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ABSTRACT

The risk premium hypothesis suggests that absolute changes in short-term interest rates will be larger if the unanticipated component of the Federal Reserve's weekly money supply announcement is positive. Statistical tests suggest, however, that the magnitude of interest rate changes are unrelated to the sign of monetary surprises.

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MICHAEL T. BELONGIA and FREDRIC KOLB

I. INTRODUCTION

A risk aversion hypothesis is one possible explanation for changes in short-term interest rates associated with the Fed's weekly money announcement. Assuming a particular Federal Reserve reaction function for controlling weekly movements in M1, it can be argued that large positive innovations in money "put pressure on the Fed to 'do something,' and this makes future policy more uncertain. ... Conversely, a negative innovation in money gives the Fed added leeway and reassures the market that no fundamental change in policy is forthcoming" [Cornell (1983), p. 648]. This view of Fed behavior, when combined with Tobin's (1958) risk aversion treatment of money demand, implies that the added risk premium associated with a large positive surprise in the weekly M1 announcement will cause an increase in short-term interest rates larger in absolute value than the decline in short rates associated with a negative innovation in money. It is this hypothesized asymmetry of interest rate responses which we investigate below.

II. TESTING THE RISK PREMIUM HYPOTHESIS

Positive versus Negative Surprises

The risk premium hypothesis can be tested directly by estimation of the following model:

$$(1) \quad \Delta TB_t = a_o + a_1\, UM_t + a_2\, (DP * UM_t) + a_3\, EM_t + \varepsilon_t$$

where: ΔTB is the change in 3-month Treasury bill rates; UM_t is the unanticipated change in M1 as measured by the difference between the first-announced estimate of M1 and the median of the Money Market Services, Inc. (MMS) survey for M1; DP is a zero/one variable set equal to one if the monetary surprise is positive and is zero otherwise; and EM_t is the expected change in M1 as measured by the MMS survey median.

The use of an interaction term in this form is intended to indicate whether a positive monetary surprise elicits a larger interest rate response than a negative innovation. For $\hat{a}_2$ significant, the interest rate response to a positive surprise would be the sum of the coefficient on unanticipated money ($\hat{a}_1$) plus the coefficient on the interaction term ($\hat{a}_2$). The significance of $\hat{a}_2$, therefore, provides some general insights on the validity of the risk premium hypothesis.

The results of estimating this model are shown in Table 1. The findings reject the risk premium hypothesis as shown by the nonsignificant t-statistic associated with $\hat{a}_2$. At this level of aggregation, in which simple distinctions are drawn between positive and negative surprises, there appears to be no differential effect on rate movements.[1/]

Testing Surprises of Different Magnitudes

The test and model described above were re-specified to draw finer distinctions among monetary innovations of different signs and magnitudes. The dummy variable, DP, was revised to group monetary surprises into five size classes of approximately $1 billion increments centered around zero. These classes are defined at the bottom of Table 2.

The results in Table 2 indicate that this further delineation of monetary innovations by sign and magnitude still rejects the risk premium hypothesis. Even though the signs on coefficients follow a somewhat different pattern than that suggested by the groupings in Table 1, none of the interaction terms is significantly different from zero. Moreover, testing the equality of pairs of coefficient indicates the absence of any significant asymmetries among rate responses to monetary surprises of different magnitudes. For example, a t-statistic of 0.53 associated with the null hypothesis $a_2 = a_5$ indicates that a relatively large positive monetary surprise elicits an interest rate response not significantly different from the response to a large negative surprise. The extended model also is consistent with the earlier finding of significant effects for both expected and unanticipated changes in money.

III. CONCLUSIONS

The risk premium hypothesis implies that the increase in interest rates precipitated by an underprediction of M1 will be larger in absolute value than the decrease in interest rates associated with a negative monetary surprise. This hypothesized asymmetry of interest rate responses would occur because a larger than expected increase in money will "put pressure on the Fed to 'do something'." The exact nature and timing of the Fed's actions, however, are unknown. This pressure for an uncertain policy response--which is not expected for a negative monetary surprise--is hypothesized to increase risk premia and produce a larger interest rate response for underpredictions of money. The empirical evidence presented, however, rejects this hypothesis.

FOOTNOTES

1/ The results in Table 1 are interesting for another reason, however. The coefficient associated with the expected change in money (a_3) is significant at the one percent level, a result in sharp contrast to the efficient markets hypothesis. In that model of asset markets, expected changes in money should not have significant effects because they are part of the information set that determines current yields and prices. Roley (1983) and Belongia and Kolb (1984) both have found expected money to be significant in models estimated over the period in which the timing of both the MMS survey and the Fed's announcement were changed. The latter conclude, however, that because such tests are joint tests of both the model's restrictions and market efficiency, it is not clear that a significant coefficient for expected money necessarily implies market inefficiency. For example, the MMS survey median could be a biased expectation.

Table 1
Tests for Simple Differences Between Positive and Negative M1 Innovations

$$\Delta TB_t = a_o + a_1 UM_t + a_2 (DP * UM_t) + a_3 EM_t + \varepsilon_t$$

a_o	a_1	a_2	a_3	$\bar{R}^2$	D-W
0.589	5.599	-0.548	-2.363	0.32	1.84
(0.30)	(4.51)	(0.30)	(2.83)		

Absolute values of t-statistics in parentheses.

Table 2
Interest Rate Responses to Monetary Surprises of Different Magnitudes 1/

$$\Delta TB = a_o + a_1 UM_t + a_2 (D1*UM_t) + a_3 (D2*UM_t) + a_4 (D3*UM_t) + a_5 (D4*UM_t) + a_6 EM_t + \varepsilon_t$$

Variable	Coefficient Estimate 2/
a_o	-0.630 (0.33)
a_1	5.339 (4.38)
a_2	-0.224 (0.13)
a_3	1.710 (0.59)
a_4	2.733 (0.70)
a_5	-2.000 (0.79)
a_6	-2.230 (2.73)
$\bar{R}^2 = 0.32$	
D-W = 1.84	

1/ D1 = 1 if UM > \$2 billion; 0 otherwise
D2 = 1 if \$1 billion < UM_t < \$2 billion; 0 otherwise
D3 = 1 if -\$2 billion < UM < -\$1 billion; 0 otherwise
D4 = if UM_t < -\$2 billion; 0 otherwise.
Base group: -\$1 billion < UM_t < \$1 billion

2/ Absolute value of t-statistics in parentheses.

REFERENCES

Belongia, Michael T., and Kolb, Fredric, 1984, "The money supply announcements puzzle: a comment," Federal Reserve Bank of St. Louis Working Paper No. 84-006.

Cornell, Bradford, 1983, "The money supply announcements puzzle: review and interpretation," American Economic Review, 73-4, 644-57.

Roley, V. Vance, 1983, "The response of short-term interest rates to weekly money announcements," Journal of Money, Credit and Banking, 15-3, 344-54.

Tobin, James, 1958, "Liquidity preference as behavior towards risk," Review of Economic Studies, 25-1, 65-86.