

NORTH AMERICAN MONEY SURPRISES AND FINANCIAL MARKET REACTIONS: An Empirical Note

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In the late 1970s, U.S. and Canadian weekly money supply announcements occurred almost simultaneously. The unanticipated components of these announcements are shown to be correlated, and the importance of this factor for findings in the money surprise-market response literature is explored.

Numerous researchers have investigated reactions of U.S. interest rates and foreign exchange rates to the unanticipated component of the weekly money supply announcement of the Federal Reserve. It is common to interpret such empirical results as revealing market perceptions of Federal Reserve behavior and credibility.¹ Deaves (1988) has performed a similar exercise using Canadian data and concluded that in the late 1970s market participants expected the Bank of Canada to counteract Canadian money surprises.²

Other non-U.S. money supply announcements and the financial market reactions induced by them have been examined previously,³ but the Canadian announcement presents a unique opportunity. Up until February 1980, Canadian and U.S. announcements, both weekly, occurred late Thursday afternoons. The U.S. release came out at about 4:10 PM (before the close of markets), while the Canadian figures were made public at 5:00 PM. Given the high degree of integration between the Canadian and U.S. economies and capital markets, there might be reason to expect that these money demand shocks are to some extent continent-wide:⁴ that is to say, some correlation between unexpected week-to-week changes in the U.S. and Canadian money supplies should not be surprising. This supposition is first investigated.

¹ See Sheehan (1985) for a review of the literature. To generalize, currency appreciation in response to money surprises is seen to reveal a counteractive policy, while depreciation indicates accommodation. Interest-rate movements, which have always been positively correlated with positive surprises, are ambiguous since real and nominal effects are confounded, but if these reactions extend to the more distant maturities, an arguably stronger case can be made for market nervousness about eventual accommodation. The debate in the U.S. is as yet still unresolved, since it is difficult to come up with a scenario that neatly fits everything that is observed.

² I found that during 1978-79 the Canadian dollar tended to appreciate in response to money surprises, while Canadian money and bond markets were unaffected. I argued that this finding short-term interest rates should not be surprising in a small open economy, though it would be so in a large dominant economy (like the U.S.) where a positive correlation between movements in short-term interest rates and money surprises has always been the principal finding in the literature.

³ See, for example, Goodhart and Smith (1986, 1987) on U.K. Monetary announcements, and Royle and Ito (1987) on Japanese.

⁴ It is important to note that these surprises are shocks to the money multiplier since, for both the U.S. and Canada, the level of the corresponding monetary base was announced the previous week.

Table 1
Simple correlations between week-to-week monetary changes in the U.S. and Canada. ^a

	<i>DMUS</i>	<i>EMUS</i>	<i>UMUS</i>	<i>DMCN</i>	<i>EMCN</i>	<i>UMCN</i>
<i>DMUS</i>	1.00					
<i>EMUS</i>	0.69	1.00				
<i>UMUS</i>	0.73	0.00	1.00			
<i>DMCN</i>	0.08	-0.01	0.12	1.00		
<i>EMCN</i>	0.05	0.08	0.00	0.80	1.00	
<i>UMCN</i>	0.06	-0.12	0.19	0.60	0.00	1.00

^a *DMUS*, *DMCN* = percentage week-to-week changes in U.S. and Canadian narrow money supplies, respectively; *EMUS*, *EMCN* = percentage expected changes in U.S. and Canadian money supplies; *UMUS*, *UMCN* = percentage unexpected changes in U.S. and Canadian money supplies. For details on the decomposition of U.S. and Canadian monetary changes into expected and unexpected components, see text.

Second, if it were to come to light that there was a substantial correlation between Canadian and U.S. money surprises, then all results simply focussing on one announcement or the other would be suspect due to the omitted variables problem. ⁵ In order to investigate the practical importance of this issue, it is straightforward to compare estimated financial market reactions to money surprises when both U.S. and Canadian surprises are included as regressors to those when only one of the surprises is included as a regressor.

Third, a natural byproduct of this estimation is that the stylized facts regarding Canadian interest rate movements in response to U.S. unanticipated monetary growth, and U.S. interest rate movements in response to Canadian unanticipated monetary growth, are generated. These may be helpful in shedding light on the monetary policy debate in both countries.

Table 1 presents for an October 1977 to October 1979 sample period, simple correlations between U.S. and Canadian week-to-week percentage changes in narrow money, as well as in the expected and unexpected components of these series. The latter decomposition utilizes, as an expectations proxy, the Money Market Services Inc. survey for the U.S., while Canadian expectations have been derived from an autoregressive model. ⁶ The former date is chosen to coincide with the inception of the U.S. survey, and the latter with a well-documented change in Federal Reserve policy. The highest cross-country correlation is 0.19, and this is between unanticipated Canadian and unanticipated U.S. monetary changes. This correlation is nearly significant at the 5% level. ⁷

In the upper panel of table 2, I present estimated responses of Canadian and U.S. 90-day T-bill and 20-year government bond yields, and, in the lower panel, response of the Canadian/U.S. dollar spot exchange rate, to unanticipated Canadian and U.S. week-to-week monetary growth. ⁸ Notice

⁵ The reality, however, given the relative sizes of the economies, is that we should really only expect potential problems for Canadian asset price movements, in particular Canadian interest rates and the Canadian/U.S. dollar foreign exchange rate.

⁶ U.S. monetary statistics are taken from the Fed's H.6 release, while Canadian statistics are from the Bank of Canada's *Weekly Financial Statistics*. For Canadian expected monetary growth, a bivariate autoregressive model has been estimated with lagged changes in both the money supply and the monetary base being included as explanatory variables. See Deaves (1988) for details. Residual bias has been removed for both the U.S. and Canada using the method of Deaves, Melino and Pesando (1987).

⁷ In particular, the pertinent $F(1, 95)$ statistic is 3.90.

⁸ Data on Canadian interest rates and the Canadian/U.S. dollar foreign exchange rate were taken from the Bank of Canada's data base and from quote sheets of the Securities Department of the Bank of Canada. For more information, see Deaves (1988). The interval for Canadian yield changes was from 3:30 PM Thursday to 10:30 AM Friday. U.S. 3-month T-bill and 20-year government bond yields were obtained from the Federal Reserve's H.15 release. From these afternoon quotes, full-day interest rate changes (for intervals containing both announcements) were calculated. The few observations when both U.S. and Canadian announcements did not take place on Thursday or when asset price changes over narrow intervals were unavailable (due to market closings) were omitted from the sample. The 105 announcement weeks in the overall sample (Oct. 6/77-Oct. 4/79) are thus reduced to 97.

Table 2

Response of Canadian and U.S. interest rates and the Canadian/U.S. dollar exchange rate to Canadian and U.S. money surprises (based on $DMV_t = b_0 + b_1 -UMCN_t + b_2 -UMUS_t + e_t$).^a

Instrument/ Interval	b_0	b_1	b_1^*	b_2	b_2^*	SEE	R^2	DW
<i>(a) Interest rates</i>								
Canadian T-bills	-0.001 (0.002)	0.070 (0.120)	0.051 (0.118)	-0.331 (0.414)	-0.284 (0.404)	0.02	0.01	1.96
U.S. T-bills	0.018 (0.012)	0.231 (0.786)	0.649 (0.795)	7.252 * (2.704)	7.409 * (2.638)	0.11	0.08	1.51 ⁺
Canadian Bonds	0.002 (0.002)	-0.011 (0.1600)	0.059 (0.160)	1.219 * (0.549)	1.211 * (0.535)	0.02	0.05	1.80
U.S. Bonds	0.006 * (0.002)	0.325 * (0.168)	0.418 * (0.170)	1.615 * (0.577)	1.837 * (0.574)	0.02	0.11	1.50 ⁺
<i>(b) Spot exchange rate</i>								
Noon to 4:30 PM	-0.037 * (0.0015)	0.405 (1.028)	0.292 (1.004)	-1.957 (3.536)	-1.681 (3.450)	0.15	0.00	1.90
4:30 PM Noon	0.056 * (0.018)	-3.067 * (1.225)	-2.816 * (1.201)	4.361 (4.213)	2.266 (4.242)	0.18	0.07	1.61 ⁺
Noon to Noon	0.019 (0.022)	-2.663 * (1.496)	-2.524 (1.460)	2.404 (5.144)	0.586 (5.099)	0.22	0.03	2.19

^a DMV_t = change (in basis points) in relevant market price or yield over announcement interval; $UMCN_t$, $UMUS_t$ = percentage changes in unanticipated Canadian and U.S. money supplies using specified proxy. Significance at 5% denoted by * and significance at 10% denoted by #; standard errors are in parentheses. For the three equations where the DW statistics suggested first-order serial correlation (denoted by ⁺), the regressions were rerun using the Cochrane-Orcutt correction method. As the results were very similar, they are not presented here.

that, in the lower panel, equations are estimated for a noon to 4:30 PM interval (which contains just the U.S. announcement), a 4:30 PM to noon interval (which contains just the Canadian announcement), and a wider noon-to-noon interval which contains them both. The efficient markets model is utilized for this purpose:

$$DMV_t = b_0 + b_1 UMCN_t + b_2 UMUS_t + e_t,$$

where

DMV_t = change in market variable yield or price over an interval containing either U.S. or Canadian money supply announcement at t (or both).

$UMCN_t$ = unexpected percentage change in Canadian money supply at t .

$UMUS_t$ = unexpected percentage change in U.S. money supply at t .

b_0, b_1, b_2 = intercept and slope parameters.

e_t = random error term.

Also I will present partial results for regressions which exclude either the Canadian or the U.S. money surprise. The column labelled b_1^* shows the slope coefficients and standard errors when the only independent variable is Canadian surprises, and similarly the column labelled b_2^* provides the slope coefficients and standard errors when the only independent variable is U.S. surprises. It is

apparent that the interdependence between U.S. and Canadian money surprises has only a slight effect.⁹ This becomes clear when a comparison is made of columns b_1 and b_1^* and of columns b_2 and b_2^* . Thus I will now concentrate on the full regressions.

Turning to these, previous U.S. empirical results are confirmed, and several new findings are revealed. As others have shown, both short-term and long-term U.S. interest rates tended to increase in response to U.S. money surprises prior to October 1979, but the value of the U.S. dollar was unaffected.¹⁰ Canadian 20-year bond yields are also positively correlated with U.S. surprises, moving about 75% as much as U.S. long-term bonds.¹¹

As for Canadian M1 surprises, there is evidence that the Canadian dollar tended to increase in value relative to the U.S. dollar in response to Canadian money surprises at this time. This is consistent with a view that market participants expected the Bank of Canada to counteract money surprises in the late 1970s. Note that the narrower interval, from 4:30 PM to noon the following day, provides a stronger result than the full-day interval due to the minimization of intervening noise.¹²

One curious finding is that U.S. long-term bond yields also increased significantly in response to Canadian surprises. Given the relative sizes of the two economies and capital markets, and the fact that Canadian long-term bonds did not budge, it is likely that this result is spurious. The fact that both the magnitude and significance decline when the U.S. surprises are included the regression reinforces this view.

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⁹ One can take another approach. If one 'updates' the Canadian expectation with the U.S. surprise (which is appropriate since the U.S. announcement takes place earlier), then the adjusted Canadian surprise (now by construction orthogonal to the U.S.) will yield the same estimated response coefficients either as the only regressor or paired with U.S. surprises.

¹⁰ See, for example, Roley and Walsh (1985) for interest rate evidence and Hakkio and Pearce (1985) for exchange rate evidence.

¹¹ Given the Bank of Canada's policy of exchange rate stabilization at the time, it is difficult to discern whether the co-movement in Canadian and U.S. long-term bond yields reflects real or nominal interest rate changes. This is an important issue since it might shed light on the debate concerning market perceptions of Federal Reserve policy.

¹² One source of potential noise is of course the U.S. money supply announcement, but the results for the earlier noon to 4:30 PM interval indicate that the exchange rate was virtually unaffected by this announcement. One of the lessons of this note is that there are two ways to deal with potentially important interdependent announcements taking place very near each other: either narrow the interval to exclude one of them, or include both pieces of information as independent variables.