The Effect of the Two Different Monetary Base Measures on Financial Markets

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This paper examines the effect of unexpected monetary base announcements on short-term interest rates for both the Board of Governors' monetary base measure and the monetary base measure of the Federal Reserve Bank of St. Louis. We find evidence, for the decade of the 1980s, suggesting that the two announcements for any period are substantially different from each other. Yet, no evidence is found of significant monetary base announcement effects on short-term interest rates. Our evidence suggests that financial markets do not consider the information in these monetary base announcements to be particularly newsworthy, in the face of M1 announcements.

INTRODUCTION

Cornell (1983 b) argues that if unexpected M1 announcements carry information to financial markets, then unexpected monetary base announcements, which generally have a one week shorter publication lag, also should carry information to financial markets. Hein (1987), however, argues that the effect of lagged reserve accounting more than offsets the shorter publication lag and expects little information content from base announcements under such a system. Huizinga and Leiderman (1987) do not emphasize the publication lag, but argue that unexpected monetary base announcements should affect interest rates because base announcements provide a significant signal for subsequent changes in monetary aggregates.

There have been a number of studies (Cornell, 1983 a, b; Hein, 1987; Huizinga and Leiderman, 1987; and Joines, 1989) that have examined the effect of unexpected monetary base announcements on short-term interest rates. These studies provide conflicting evidence about the importance of monetary base announcements. Much of the research concludes that base announcements are not important in affecting short-term rates, but one study (Huizinga and Leiderman, 1987) concludes these announcements did, at one time (October 1979 to October 1982), carry important information to financial markets.

The influence of monetary base announcement effects may be complicated by the fact that there are two measures of the monetary base released within the Federal Reserve System: one measure is released by the Board of Governors of the Federal Reserve System, and the other measure is released by the Federal Reserve Bank of St. Louis. The main difference between these two measures is the procedure employed to calculate the reserve adjustment magnitude (RAM), which accounts for changes in reserve requirements

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by the Federal Reserve. (See Gilbert, 1983; and Garfinkel and Thornton, 1991 for a description of both measures.)

Haslag and Hein (1990) show that the two different base measures bear a statistically different association with nominal GNP growth. Garfinkel and Thornton (1991) also provide evidence that the two measures can differ significantly. Given this evidence, we note that the prior monetary base announcement studies have chosen to use one monetary base measure or the other. Three of these studies (Cornell, 1983 a, b; Hein, 1987) use the St. Louis adjusted monetary base, while the other two (Huizinga and Leiderman, 1987; Joines, 1989)]use the Board monetary base adjusted for reserve requirement ratio changes. It is possible that the conflicting evidence that has been reported is due to the use of one measure as opposed to the other. The purpose of this paper is to examine the effect of both of the weekly monetary base measures on short-term rates, investigating whether short-term interest rates change in response to news in either monetary base announcement. The period of analysis also includes the recent contemporaneous reserve accounting period to see if the change in reserve accounting procedures has altered the information content of base announcements.

METHODOLOGY

During the early 1980s, when the Federal Reserve emphasized M1 targeting, it has been estimated that an unexpected change of $1 billion in M1 led to a three-to-ten basis-point increase in short-term yields. (See Deaves, Melino, and Pesando, 1987; and Urich and Wachtel, 1984.) The response of asset yields to M1 announcements declined significantly after the de-emphasis of M1 targets in 1983. The significance of monetary base announcements can be investigated through the use of regression analysis similar to that employed in weekly money announcement studies. The general model used here and by earlier studies is given by the following equation:

$$(1)\ \Delta R_{t+1} = B_0 + B_1\, EM1_t + B_2\, UM1_t + B_3\, EMB_t + B_4\, UMB_t + e_t,$$

where:

ΔR_{t+1}	=	The change in market interest rates from the time of the weekly monetary aggregate announcement at time t, to one period later;
$EM1_t$	=	The expectation of M1, the money stock announcement (in terms of week to week changes) made at time t;
$UM1_t$	=	The unexpected change in M1 announced at time t;
EMB_t	=	The expected weekly change in the monetary base, based on information available immediately prior to the announcement;
UMB_t	=	The unexpected change in the monetary base announcement; and
e_t	=	A random error term that reflects other unknown factors that cause interest rates to change from time t to t+1.

Market efficiency implies that B_1, $B_3 = 0$. That is, the market should assimilate all relevant information into the preannouncement structure of interest rates so that interest

rates do not react to the anticipated part of the announcement once it is confined.[1] If monetary base announcements signal new information to financial markets (either because this information is published before M1 (Cornell, 1983b) or because the base announcement provides information about future M1 growth (Huizinga and Leiderman, 1987), B_4 should be significantly different from zero, indicating that surprises in the base measure have important effects on interest rates. In particular, the arguments of Cornell and Huizinga and Leiderman suggest interest rates will rise following unexpected increases in the monetary base, i.e., $B_4 > 0$.[2] Similarly, B_2 also should be positive and significantly different from zero based on the traditional monetary transmission mechanism (Urich and Wachtel, 1984).

Because there are two different monetary base announcements (following the separate estimation of equation (1) for each base measure individually), we estimate a more general model, with both announcement effects considered simultaneously:

$$(2)\ \Delta R_{t+1} = B_0 + B_1\, EM1_t + B_2\, UM1_t + B_3\, EBGB_t + B_4\, UBGB_t + B_5\, ESLB_t + B_6\, USLB_t + e'_t,$$

where:

EBGB = The expected change in the Board base;
UBGB = The unexpected change in the Board base;
ESLB = The expected change in the St. Louis base;
USLB = The unexpected change in the St. Louis base; and the other variables are as defined above.

Again, if the monetary base announcements carry important information to financial markets as suggested by Cornell and Huizinga and Leiderman, then we expect $B_4 > 0$ and $B_6 > 0$.

Finally, the question of whether or not there is a significant difference in the two respective announcements can be addressed by estimating,

$$(3)\ \Delta R_{t+1} = B_0 + B_1\, EM1_t + B_2\, UM1_t + B_3\, EDIFB_t + B_4\, UDIFB_t + e''_t,$$

where:

EDIFB = The difference in the expected change in the two base announcements (EBGB - ESLB);

[1] Some studies, however, report a significant effect on interest rates associated with the expected change in money. (See Deaves, Melino, and Pesando, 1987; and Hein, 1987.)

[2] Cornell (1983) suggests that weekly monetary base announcements should provide significant information to financial markets in addition to the weekly information contained in the M1 announcement. Cornell argues that if financial markets are concerned about future inflation, the monetary base should be monitored closely. For example, an unexpected increase in the monetary base is expected to increase interest rates, as market participants anticipate higher future inflation.

UDIFB = The difference in the two respective shocks (UBGB - USLB); and the other variables remain as defined above.

Here, a coefficient estimate, B_4, which is different from zero suggests that the market does not consider each base announcement to be equivalent. If, for example the St. Louis measure is a more meaningful measure (as Haslag and Hein (1990) find, although their evidence refers to the effect of base measures on nominal GNP, not interest rates), one would expect $B_4 < 0$.[3]

SAMPLE PERIODS AND DATA

To be consistent with previous research (Joines, 1989), we break the sample period, January 1980 to October 1989, into four subperiods. We examine four subperiods:

- January 1980 to October 1982;[4]
- October 1982 to February 1984;
- February 1984 to December 1986; and
- January 1987 to October 1989.

We select the October 1982 break because the Federal Reserve announced then that it was ending the nonborrowed reserve targeting procedure. From October 1979 through October 1982, the Federal Reserve System attempted to control M1 behavior through a means of targeting bank reserves, excluding those borrowed at the discount window. This procedure placed the role of reserves (and thus the base) in a critical position relative to the control system in place after 1982. The February 1984 break coincides with the move from lagged to contemporaneous reserve accounting (CRA). Hein (1987) emphasizes that the information content of reserves (and thus the monetary base) is mitigated by the lagged reserve accounting system in place prior to February 1984. Under this accounting system, deposits this week determine the amount of required reserves two weeks hence. Thus, deposits will lead reserves and the base. But the move to CRA should eliminate this occurrence, as deposits this week determine required reserves this same week. Finally, we select the December 1986 break because the Federal Reserve discontinued the practice of establishing M1 targets about this time. With the Fed no longer targeting M1, financial markets may discount the information content of M1 and monetary base announcements, as meaningless information.

INTEREST RATES

As in other base announcement investigations, the measure for market interest rates is the three-month Treasury bill rate (ΔTB). Interest rates are sampled just before the announcement, the day the Federal Reserve releases the aggregates (Thursday or Friday at 4:15 p.m.) and again the next business day. We obtained the Treasury bill rate informa-

[3] The St. Louis base measure may be more meaningful than the Board of Governors base measure because the base period selected by the St. Louis Bank generally reflects average reserve requirement ratios over the sample period, rather than just current reserve requirement ratios.

[4] The Board of Governors and the Federal Reserve Bank of St. Louis started to release the base information at the same time on March 28, 1980.

tion from the Federal Reserve's H.15 release, a weekly statistical release that details daily interest rate data.[5]

MONETARY BASE DATA

BOARD DATA

For the early part of our sample, weekly monetary base figures from the Board of Governors were taken from the Federal Reserve's H.9 release; for all of our sample, this measure also is reported in the Federal Reserve's H.3 release. During this early period, the H.9 release was made available by the Federal Reserve the day of the announcement (generally Friday), while the H.3 release was made public the following business day (generally Monday). We examine the H.9 announcement, as it represents the first public announcement. In February 1984 the Federal Reserve discontinued the publication of the H.9 release, as a two week contemporaneous reserve accounting system was adopted, and the Board started a biweekly announcement of the monetary base measures.

ST. LOUIS DATA

The Federal Reserve Bank of St. Louis releases its own monetary base measure, referred to as the *adjusted monetary base*, through the weekly publication *U.S. Financial Data*. On the day of the announcement, generally Fridays from 1980 to 1982 and Thursdays after 1982, the St. Louis Bank provides the information on the latest base measure over the phone. The Bank also mails the publication to approximately 50,000 subscribers.[6]

A COMPARISON OF THE TWO BASE ANNOUNCEMENTS

Table 1 provides some evidence quantifying the difference in the two measures by comparing the simultaneously announced week-to-week change in the two measures. We make this comparison for each of the four subperiods. The paired t-tests on the difference of the means of the weekly change in the two base measures (ΔBGB is the weekly change in the Board's base, and ΔSLB is the weekly change in the St. Louis' base.) reveal that the mean week-to-week changes in the two measures are significantly different only during the third subperiod, February 1984 to December 1986 (Table 1). The nonparametric test, the Wilcoxon signed rank sum test, also confirms this result, as it suggests different distributions only for the third subperiod. On the other hand, an F-test reveals that the two base measures have unequal variances during all four subperiods (Table 1). Thus, the data reject the hypothesis that the week-to-week changes in the two measures come from

[5] Mercado-Mendez (1989) examines interest rates sampled over a shorter window of time: 3:30 p.m. to 5:00 p.m. He finds that this window does not allow sufficient time for the market to react to St. Louis base announcements. Thus, the larger window of time (day to day closing rates) is considered in this paper.

[6] Even though the Federal Reserve System adopted a two week contemporaneous reserve requirement system in February 1984, the St. Louis Bank continued to release the weekly figures for the adjusted monetary base through February 1986. The St. Louis bank started to release the base measure biweekly on February 13, 1986.

Table 1—Statistical Analysis of the Difference in the Two Announced Base Changes (Week-to-week change in the Board's base, ΔBGB; week-to-week change in the St. Louis' base, ΔSLB)

	Number of Observations	Mean	Standard Error	T-statistic	Prob > |T|
Panel A January 1980-October 1982					
	144	-0.00277	0.07986	-0.03478	0.9723
(Wilcoxon Signed Rank Sum Test: Sign Rank = -118.5 P > |S| = 0.791) Ho: Variances are equal, F = 1.37 Prob > F = 0.0581					
Panel B October 1982-February 1984					
	69	-0.08985	0.09591	-0.93684	0.3522
(Wilcoxon Signed Rank Sum Test: Sign Rank = -64 P > |S| = 0.672) Ho: Variances are equal, F = 1.82* Prob > F = 0.0143					
Panel C February 1984-December 1986					
	75	0.53600	0.24203	2.21452	0.0299
(Wilcoxon Signed Rank Sum Test: Sign Rank = 365 P > |S| = 0.039) Ho: Variances are equal, F = 4.97* Prob > F = 0.0000					
Panel D January 1986-October 1989					
	74	0.24324	0.16737	1.45324	0.1504
(Wilcoxon Signed Rank Sum Test: Sign Rank = 214 P > |S|=0.212) Ho: Variances are equal, F = 1.72* Prob > F = 0.0213					

*Indicates statistical significance at the 5 percent level. See Appendix 1 for definition of variables

the same distribution, reinforcing Garfinkel and Thornton's point that the two series are different from one another.

M1 DATA

We obtained money stock announcement data from the *U.S. Financial Data* release. Unlike the monetary base announcements, the St. Louis M1 announcement is the same as that of the Board of Governors.

MEASURES OF INNOVATIONS

To examine the effect of monetary base announcements on interest rates, we must obtain the expected and unexpected elements from the actual announcements. Survey forecasts and time series models have been used by previous studies to measure the anticipated and unanticipated money announcement changes. Because the survey forecasts are available only for M1 announcements (from Money Market Services International, MMS), we are restricted in our investigation, as are the earlier monetary base announcement studies, to the time series approach for decomposing monetary base announcements into expected and unexpected parts.

The unexpected change in the base announcement (UMB in equation (1)) at time t is modeled by residuals from a time series (ARIMA) model for the respective weekly change of the announced variable. The forecasts (fitted values) of the ARIMA model are taken as

measures of the expected change, EMB from equation (1). These are not perfect measures, as they incorporate information in subsequent base announcements (required in the estimation process) that would not have been available to a forecaster at the time. Still, such a methodology seems appropriate as previous studies (e.g., Cornell, 1983 a, b; Hein, 1987; Huizinga and Leiderman, 1987; and Joines, 1989) have shown that the unexpected part of various announcements have significant information content, while the expected part doesn't. Thus, the decomposition of any announcement has disentangled the shock information from the expected element of the announcement in earlier studies.

BOARD OF GOVERNORS' BASE ANNOUNCEMENTS

Table 2 shows the coefficient estimates and summary statistics for the different ARIMA models for the weekly change in the Board's base (ΔBGB). The Ljung-Box Q statistic for the model residuals does not allow rejection of the white noise hypothesis. The values of the autoregressive parameters for the ΔBGB model confirm that each coefficient is significantly different from zero.

Table 2—Time Series Model Estimates for the Board's Base Announcements (Changes in the Board's Base: ΔBGB)

	Mean $_{\Delta BGB}$	Standard Deviation $_{\Delta BGB}$	Q-Statistic	Number of Weekly Observations
Panel A January 4, 1980-October 1, 1982				
	0.174	0.839	$X^2_{14} = 9.32$	144
$(1 + 0.467^{*}B + 0.195^{*}B^2 + 0.329^{*}B^3 - 0.373^{*}B^9)\Delta BGB = 0.173^{*} + u_t$ (0.070) (0.0771) (0.0711) (0.0653) (0.0323)				
Panel B October 8, 1982-February 10, 1984				
	0.226	0.722	$X^2_{16} = 11.93$	70
$(1 + 0.374^{*}B)(1 - 0.583^{*}B^4)\Delta BGB = u_t$ (0.1129) (0.1001)				
Panel C February 16, 1984-December 18, 1986				
	1.003	0.854	$X^2_{17} = 21.98$	75 (biweekly)
$(1 - 0.428^{*}B^2)\Delta BGB = 0.972^{*} + u_t$ (0.1065) (0.1542)				
Panel D January 1, 1987-October 19, 1989				
	0.827	1.123	$X^2_{18} = 18.53$	74 (biweekly)
$\Delta BGB = 0.827^{*} u_t$ (0.1272)				

Numbers in parentheses are standard errors of the estimate
* Statistically significant at the 5 percent level. Variables are defined in Appendix 1

There is a noticeable difference in the time series behavior of the Board's base over the four subperiods considered. For example, the model for the first subperiod is a complex AR (1,2,3,9) model. The models for the other subperiods are of the form: AR(1)(4) for the subperiod October 1982 to February 1984, and AR(2) for the subperiod February 1984 to December 1986. We estimated a simple mean model for the last subperiod, January 1987 to October 1989.[7]

ST. LOUIS' BASE ANNOUNCEMENTS

Table 3 shows the coefficient estimates and summary statistics for the weekly change in the St. Louis base (ΔSLB) time series models. The Ljung-Box Q-statistic for the model residuals does not allow rejection of the white noise hypothesis at traditional (5%) levels. Again, there is some variation in the time series behavior of this base measure across time. While the model for the first, second, and fourth subperiods is of the form AR(1), the model for the third subperiod is of the form AR(1,2,3,9,13).

Table 3—Time Series Model Estimates for the St. Louis' Base Announcement (Changes in the St. Louis' Base: ΔSLB)

	Mean $_{\Delta SLB}$	Standard Deviation $_{\Delta SLB}$	Q-Statistic	Number of Weekly Observations
Panel A January 4, 1980-October 1, 1982				
	0.177	0.715	$X^2_{17} = 10.95$	144
$(1 + 0.402^{*}B)\Delta SLB = 0.179^{*} + u_t$ (0.0776) (0.0393)				
Panel B October 8, 1982-February 10, 1984				
	0.334	0.549	$X^2_{17} = 14.43$	70
$(1 + 0.450^{*}B)\Delta SLB = 0.328^{*} + u_t$ (0.1121) (0.0415)				
Panel C February 16,1984-December 18,1986				
	0.424	1.938	$X^2_{13} = 17.75$	127
$(1 + 0.459^{*}B + 0.319^{*}B^2 + 0.275^{*}B^3 - 0.284^{*}B^9 - 0.188^{*}B^{13})\Delta SLB = 0.437^{*} + u_t$ (0.0774) (0.0848) (0.0830) (0.0758) (0.0786) (0.0814)				
Panel D January 1, 1987-October 19, 1989				
	0.556	1.494	$X^2_{17} = 14.06$	74 (biweekly)
$(1 + 0.481^{*}B)\Delta SLB = 0.540^{*} + u_t$ (0.1008) (0.1014)				

Numbers in parentheses are standard errors of the estimate
* Statistically significant at the 5 percent level. Variables are defined in Appendix 1

[7] In this last case, the expected element (forecast) of the base announcement is given by the mean of the series. The unexpected element (residual) is equal to the change in the base series minus the mean of the series.

Tables 2 and 3 reveal important differences between the two base measures. For example, during the first two subperiods, January 1980 to October 1982 and October 1982 to February 1984, the base measure released by the Board of Governors shows a larger variability in weekly changes than the St. Louis' measure. The standard deviation for the St. Louis' base weekly change is 0.715 for January 1980 to October 1982 and 0.549 for October 1982 to February 1984, while the standard deviations for the Board's base weekly change are 0.839 and 0.722, respectively. This larger variability of the Board's base also is reflected in the estimation of the time series models. During the first two subperiods, we generally identify and estimate more complex models for the change in the Board's base than for the change in the St. Louis' base. During the later two subperiods, February 1984 to December 1986 and January 1987 to October 1989, however, the opposite situation occurs. The St. Louis' base exhibits a larger variance (1.938 and 1.494 for the St. Louis' base compared to 0.854 and 1.123 for the Board's base, respectively), and we estimate simpler models for the change in the base released by the Board of Governors (Tables 2 and 3).

EVIDENCE ON THE INTEREST RATE RESPONSE TO MONETARY BASE ANNOUNCEMENTS

Tables 4 and 5 present the regression results in which we regress the change in the three month Treasury bill rate against the expected and unexpected parts of the announcements for the four different subperiods. Table 4 examines the pre-CRA periods, and Table 5 considers the CRA periods. For the various subperiods, regression (1) considers announcements provided by the Board of Governors. Regression (2) uses the adjusted monetary base from the St. Louis Bank. Regression (3) includes announcements of both base measures simultaneously, and regression (4) includes the difference between the two base measures as independent variables to test for different responses. In the first subperiod, we measure the change in the interest rate (ΔTB) as the Monday closing rate less the Friday closing rate (ignoring holidays). For the other subperiods, we measure the change in the interest rate as the Friday closing rate less the Thursday closing rate (ignoring holidays).

The findings concerning the role of the weekly money supply announcements are consistent with the findings of others:

- Unexpected M1 increases cause large, positive interest rates reactions through 1982;
- The impact of M1 shocks on interest rates lessens after 1982 and disappears statistically after 1984; and
- The expected M1 announcement unexpectedly is related to the post-announcement change in interest rates in the first subperiod.

For the first subperiod, the results in Table 4 show that the monetary base measure released by the Board of Governors does not convey significant information to financial markets. Interest rates do not respond to unexpected Board of Governors base announcements. This finding conflicts with Huizinga and Leiderman (1987), but is similar to Joines' (1989) evidence. Joines (1989) also fails to find any significant effect for Board base announcements. Joines examines the source of conflict between his study and the

Table 4—Interest Rate Response to Monetary Base Announcements, Pre-CRA Period, OLS Estimates

$\Delta TB = a_0 + a_1 \Delta EM1 + a_2 \Delta UM1 + a_3 \Delta EBGB + a_4 \Delta UBGB + a_5 \Delta ESLB + a_6 \Delta USLB + a_7 \Delta EDIFB + a_8 \Delta UDIFB + e$

Coefficient Estimates (standard error in parentheses)										
a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	Observations	R^2
January 1980-October 1982										
0.0399	-0.0590**	0.0715**	-0.0094	0.0169					144	.22
(0.0293)	(0.0200)	(0.0118)	(0.0499)	(0.0436)						
0.0520	-0.0561**	0.0688**			-0.0763	0.0635			144	.23
(0.0335)	(0.0199)	(0.0121)			(0.0998)	(0.0415)				
0.0546	-0.0561**	0.0686**	-0.0149	0.0136	-0.0764	0.0638			144	.22
(0.0345)	(0.0202)	(0.0122)	(0.0505)	(0.0440)	(0.1017)	(0.0424)				
Test: $B_4\Delta UBGB - B_6\Delta USLB = 0$ F-value: 0.608										
0.0386	-0.0589**	0.0712**					0.0024	-0.0277	144	.22
(0.0276)	(0.0196)	(0.0116)					(0.0472)	(0.0321)		
October 1982-February 1984										
0.0175	-0.0135	0.0366**	-0.0097	-0.0128					70	.28
(0.0151)	(0.0088)	(0.0067)	(0.0259)	(0.0244)						
0.0049	-0.0099	0.0366**			0.0229	-0.0424			70	.31
(0.0243)	(0.0082)	(0.0064)			(0.0547)	(0.0247)				
0.0060	-0.0109	0.0375**	-0.0153	-0.0043	0.0269	-0.0433			70	.29
(0.0247)	(0.0090)	(0.0067)	(0.0260)	(0.0258)	(0.0569)	(0.0263)				
Test: $B_4\Delta UBGB - B_6\Delta USLB = 0$ F-value: 0.884										
0.0068	-0.0081	0.0368**					-0.0089	0.0193	70	.29
(0.0155)	(0.0084)	(0.0067)					(0.0238)	(0.0206)		

* Statistically significant at the 5 percent level
** Statistically significant at the 1 percent level
R^2 is the adjusted R^2. See Appendix 1 for a definition of variables

Table 5—Interest Rate Response to Monetary Base Announcements, CRA Period, OLS Estimates

$$\Delta TB = a_0 + a_1 \Delta EM1 + a_2 \Delta UM1 + a_3 \Delta EBGB + a_4 \Delta UBGB + a_5 \Delta ESLB + a_6 \Delta USLB + a_7 \Delta EDIFB + a_8 \Delta UDIFB + e$$

Coefficient Estimates (standard error in parentheses)

a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	Observations	R^2
February 1984-December 1986										
0.0388 (0.0290)	-0.0011 (0.0065)	0.0017 (0.0064)	-0.0387 (0.0279)	0.0074 (0.0143)					75	-.02
-0.0033 (0.0085)	-0.0046 (0.0049)	0.0036 (0.0044)			0.0116* (0.0058)	-0.0028 (0.0054)			127	.01
0.0271 (0.0302)	0.0001 (0.0068)	0.0002 (0.0065)	-0.0314 (0.0286)	0.0112 (0.0154)	0.0117 (0.0085)	0.0029 (0.0076)				75 -.02
Test: $B_4\Delta UBGB - B_6\Delta USLB = 0$ F-value: 0.189										
0.0092 (0.0121)	-0.0010 (0.0067) (0.0074)	0.0021 (0.0058)						-0.0127	-0.0006	75 -.01 (0.0074)
January 1987-October 1989										
0.0130 (0.0097)	-0.0017 (0.0042)	0.0050 (0.0033)		-0.0080 (0.0098)					74	.00
0.0160 (0.0119)	-0.0028 (0.0041)	0.0032 (0.0030)			-0.0038 (0.0126)	0.0028 (0.0071)			74	-.03
0.0144 (0.0120)	-0.0015 (0.0043)	0.0049 (0.0034)		-0.0116 (0.0109)	-0.0036 (0.0126)	0.0062 (0.0077)			74	-.03
Test: $B_4\Delta UBGB - B_6USLB = 0$ F-value: 1.284										
0.0119 (0.0103)	-0.0020 (0.0041)	0.0040 (0.0029)					0.0035 (0.0125)	-0.0075 (0.0073)	74	-.01

* Statistically significant at the 5 percent level
R^2 is the adjusted R^2. See Appendix 1 for a definition of variables

Huizinga-Leiderman study. He attributes the difference in Huizinga and Leiderman's results to a misspecified univariate model measuring the unexpected component of the Board's announcement. Our univariate model of the Board measure is an expanded version of the univariate model of Huizinga and Leiderman. They allow only for lagged base effects for one, two and three weeks earlier. As Table 2 indicates, we find it necessary to include the ninth lag of the base change to achieve white noise residuals. Table 2 indicates that excluding such a variable is not supported by the data. Thus, we concur with Joines' conclusion that Huizinga and Leiderman's evidence of significant base announcement effects is difficult to interpret. We also find that news in the St. Louis' base has no direct effect on nominal interest rates in the first subperiod. Also, differences in the two weekly announcements carry no information to financial markets. The F-test, $B_4\Delta UBGB-B_6\Delta USLB$, in equation (3) indicates that the alternative measures of the monetary base do not seem to have a different effect on interest rates during this period of time.[8]

During the second subperiod (Table 4), innovations in the Board's base and the St. Louis' base again do not affect interest rates.[9] Again, the two base measures do not seem to have a different effect on short-term rates as indicated by the F-test in equation (3) and the difference variables in equation (4).

During the last two subperiods (Table 5), interest rates do not respond to innovations in either the Board's base or the St. Louis' base. Even money stock innovations, which are important in explaining interest rates movements during the two early subperiods, do not affect interest rates for these later subperiods. Even though the paired t-test on the difference of the means of the two base measures is significant, for the subperiod February 1984 to December 1986, the F-test in regression equation (3) does not indicate a significant different effect of the base measures on interest rates.

CONCLUSIONS

This paper examines the effect of unexpected monetary base announcements on short-term interest rates from January 1980 to October 1989. The primary contribution of this paper is to examine, simultaneously, the Board of Governors' monetary base measure and the monetary base measure of the Federal Reserve Bank of St. Louis. Early studies of the base announcement effects use either the Board measure or the St. Louis Bank measure. Because these studies reach conflicting conclusions, this paper simultaneously examines the impact of both measures on short-term nominal interest rates. We find evidence suggesting that, for any one week (or two week period today with contemporaneous reserve

[8] Because we include two proxies of the same policy variable in equation (2), we test for multicollinearity by calculating the variance inflation factors (VIFs). The variance inflation factors are all close to one, suggesting the absence of serious multicollinearity. The variance inflation factors are computed as VIF = 1/(1-q), where q is the correlation coefficient obtained from regressing independent variable, q, on all the remaining independent variables in the model.

[9] The coefficient estimate for St. Louis's innovation is significantly different from zero and is negative only at the 10 percent level, which may indicate a spurious result.

accounting), the two announcements are substantially different from each other. Yet, we find no evidence, in the case of either measure individually or both measures considered jointly, of a significant monetary base announcement effect on short-term Treasury security yields.

Our evidence is consistent with the belief that the market for short-term Treasury instruments has not considered these monetary base announcements to be particularly newsworthy, in the face of M1 announcements. This conclusion is robust to the operating procedures of the Fed, the reserve accounting system in place, and the emphasis placed on M1. One reason for the lack of an effect, as emphasized by Hein (1987), may be the fact that the monetary base largely comprises currency in the hands of the public. The Federal Reserve never has targeted, nor even tried to constrain, currency growth. As such, monetary base developments may be considered relatively unimportant to the Fed and, thus, to financial markets.

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Appendix 1—Variables Used in the Regression Equations and Data Sources

ΔTB	=	Change in the three-month T-bill rate (Federal Reserve's H.15 release)
ΔBGB	=	Week-to-week change in the Board of Governors' base (Federal Reserve's H.9 and H.3 releases)
ΔEBGB	=	Expected change in the Board of Governors' base (ΔBGB - μ from Table 2)
ΔUBGB	=	Unexpected change in the Board of Governors' base (μ from Table 2)
ΔSLB	=	Week-to-week change in the St. Louis' base (Federal Reserve Bank of St. Louis' U.S. Financial Data)
ΔESLB	=	Expected change in the St. Louis' base (ΔSLB - μ from Table 3)
ΔUSLB	=	Unexpected change in the St. Louis' base (μ from Table 3)
ΔEM1	=	Expected change in M1 (survey median from Money Market Services International)
ΔUM1	=	Unexpected change in M1 (actual announced change - survey median. Federal Reserve Bank of St. Louis' U.S. Financial Data)
ΔEDIFB	=	Expected change in the Board's base - expected change in the St. Louis' base
ΔUDIFB	=	Unexpected change in the Board's base - unexpected change in the St. Louis' base