operations. For the period that starts in March 1984 to today, the target has been adjusted on average once every 6 weeks, sometimes as often as once a week, sometimes as seldom as once a year and beyond. Furthermore, the target is adjusted in limited amounts (generally increments of 25

basis points) at a restrained, deliberate pace, the direction of which, is seldom immediately reversed. Thus a typical policy action is implemented over the course of several weeks or even months with gradual movements in the same direction.

The implications of the dynamic behavior of the Federal Reserve in conducting monetary policy affect the core of the results that are found in the VAR literature. What we would like to measure is, for example, what determined the Federal Reserve to raise interest rates by 25 basis points at the March 1997 meeting of the FOMC and what impact did that raise have on the economy. By taking the snapshot of the economy at the time prior to the meeting one should be able to understand better what drives the Federal Reserve to change interest rates. Alternatively, when the Federal Reserve decided to maintain interest rates unchanged from September 1992 to February 1994, this was also the result of conducting policy – the Federal Reserve's response to the "credit crunch."

From an institutional point of view, the federal funds rate target offers a clear, well defined manner in which to measure monetary policy and its impact on the economy. From the statistical point of view, this is a challenging proposition: The target is changed irregularly in time and in discrete increments of 25 basis points. Thus, investigation of the exogenous component of monetary policy requires being able to model not only how much will the Federal Reserve change interest rates by but also when will that action take place.

Research by Rudebusch (1995) has already produced some interesting results. By simulating the manner in which the Federal Reserve adjusts the federal funds rate target, one can explain the varying ability of term spreads to forecast future interest rates at different horizons. The findings in the term-structure literature are consistent with the rational expectations hypothesis and reflect the manner in which the Federal Reserve operates. Hamilton and Jordà (1997) have successfully introduced a time series duration model capable of forecasting future target adjustments and capable

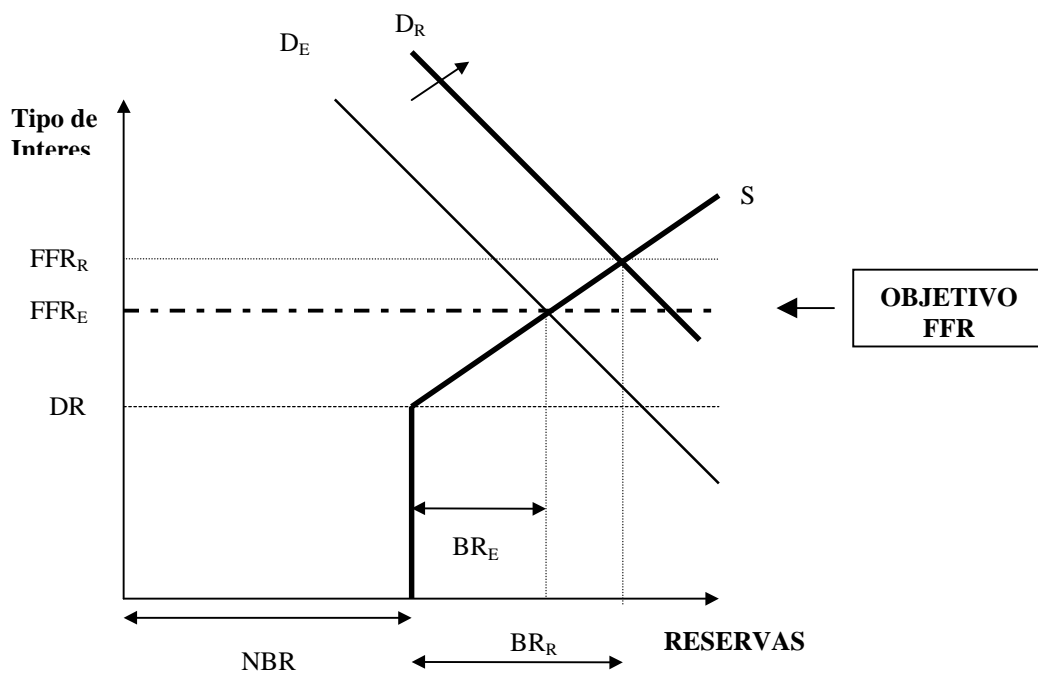
of forecasting the magnitude of such adjustments, all conditional on past information on target changes as well as other economic variables.

The federal funds rate target provides a good way to identify monetary policy. A deeper look at this variable no doubt will yield more insight into how decisions are made at the Federal Reserve. A analysis of the reaction function of the Federal Reserve and the evaluation of policy will surely follow this direction.

#### REFERENCES

- [1] Hamilton, J. D. and O. Jordà, (1997) "A Model for the Federal Funds Rate Target," University of California, Davis, manuscript
- [2] Rudebusch, G. D. (1995), "Federal Reserve Interest Rate Targeting, Rational Expectations and the Term Structure," *Journal of Monetary Economics*, April, Vol. 35, No. 2, 245-274.
- [3] Sims, C. A. (1996), "Comment on Glenn Rudebusch's 'Do Measures of Monetary Policy in a VAR Make Sense?'" Yale University, manuscript

**Figura 1. El Mercado de Reservas**



*Nota:* El subíndice E se refiere a esperado. El subíndice R se refiere a realizado

FFR = Tasa de Fondos Federales.

DR = Tasa de Descuento.

NBR = Reservas no prestadas.

BR = Reservas prestadas.

**Figura 2. Desviaciones: Tasa de Fondos Federales - Objetivo**

