

Federal Reserve Operating Strategy: Exploiting "Pressure" on Bank Reserves

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Abstract

In this study, we propose a measure of “pressure on bank reserves” that, in addition to the target federal funds rate itself, includes the spread between it and the discount rate and the spread between it and the instantaneous market rate of interest on Treasury securities. We find that these spreads help to explain the magnitudes of target funds rate changes in the years when FOMC directives were phrased in terms of desired pressure. Federal Reserve attention to all components of pressure, including the target-short rate spread, can induce stabilizing expectations on the part of the public and public responses that further Fed aims.

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I. INTRODUCTION

On January 3, 2001, Chairman Greenspan cut the target federal funds rate by 50 basis points. This cut was unusual in two respects. It did not come at a regularly scheduled Federal Open Market Committee (FOMC) meeting, making it only the third intermeeting target change in over eight years. In addition, it was the first target change in almost six years to differ from 25 basis points. In the next eight months prior to September 11, the FOMC cut the target another six times, five times by 50 basis points including one intermeeting cut. The Board of Governors cut the discount rate in pace, keeping it 50 basis points below the target funds rate. These sharp and frequent cuts are well explained by Fed concerns about economic weakness at the time. But did other factors contribute to the magnitudes of these cuts? In particular, did unusually high pressure on bank reserves make for the unusually large cuts in the funds rate target? In this contribution, we propose a measure of “pressure on bank reserves” that, in addition to the target federal funds rate itself, includes the spread between it and the discount rate and the spread between it and the instantaneous market rate of interest on Treasury securities.

I. PRESSURE AND THE FEDERAL FUNDS MARKET

The Federal Reserve's short-run intentions are reflected in the directive issued by the FOMC after each of its eight annual meetings. From early 1984 until August 1997, each directive was phrased in terms of desired "pressure" on bank reserves. In August 1997, the FOMC began to express change in its short-run policy stance in terms of a target funds rate, not reserve market pressure. By itself, this was not a major change. Since mid-1992, there had been a one-to-one correspondence between the directive's wording and at-meeting target changes. With only two exceptions, this correspondence dated from early 1989. A directive to increase pressure *slightly* translated into a 25 basis point increase in the target, *somewhat* translated into a

50 basis point increase, *significantly* translated into a 75 basis point increase. The directive also at times indicated downward or upward bias for pressure changes in the intermeeting period.

We test whether changes in the Federal Reserve's stated policy stance from early 1984 to mid-1997 were fully manifested in changes in the target federal funds rate, TFF, or whether FOMC directives acted on other, complementary measures of reserve market pressure as well. These include the spread between the target funds rate and the discount rate, TFF-DR, and the spread between the target and the short-term market rate of interest, TFF-SR, variables that appear in a model of the federal funds market developed by Ho and Saunders (1985). In this model, the spread between the funds rate and the return that banks expect on their excess reserves (SR) depends on bank risk aversion, the discount rate, and the uncertainty of bank reserve positions. The premium that banks pay for fed funds narrows when outlooks brighten and risk aversion falls.

The relationship between TFF and "pressure" is straightforward and direct. To raise the funds rate to a higher target, the Fed sells bills on the open market, reduces nonborrowed reserves and thus raises short-term rates. Higher short-rates (returns on excess reserves) increase bank demands for federal funds and raise the market-clearing funds rate. The relationship between the target funds rate-market short-rate spread, TFF-SR, and "pressure" is also direct. When banks reduce their holdings of excess reserves, whether because of increased confidence that the Fed will accommodate their future demands or because of heightened optimism and willingness to take risks, the net demand for federal funds at each market short rate declines. The market clearing funds rate falls and the funds rate-short-rate spread narrows, evidencing reduced pressure on bank reserves. This narrowing persists even if the Fed drains unwanted reserves to defend its existing target rate. Unlike the other two components of reserve market

pressure, TFF and TFF–SR, the relationship between the target funds rate–discount rate spread and “pressure” is ambiguous. The pressure on banks exerted by borrowed reserves, Goodfriend (1983) explains, increases disproportionately with bank borrowing. To the extent that a widening of TFF–DR leads banks to increase borrowed reserves as a fraction of total reserves it makes for an increase in pressure. A lower discount rate, however, reduces the burden of outstanding discount loans and decreases pressure, on net, even when TFF is steady and the TFF–DR spread widens.

DATA

Rudebusch (1995) reports the open market desk's Federal funds rate targets from September 1974 to September 1992, except for the October 1979 to February 1984 period of the monetarist experiment when no explicit targets were stated. We use annual summaries in the Federal Reserve Bank of New York *Review* and the *Wall Street Journal* website's Federal Reserve Monitor to update these targets through mid-1997 and beyond. The wording of each FOMC directive appears at the end of a meeting's minutes published with a lag in the Federal Reserve *Bulletin*.

We use the intercept of the government securities yield curve, computed for each pre-meeting and post-meeting day from March 1984 to July 1997 as proposed by Frankel and Lown (1994), to measure the short-rate (SR) that impacts the Federal funds market in our model. Since the Frankel and Lown calculation is based on logs of gross annual yields, we convert the results to 360 – day interest rates comparable to discount rates and federal funds rate targets. The interest rates on 3-month to 30-year Treasury securities to which daily yield curves are fit come from the Federal Reserve Economic Database (FRED), as do discount rates and variables in the VAR model that provides an instrument for estimating equation (2b) in Table 2.

III. RESULTS

Results for our at-meeting model are displayed in Table 1 and those for our between-meeting model are displayed in Table 2. These confirm our hypothesis that the funds rate target responds to the market short-rate and to the discount rate as well as to FOMC directives. Directive wording alone does very well in explaining target rate changes, as is seen in the first column of Table 1; the signs and relative magnitudes of directive coefficients in both models, are as expected. The discount rate and market short-rate variables add significantly to the relation, as is seen in the second column of the table. A Wald test of coefficient magnitudes confirms our hypothesis that, over the study period, at-meeting target changes responded to a composite measure of pressure, a weighting of the target–short rate spread, the target–discount rate spread, and the target’s own value.

We next turn to our between-meeting model. As indicated in the first column of Table 2, bias alone does well in explaining between-meeting target funds rate changes. Addition of the discount rate and short-rate variables, however, adds explanatory power to the intermeeting relation. Complete results for the full model, simultaneous equations (2a) and (2b), are displayed in the last two columns of Table 2. The instrument used to identify equation (2b) is end-of-period unemployment rate as fit from a simple VAR model of the macroeconomy. A Wald test of coefficient magnitudes in equation (2a) confirms our hypothesis that between-meeting target changes responded to a composite measure of pressure, a weighting of the target–short rate spread, the target–discount rate spread, and the target’s own value. In addition, as is seen in the last column of the table, change in the market short rate over the intermeeting period depends significantly on the behavior of the target funds rate over the period, as expected when these variables are simultaneously determined.

IV. CONCLUSION

Though the FOMC no longer phrased its directives in terms of “pressure on bank reserves” after its July 1997 meeting, it continued to employ the concept of pressure. At its February 2000 meeting, for example, it authorized the Chairman “to adjust somewhat in exceptional circumstances the degree of pressure on reserve positions and hence the intended federal funds rate” during an intermeeting period. On September 17, 2001, as financial markets reopened following the September 11 attacks, the TFF was lowered by 50 basis points – but *just* 50 basis points – in line with the authorization to adjust only *somewhat* and despite one of the widest TFF–SR observed since the beginning of our study period.

The Fed’s concern with pressure is welcome when the public is aware of this concern: public understanding of its objectives helps it achieve its objectives. Expectation that the Fed will raise TFF to contain a shift toward optimism reflected in a narrowed funds rate–short rate spread reinforces a stabilizing monetary regime. It reduces the public’s demand for bills, forces persistent open market purchases just to keep the funds rate from rising above its target, and signals the need for the Fed to raise TFF. The TFF–SR spread thus provides important information to both the public and the Fed in the conduct of monetary policy. A change in banker risk aversion can trigger responses by the public and the Fed that attenuate the impacts of changed sentiments on credit conditions. Unusually narrow and wide spreads signal the Fed to revise TFF, raising it to dampen optimism, lowering it to quiet fear.

Our empirical results support the Ho and Saunders model of the federal funds market that was the framework for our investigation: the magnitudes of TFF changes do reflect TFF–SR and TFF–DR spreads. More importantly, we explain how attention to the TFF–SR spread contributes to stability of an interest rate targeting operating regime.

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Table 1: Setting The Target Federal Funds Rate : At-Meeting Model

Variables	Model 1 Directives Only	Model 2 Full Model
Constant	-.022 (.033)	-.022 (.033)
TFFB	1.00*** (.005)	.933*** (.026)
DRB		-.413*** (.060)
DRA		.415*** (.059)
SRB		.074*** (.028)
DIRECTIVES		
Somewhat Down	-.364*** (.054)	-.301*** (.046)
Slightly Down	-.259*** (.037)	-.205*** (.031)
Slightly UP	.215*** (.049)	.208*** (.039)
Somewhat Up	.426*** (.049)	.278*** (.045)
Significantly Up	.765*** (.106)	.402*** (.099)
Number of observations	107	107
Adjusted R-square	.9975	.9984
Durbin Watson	2.017	1.977

Notes: Standard errors are shown in parentheses. The asterisks *, **, and ***, indicate statistical significance at the .1, .05, and .01 levels, respectively. The letter B appended to an interest rate indicates its value just before a FOMC meeting while the letter A indicates its value just after the meeting. Target rate changes that occur within three working days of a meeting's end are treated as at-meeting changes. The at-meeting period ranges from one day prior to the meeting to three days after the meeting. The test that pressure is a composite of TFF, (TFF-SR) and (TFF-DR) is straightforward (see, Malamud and Assane, 2001). Using a Wald test, there is no evidence to reject the joint hypotheses that the coefficients of TFFB and SR sum to 1 and that the coefficients of DRB and DRA are equal in absolute magnitude.

Table 2
Setting The Target Federal Funds Rate : Between-Meeting Model

Variables	Model 1	Model 2	
(Dependent variable)	(TFFB ₊₁)	(2.a)	(2.b)
		(TFFB ₊₁)	(SRB ₊₁)
Constant	.031 (.072)	-.085 (.107)	.656** (.230)
TFFA	.989*** (.011)	.837*** (.142)	-.386*** (.178)
DRA		-.426** (.206)	
DRB ₊₁		.471** (.206)	
SRA		-.357* (.193)	.616** (.089)
SRB ₊₁		.507 (.344)	
TFFB ₊₁			.700*** (.151)
Unemployment			-.065* (.032)
BIAS			
Bias Down	-.146*** (.055)	-.066*** (.030)	
Bias Up	.155*** (.053)	.084* (.043)	
Number of observations	106	106	106
Adjusted R-square	.988	.994	.981
Durbin Watson	1.85	2.19	1.89

Notes: Standard errors are shown in parentheses. The asterisks *, **, and *** indicate statistical significance at the .1, .05, and .01 levels, respectively. The letter B appended to an interest rate indicates its value just before a FOMC meeting, the letter A is its value just after the meeting, and B₊₁ is its value just before the next meeting. Target rate changes that occur after three working days of a meeting's end are treated as between-meeting changes. The intermeeting period ranges from three days after a meeting to one day before the next meeting. Using a Wald test, there is no evidence to reject the joint hypotheses that the constant term is zero, the coefficient of TFFA is one, the coefficients of DRA and DRB₊₁ are equal in absolute magnitude, and the coefficients of SRA and SRB₊₁ are equal in absolute magnitude.