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Japan's "Money Focused" Monetary Policy

Michael M. Hutchison*

This article studies the evolution of the Bank of Japan's methods of implementing monetary policy since the move to floating exchange rates in 1973. Analysis of both institutional changes and empirical data on the central bank's behavior suggests that the Bank of Japan has followed a flexible approach to monetary policy. Japan's move away from direct credit controls toward more flexible short-term interest rates over the past decade does not represent a "money-focused" monetary policy in the sense of a close adherence to a constant money growth rule.

The Bank of Japan's success in maintaining the lowest rate of price inflation among the major industrial countries since the mid-1970s has been a source of envy for many central bankers, especially since low inflation was accomplished without a major recession even after the second oil price shock in 1979. There are many reasons for this success, but the dominant view cites the gradual deceleration of trend money growth over the last decade (Chart 1) as the Bank of Japan moved to a so-called "money focused" monetary policy (Suzuki, 1985).

A number of academic economists and others have therefore pointed to monetary policy in Japan as a potential model, at least in part, for the Federal Reserve to emulate. Some of these economists have interpreted the Bank of Japan's policy as following classic "monetarist policy prescriptions"¹, even though the Bank of Japan does not publicly state a policy objective that suggests a traditional monetarist strategy of strict adherence to a pre-determined

money growth rule. An Executive Director of the Bank of Japan has stated that ". . . even though the Bank of Japan emphasizes the money supply, we are not blind to other indicators. We consider money supply movements in an overall framework that includes prices, output, the balance of payments, interest rates at home and abroad, and attitudes of financial intermediaries to lending."²

The objective of this paper is to investigate the extent to which monetary policy in Japan has followed a "monetarist" strategy in practice, as opposed to the publicly stated policy of an eclectic approach. This article studies the constraints on policy in Japan and the evolution of the Bank of Japan's methods of implementing monetary policy since the move to floating exchange rates in 1973. (The pre-1973 obligation to fix the yen/dollar rate closely tied Japanese monetary policy to foreign influences and thereby limited the Bank of Japan's discretion.) It analyses both institutional changes and empirical data on the behavior of the Bank of Japan.

Our approach does not attempt to answer the broader questions of why inflation has been low and output stable in Japan over the last decade. By focusing on the Bank of Japan's behavior, however, we are able to shed light on whether Japan's success with managing inflation was occurring in tandem with the implementation of a so-called monetarist policy strategy.

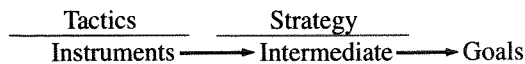
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The paper is divided into four sections. The first presents a simple framework for understanding the process of monetary policy and distinguishing between monetarist policy and nonmonetarist policy. This section defines terms and draws out both institutional factors and empirical regularities that are likely to be associated with a monetarist policy strategy. The second section investigates the institutional aspects of the evolution of the Bank of Japan's

operating techniques and procedures over the last decade. The institutional evidence is compared to the *a priori* predictions associated with a monetarist strategy. The third section of the paper is empirical, and investigates whether the Japanese experience fits a number of implications and predictions of traditional monetarism. The final section draws some policy implications from the analysis.

I. Defining A "Monetarist" Policy: Tactics and Strategy

Monetary policy may conceptually be divided into several operational stages that help to distinguish a "monetarist" policy from a discretionary counter-cyclical policy. Schematically, the basic stages may be represented as (Cargill and Garcia, 1985):



The goals of monetary policy generally are set in terms of growth of real GNP, employment, and prices, with perhaps a balance of payments or exchange rate objective or constraint. The instruments of policy are variables over which the central bank has more or less direct control, such as the level of borrowed and nonborrowed reserves, interbank interest rates, the discount rate, the level of reserve requirements and, perhaps, the quantity of bank lending.

In general, the policy instruments do not affect the ultimate policy goals directly. Thus, in manipulating its instruments to achieve the ultimate goals of policy, central banks generally set targets for some intermediate variables. The intermediate variables, such as various money aggregates or market interest rates, are assumed to exert an important influence on the variables that have been selected as the ultimate goals of policy. Presumably, the central bank can exert greater direct control (less "slippage") over the intermediate variables than over the ultimate policy goals through its manipulation of operating instruments. In other words, the intermediate variables are used as links in the implementation of policy.

The strategy of monetary policy involves both the choice of the intermediate target variables and the

target ranges deemed necessary to obtain the desired final policy goals. The tactics of policy involve the choice of operating instrument variables designed to control the intermediate targets.

The most important distinction between "monetarists" and "non-monetarists" in terms of policy prescriptions involves the appropriate monetary policy strategy, that is, the choice of intermediate target and the stand on whether intermediate targets should be varied to attempt to counteract business cycle fluctuations. To be specific, a monetarist strategy would choose a money aggregate as an intermediate target (as opposed to market interest rates or a broad measure of credit) and set it to grow at a fairly steady rate — some would suggest a constant rate (Friedman, 1960). Traditional monetarist policy strategy argues against varying the intermediate target in counter-cyclical policy moves designed to "fine tune" the economy. Its reasoning is that such attempts usually lead to greater uncertainty in the economy, and exacerbate, rather than dampen, swings in the business cycle.

The pursuit of a monetarist policy strategy is likely to be associated with a particular institutional framework and a number of empirical implications, several of which are investigated below for Japan's experience. The institutional framework must make available policy instruments that are effective in targeting money as an intermediate objective. Enough variation in the operating instruments (for example, interbank interest rates) must be allowed within the framework to permit fairly precise monetary control if a monetary strategy is followed. That is, the tactics of policy must be consistent with a monetarist strategy.

In terms of empirical predictions, the transition from a non-monetarist to a monetarist policy regime

is expected to be associated with less money variability and, perhaps, greater interest rate variability (to the extent that maintaining steady money growth precludes the central bank from "smoothing" interest rate fluctuations). More generally, the stochastic time series properties of the money stock normally would be significantly different under the two regimes. In particular, one would expect stronger negative correlations between money growth in the present period and its past values under a monetarist regime because any past deviations from constant money growth would tend to be offset in current and future periods.

II. Monetary Policy in Japan: Institutional Features

The traditional tactics of monetary policy in Japan have emphasized control of interbank interest rates, direct credit controls on commercial bank lending, and changes in both the official discount rate and reserve requirement ratios.

Monetary policy by the Bank of Japan on a day-to-day basis has traditionally focused on control of the interbank money market, which consists largely of call loans and commercial bills traded among financial institutions. Similar to the role of the Federal Reserve in the federal funds market in the United States, the Bank of Japan is able to exert control over interbank interest rates by influencing the level of aggregate reserves available to the banking system. Japanese financial institutions are required to maintain legal reserves on their deposit liabilities with the Bank of Japan. By exerting various degrees of aggregate "reserve restraint," the central bank can influence conditions in the interbank market where banks trade reserves among themselves and thereby affect the call money and commercial bill interest rates.

The link between the Bank of Japan's restraint on bank reserves and interbank interest rates has traditionally been rather direct. In particular, a large percentage of total reserve assets posted at the Bank of Japan by financial institutions are "borrowed reserves" subject to recall at the discretion of the monetary authorities.³

The reserve requirements system in Japan amounts to a mix between a contemporaneous and a lagged reserve system.⁴ Financial institutions affiliated with the system are required to place legal

A final point concerns the feedback relationship between the central bank's operating instruments and the intermediate target. Under a monetarist policy regime, there would be two-way feedback between the control instruments and the intermediate target: the operating instruments would be systematically set to move future money growth toward the targeted range. Also, the central bank would systematically consider past money growth (particularly swings outside the target range) when it determines the current value of its operating instrument.

reserves (vault cash is not included) with the Bank of Japan, in an amount equal to the monthly average of outstanding deposits (calculated from the first day to the last day of the month) times the reserve ratio, during a reserve maintenance period beginning from the 16th day of the month through the 15th day of the following month. Each institution can choose its daily rate of reserve accumulation *during* a given reserve maintenance period. The "reserve progress ratio" on any day is the ratio for the current maintenance period of reserve deposits accumulated to reserve deposits required for the period.

The Bank of Japan is able to raise interbank interest rates by limiting overall credit provisions to financial institutions, and thereby maintain a low aggregate reserve progress ratio during the greater part of the reserve maintenance period. As financial institutions attempt to meet the required reserves ratio by the end of the maintenance period and run up against the Bank of Japan's greater reluctance to extend more credit, they turn to the interbank market. Greater competition for funds in the interbank market cause interbank interest rates to rise.

Although the Bank of Japan adjusts its credit to financial institutions to allow financial institutions' reserve deposits (eventually) to meet their legal reserve requirements, interbank interest rates nevertheless tend to rise during periods of "reserve restraint." This is because the Bank of Japan's "moral suasion" during periods of restraint causes financial institutions to become reluctant to extend their borrowed reserves credit lines, and to prefer to purchase reserves from the interbank market.

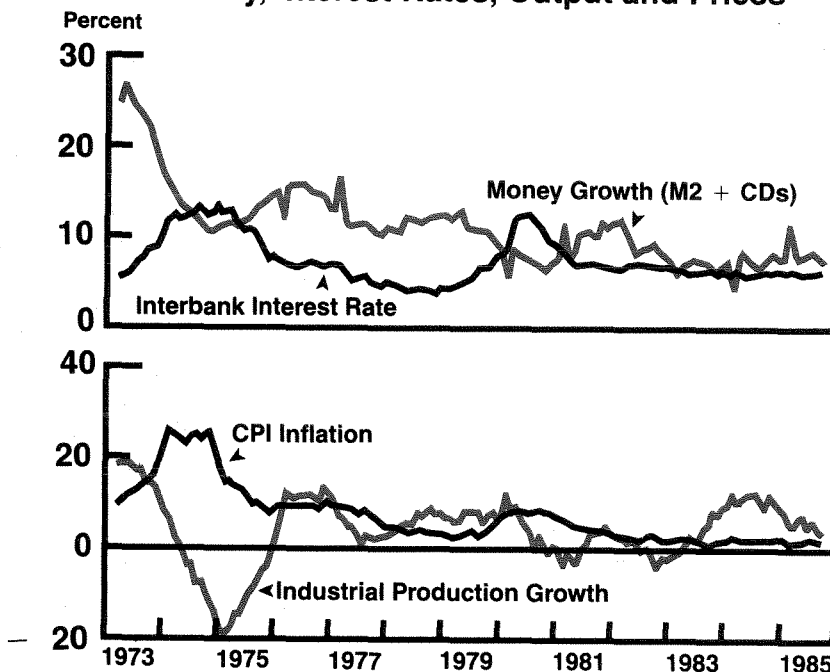
In effect, the Bank of Japan's attitude toward lending comprises an important, although supplementary, element in the Bank's control over interbank interest rates. It causes financial institutions to distinguish between reserves obtained directly from central bank credit and reserves obtained through the interbank market. Moreover, the Bank of Japan's lending operations have an especially large influence over interbank rates because excess reserves held by financial institutions are generally very small.⁵

Another instrument of monetary control in Japan that has been important as a supplementary measure is the central bank's direct quantitative control over commercial bank lending (so-called "window guidance"). Window guidance is also a form of "moral suasion" that has been used at times of monetary restraint when the Bank of Japan wanted to limit deposits and money creation by limiting the increase in the total loan volume of individual banks.

Individual banks have apparently not resisted "window guidance" partly because of their heavy dependence on borrowed reserves from the Bank of Japan, and partly because they perceive that long-term customer relations would not be adversely affected by following credit controls during periods of general credit restraint. Moreover, during periods of monetary restraint (when interbank rates are rising) the cost of funds to banks increases. Since their loan rates are also subject to administrative "guidance" and, as a consequence, are fairly rigid (Suzuki, 1985; p. 6), this induces them to reduce their lending.⁶

Although monetary control in Japan has traditionally worked primarily through Bank of Japan's credit adjustments and, as a supplementary measure, direct controls on bank lending, changes in the official discount rate and reserve requirement ratios also have been important instruments.⁷ These latter instruments are employed much less frequently, and have served both to "signal" and to make responses

Chart 1
Money, Interest Rates, Output and Prices*



*Growth rates are calculated against same month of previous year.

to changing economic conditions and significant changes in underlying policies.

The Bank of Japan has used a number of separate instruments to accommodate seasonal fluctuations in money demand, as opposed to implementing short and medium-term policy actions and accommodating longer term money demand growth. Largely in response to seasonal "surplus" funds, the Bank of Japan sells bills of exchange drawn on itself to short-term money market dealers to tighten money market conditions. Similarly, the Bank purchases private commercial bills possessed by financial institutions (again via short-term money market dealers) in large part to provide credit to accommodate seasonal shortages in the interbank market. These operations are analogous to Federal Reserve repurchase agreements (repos) and matched sales-purchases of securities designed to even out seasonal money market swings.

In contrast, the Bank of Japan supplies base money growth over longer periods largely by purchasing government securities (10-year government bonds) directly from financial institutions. Prior to 1963, the Bank of Japan concentrated most credit expansion in direct lendings to financial institutions. Analogous Federal Reserve operations are outright purchases of government bills and coupon securities.

Changes in Monetary Policy Tactics

The Bank of Japan's basic tactics for implementing monetary policy have changed in two major ways since the mid-1970s. The Bank has encouraged greater interest rate flexibility and de-emphasized credit controls, although adjusting reserves and controlling interbank interest rates through its lending to financial institutions remain the predominant instruments of short- and medium-term monetary policy.

Policymakers now attach greater emphasis on daily movements in interest rates as an instrument of policy. This new emphasis is reflected in Table 1 which shows increasingly frequent daily changes in the interbank interest rate.⁸ Since 1981, the Bank of Japan has also spurred interest rate flexibility through sales of short-term government Treasury bills. These sales have facilitated interest rate arbitrage between the interbank and open markets. Moreover, the terms on which the Bank of Japan has purchased government bonds from financial institutions since 1978 have also gradually come to reflect market forces.⁹

Policymakers also have de-emphasized direct quantitative controls on bank lending.¹⁰ In particular, they have removed "window guidance" as a binding condition on bank lending and, therefore, as a means of monetary control in recent years.¹¹

TABLE 1
Interest Rate Changes in Japan

A. Number of Changes Per Year in Unconditional Call Money Interbank Interest Rate

<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
8	20	58	82	178	205	204	202	179	199

B. Number of Changes Per Year in the Official Discount Rate

<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
0	3	1	3	4	2	0	1	0	0

Source: Fukui (1985)

Changes in the relative emphasis of operating instruments and greater flexibility in the interbank interest rate operating target have occurred in tandem with the liberalization of open market interest rates in Japan. Greater flexibility of open market interest rates and development of secondary securities markets have increased the importance of the interest rate channel in transmitting monetary policy to the economy (Suzuki 1985, Cargill 1986). In this sense, a broader "opportunity set," or selection, of channels of transmission are now available to the Bank of Japan in its pursuit of monetary policy objectives.

Taken in this context, neither the relaxation of controls on commercial bank lending nor greater emphasis on interbank day-to-day interest rate flexibility necessarily represents a move to the monetarist strategy of targeting a money aggregate. The switch in the Bank of Japan's tactics is equally consistent with targeting open market interest rates as an intermediate objective. However, in light of

Japan's move to floating exchange rates, and consequent elimination of the formal obligation to pursue a monetary policy strategy consistent with maintaining fixed exchange rate parities, the shift in policy tactics is broadly consistent, or at least compatible, with the hypothesis that the Bank of Japan has adopted a monetarist strategy.

Other institutional evidence also appears consistent with the view that the Bank of Japan is now placing greater emphasis on the control of money aggregates than in the past. This evidence includes both the number of policy statements by the Bank of Japan since the mid-1970s¹² and the announcement since July 1978 of quarterly money "projections" as a broad measure of money growth ($M2 + CD$ s).¹³ Moreover, while officials of the Bank of Japan indicate that they are paying greater attention to the growth of money aggregates in conducting policy, they also stress that they are giving a smaller role to lending by financial institutions as an intermediate target (Fukui, 1986).

III. Short-term Monetary Policy in Japan: Empirical Regularities

Traditional monetarism makes extensive use of money aggregates as an intermediate target. In this section, we study the empirical evidence on the extent to which the Japanese central bank's presumed "money focused" policy follows the traditional model.¹⁴

Since interbank interest rates remain the Bank of Japan's direct operating target, we look at the extent to which the central bank attempts to maintain money growth along a predetermined path by systematically changing the interbank interest rate. As discussed, one would expect to observe significantly less money variability and significantly greater interest rate variability under a money targeting regime.

Data Trends

Table 2 shows the means and standard deviations of several key monthly economic statistics in Japan ($M2 + CD$ s, interest rates, industrial production and consumer price inflation) for the floating

exchange rate period 1973-1985. The post-1973 sample was chosen because it represents a fundamental departure from the money supply process associated with a fixed exchange rate regime, and also because empirical work by Ökubo (1983) and Hamada and Hayashi (1985) suggests that the money supply process shifted in 1973¹⁵. Moreover, work by Blundell-Wignall, et al. (1984) and Hamada and Hayashi (1985) suggest structural change in the money demand function in 1973 that was potentially related to shifts in monetary regimes.

The focus on the post-1973 period is important. A number of researchers (for example, Meltzer 1985 and Friedman 1985) have contrasted the fixed and floating rate periods. They have emphasized the switch in monetary regimes and the simultaneous falling-off in the average rate of money ($M2 + CD$) growth from 16.2 percent (s.a.a.r.) between the first quarter of 1960 and the first quarter of 1973 to 10 percent between the second quarter of 1973 and the

third quarter of 1985, and the decline in money variability (the standard deviation fell from 12 percent to 3 percent the two periods).

The pre-1973 period, however, cannot be reasonably considered a discretionary policy regime and used as a basis of comparison. Under the fixed exchange rate system that prevailed before 1973, the central bank was given only a limited degree of discretion in its conduct of policy. The need to maintain fixed exchange parities meant that domestic monetary policy was subject to foreign money shocks. Moreover, as emphasized by Ōkina (1985), structural change after the mid-1970s could be associated with the first oil shock as well as a switch in monetary policy rules or the shift to floating exchange rates. Our analysis of the extent to which the Bank of Japan has followed "monetarist" policy prescriptions therefore focuses on the period since 1973.

Also shown in Table 2 is a division of the sample into periods before and after July 1978 — the date of the first quarterly money supply "projection" in Japan. Although it is difficult to pinpoint the date of an abrupt shift in the Bank of Japan's policy regime, most Japanese policymakers have indicated the latter 1970s as a time of gradual change and would clearly include the post-1978 period as falling within the new "money focused" regime.

Table 2 and Chart 1 clearly indicate that average money growth and inflation in Japan have been declining since the mid-1970s. Somewhat surprisingly, the month-to-month variance of money around both its mean and (declining) trend growth has increased since the introduction of money "forecasts" in July 1978. This is true whether money growth is measured on a month-to-month, quarter-to-quarter, or semi-annual basis. And even though the interbank interest rate moves more frequently on

TABLE 2
Key Economic Statistics in Japan
(March 1973-September 1985)

<u>Variables</u>	<u>Full Sample</u>	<u>First Period</u>	<u>Second Period</u>
(Month-to-Month Percent Change at Annual Rates)	March 1973-Sept. 1985	March 1973-July 1978	August 1978-September 1985
M2 + CD (s.a)			
Mean	10.0	12.4	8.3
Std. Dev.	8.7	7.4	9.3
Std. Dev. Around Trend Money*	8.4	7.3	9.2
Interbank Interest Rate (Level)			
Mean	7.53	8.26	6.98
Std. Dev.	2.51	2.98	1.92
Industrial Production (s. a)			
Mean	3.2	1.6	4.4
Std. Dev.	16.3	17.0	15.7
Consumer Price Index (s. a)			
Mean	6.8	11.3	3.4
Std. Dev.	8.6	10.3	5.0

*Trend Money Growth Equation: $M = 15.27 - .055T$
(4.31) (-1.54)

where $M = M2 + CD$ (Monthly percent change at annual rate). Estimation period is March 1973 through September 1985. $R = .009$; $SER = 3.59$; $\bar{M} = 10.3$. Trend money at time t is the predicted value, M_t , from the regression.

a day-to-day basis than before (Table 1), Table 2 and Chart 1 clearly show that its monthly variability has declined somewhat since July 1978. Put differently, its monthly variability has not increased as one might have expected if the Bank of Japan had closely followed monetary targeting.¹⁶ The variability of output growth, in contrast, is roughly the same in both periods. Mean output growth, however, rose sharply from 1.6 percent during the period 1973-1978 to 4.4 during the period 1978-1985.

Another summary measure of interest is the autocorrelation function of money (expressed in month-to-month percent changes), which is the correlation of money with its past values. The function is useful in determining whether there is any particular pattern in the money time series. A sharp shift in the autocorrelation functions between pre- and post-1978 periods would indicate a major difference in the time series pattern of money. The switch

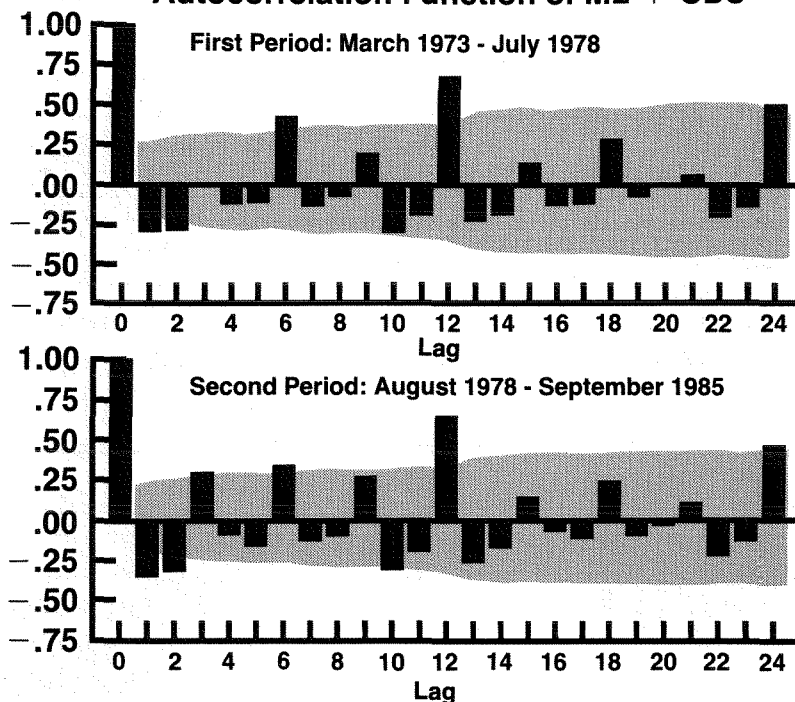
toward a more monetarist regime (constant money growth rule) would lead one to expect, *a priori*, greater negative autocorrelations because any past deviations from constant money growth (picked up in the constant term) would presumably be offset in current and future periods.

A comparison of the two periods, shown in Chart 2, indicates that the stochastic process generating M2 + CDs in Japan was virtually unchanged between the two periods, although the first two autocorrelations increased slightly. Both series are clearly dominated by seasonality factors, but all the autocorrelations are nevertheless very close. There is no evidence of a significant and systematic move to a constant money growth rule.

Causality Tests

The discussion above emphasizes that one should observe a systematic two-way feedback between the operating control instrument and the intermediate

Chart 2
Autocorrelation Function of M2 + CDs*



*Shading indicates within two standard errors.

money target under a monetarist policy strategy. We used the Granger causality method to investigate this relationship for the Bank of Japan's policy actions (Granger, 1969).

The Granger causality method asserts that a variable x "Granger causes" a variable y if fluctuations in x can be used to predict subsequent movements in y after taking into account other relevant information (such as past values of y and a third variable, z). Similarly, y "Granger causes" x if fluctuations in y can be used to predict subsequent movements in x . When x "Granger causes" y , and y "Granger causes" x , two-way feedback exists between the variables. The phrase "Granger causes" is substituted for "causes" in order to emphasize the particular statistical definition used and its statistical shortcomings (such as the limited information set, potential contemporaneous correlation between the endogenous variables, lag length selection, and sample period).

We investigated causality in the context of a three-variable, reduced-form system for the process generating money (M_t), interest rates (i_t) and nominal retail sales (S_t) in Japan. Our main focus was the relationship between money and interest rates. Retail sales were included to control for the response of money and interest rates to business cycle fluctuations. Nominal values were used to capture both output and price movements and therefore to save degrees of freedom. Retail sales rather than GNP was used because only the former is available on a monthly basis. Our maintained structure therefore is a system where M_t , i_t and S_t are jointly determined endogenous variables. The reduced-form of the model is:

$$\begin{aligned} M_t &= L(\pi_{11})^G M_{t-1} + L(\pi_{12})^P i_{t-1} + L(\pi_{13})^N S_{t-1} + \mu_{1t} \\ i_t &= L(\pi_{21})^G M_{t-1} + L(\pi_{22})^P i_{t-1} + L(\pi_{23})^N S_{t-1} + \mu_{2t} \\ S_t &= L(\pi_{31})^G M_{t-1} + L(\pi_{32})^P i_{t-1} + L(\pi_{33})^N S_{t-1} + \mu_{3t} \end{aligned} \quad (1)$$

where

$$\begin{aligned} M_t &= M2 + \text{CDs (percent change)} \\ i_t &= \text{call money rates (percent change)} \\ S_t &= \text{nominal retail sales (percent change)} \end{aligned}$$

$L(\cdot)^j$ = the polynomial lag operator of order j , that is, $L(\pi_{11})^{12} M_{t-1}$ represents the 12 coefficient values on money lagged one to twelve periods.

TABLE 3

Tests of Granger Causality Between Money, Interest Rates and Retail Sales

(F-statistics for test that the row variable does not cause the column variables^a)

A. Full Sample 1973.3 - 1985.9			
	S	i	M
S	2.93*	.50	1.43
i	.83	3.59*	3.81*
M	.67	.69	5.74*

B. First Subperiod 1973.3 - 1978.7			
	S	i	M
S	.75	.99	1.32
i	.65	1.04	1.08
M	.73	1.06	1.71

C. Second Subperiod 1978.8 - 1985.9			
	S	i	M
S	1.40	.52	1.32
i	.75	1.59	1.70**
M	.89	.74	3.27*

^aResults are from a 3-variable VAR system estimated with monthly data using 12 lags for each variable. S is nominal retail sales, i is the call money rate, and M is M2 + CDs. All variables calculated in monthly percent changes.

*Significant at the 1 percent level.

**Significant at the 5 percent level.

The π s are nonlinear functions of the parameters of the maintained structure.

The equations in 1 are the standard equations for the Granger variant of causality testing. To the extent that interest rates are the primary monetary operating instrument in Japan, and rate changes influence the money aggregates, $L(\pi_{12})$ should be a non-zero coefficient vector, that is, i “Granger causes” M in the sense that past values of interest rates add relevant information to predicting money. Similarly, if the Bank of Japan were systematically shifting its operating instrument — call money rates — in response to a money aggregate intermediate objective, then the $L(\pi_{21})$ coefficient vector would be non-zero (M “Granger causes” i). If both the $L(\pi_{12}) = 0$ hypothesis and the $L(\pi_{21}) = 0$ hypothesis could be rejected, then there would be “feedback” between money and interest rates as the basic money targeting model (with short-term interest rates as the primary operating instruments) predicts.

Table 3 presents the F-statistic test results from estimating the equation system 1. Money, interest rates, and retail sales were expressed in monthly percent changes to create stationary series. All series were seasonally unadjusted, and seasonal dummy variables were included in the regressions to control for seasonal factors.

Lag length selection (parameters G, P and N in system 1) is potentially very important to the causality test results. Twelve monthly lags were chosen for all of the variables in the tests, but no pre-testing of various lag lengths was conducted. The twelve monthly lags were chosen based on various policy statements by officials of the Bank of Japan regarding the period of monetary targeting.¹⁷

The full sample (March 1973-September 1985) results suggest significant unidirectional causality running from interest rates to money, but no feedback causality from money to interest rates. Evidence for the former lies in the highly significant (at the one percent level of confidence) coefficient of lagged interest rates in the money equation in Table 3 (given a 3.81 F-statistic). The full-sample results indicate that money adds no additional explanatory power to that imbedded in past interest rates and retail sales in predicting interbank interest rates (the F-statistic is 0.69).

These results are consistent with the Bank of

Japan's policy statements and the preceding discussion that the primary operating instrument of monetary policy was the interbank interest rate, and that interest rates are an important channel for transmitting monetary policy to the economy. Interest rates clearly lead money in these results. However, the results are not consistent with a practice of systematic changes to the interbank rate operating control variable in response to deviations of money. If money were an intermediate target closely followed by the Bank of Japan, then one would expect to find two-way “feedback” between the money and interest rate series.¹⁸

It is possible, however, that the Bank of Japan placed less emphasis on money in the period before the beginning of the announced money projections in July 1978. Then one may suspect that the full sample results could be contaminated by the inclusion of the earlier period. In particular, there is the possibility that the August 1978-September 1985 period would show feedback causality running from money to interest rates, whereas the earlier March 1973-July 1978 period would not.¹⁹

Table 3 results do, in fact, suggest a discernible shift in the causal relationships between money and interest rates. In particular, they indicate no evidence to suggest that money “Granger causes” interest rates or that interest rates “Granger cause” money during the March 1973-July 1978 period. In contrast, during the July 1978-September 1985 period following the beginning of money supply “projections,” there is clear causality running from interest rates to money. Again, however, this causality is unidirectional, and money growth was found not to Granger cause interest rates even in the more recent period. Thus, it appears that the 1978-85 period is dominating the full sample period results.

For the 1978-85 period, there is evidence that changes in call money helped predict changes in money growth but not that money growth *systematically* helps to predict the call money rate policy instrument as would be the case if a precise money target were followed by the Bank of Japan. This finding nonetheless is consistent with the Bank's policy pronouncements that it has placed *greater* emphasis in recent years on the control of interbank interest rates as the primary operating

variable in implementing monetary policy. It is also consistent with the commonly accepted view that interest rate fluctuations have grown in importance as a channel of monetary policy transmission to the economy.

Overall, these causality test results provide some support for the view that, in recent years, the monetary authorities in Japan have placed a great deal more emphasis on interest rates, as opposed to direct credit controls, as an operating target in controlling the economy, including money fluctuations. There is, however, *no* evidence that the introduction of money “projections” in Japan in July 1978 was associated with a statistically significant and stable policy feedback rule running from money to interest rates. Hence, there is little evidence to suggest that the Bank of Japan has closely adhered to monetary targeting. It is noteworthy that this conclusion also is consistent with the descriptive statistics presented in Table 2. Those statistics show that although average money growth has declined steadily since the mid-1970s, its variance around trend has remained largely unchanged since the advent of floating exchange rates in 1973.

These results are consistent with other research on the relations between interest rates and money in

Japan, although the present interpretation of the evidence is somewhat different. Ōkubo (1983) uses the relative power contribution method to analyze causal relations among money, income, prices, and interest rates in Japan during several sample periods. Similar to the results presented above, Ōkubo finds strong *unidirectional* causality running from the call money rate to money after 1974 and also concludes that this evidence “. . . supports the usual contention that monetary control in Japan is effected not by changes in the (monetary) base, but rather by adjustment of policy-influenced interest rates” (p. 129). With no additional evidence, however, he also implies that these results are consistent with an “explicitly money-supply oriented” Bank of Japan policy. The analysis above questions Ōkubo’s interpretation of the regime shift in the early 1970s.

Okina (1985), in a somewhat different context, also expresses some doubt on the significance of the shift in the Bank of Japan’s operating procedures. He points to both the switch in exchange rate regimes and the aftermath of the first oil price shock as potential alternative candidates to explain lower Japanese money and income variability between the pre- and post-1973 periods.

IV. Conclusion and Policy Implications

The environment in which monetary policy in Japan is conducted has changed significantly since the move to floating exchange rates in 1973. Along with relaxation of a formal exchange rate objective, the Bank of Japan’s behavior has been modified by a gradual liberalization of the Japanese financial system: interest rate decontrol, the development of new financial instruments and financial markets, and fewer constraints on the asset and liability choices of investors, borrowers, and financial institutions.

These developments, in turn, have broadened the “opportunity set” of monetary policy instruments available to the Bank of Japan. In particular, the transmission of interest rate changes to economic activity is now more significant in the emerging deregulated Japanese financial environment. Partly in response to these changes, the Bank of Japan has emphasized interbank interest rates as the primary operating instrument of policy to a greater extent

than before, and has virtually discontinued direct controls over commercial bank lending.

The empirical results suggest that the move away from direct credit controls (“window guidance”) toward more flexible short-term interest rates does not represent a “money focused” monetary policy in the sense of a close adherence to a constant money growth rule. In particular, money variability has not declined in recent years in contrast to interest rate variability.

Moreover, it does not appear that up to a year’s lagged values of money help to explain fluctuations in the operating control variable of the central bank (interbank interest rates). This indicates that the Bank of Japan has not systematically moved interbank interest rates in response to deviations of money growth from its narrow targeted range since either the move to floating exchange rates in 1973 or the announcement of money projections starting in

1978. Nevertheless, we found clear causality running from interest rates to money in the later period (1978-1985), indicating the greater importance of the interest rate channel in transmitting monetary policy changes to the economy in a deregulated financial environment.

A cautious interpretation of these results is appropriate. No statistical evidence was found to suggest a systematic "causal feedback" between money and interest rates as even loose adherence to a money supply rule would generate. Moreover, neither the institutional nor the empirical evidence suggests that the Bank of Japan controls its interbank interest rate operating instrument in a systematic fashion designed to maintain control (up to a year) of money aggregates along a fixed or gradually evolving predetermined growth path. The evidence suggests that a more flexible approach to policy is followed, and that Japan's success at maintaining low and stable inflation and stable output growth cannot be attributed to its adoption of traditional monetarist policy prescriptions.²⁰

The task remains to identify the source of the Bank of Japan's success at slowing money growth. Conscious policy action by the central bank may

have been responsible, but at least three other factors may have lowered the trend rate of money demand growth. First, lower average inflation, perhaps associated with the rapid increase in interest rates by the Bank of Japan in response to the second oil shock, may have created less nominal money demand growth. Second, the sharp drop in the growth rate of potential real GNP in Japan following the first oil price shock in 1973 may have lowered the trend growth of real money demand.

Third, and perhaps most intriguing, the decline in trend money growth in Japan may simply be associated with the shift in the flows of funds away from intermediary channels of finance toward direct finance.²¹ In particular, this shift has tended to slow the growth of the banking sector and its liabilities — a good part of which constitute broad money in Japan.

The empirical evidence suggests that these explanations, and other potential explanations as well, serve as credible alternatives to the conventional wisdom that attributes slower Japanese money growth to a conscious systematic shift in the Bank of Japan's behavior since the latter 1970s.

FOOTNOTES

1. See Friedman (1985) and Greenwood (1985). Friedman, for example, recently stated that "... the Bank of Japan has been the least monetarist central bank in its rhetoric, the most monetarist in its policy ..." of all the major central banks.

2. Shimamoto, 1982, p. 82. Similarly, Suzuki (1985) recently stated that "... the policy attitude of the Bank of Japan over the past years ... is in my interpretation neither that of a post-Keynesian 'discretionary fine tuning' nor that of an 'x percent rule.' It is discretionary in that it allows for gradual tuning of monetary growth, and it conforms to a rule in the sense that it stabilizes money growth as much as possible and gives information to the public about policy in the form of forecast announcements. An appropriate term may be 'eclectic gradualism.'"

3. Lendings to financial institutions by the Bank of Japan may be withdrawn at any time at the option of the Bank (Fukui, 1986; p. 5).

4. The following discussion draws heavily on Fukui (1986), particularly pages 3-4.

5. The Bank of Japan's ability to control money and credit is also helped by the fact that almost all financial institutions in Japan are required to join the reserve requirement system. Moreover, all deposits by the general public at financial institutions are reservable, with the exception of "new money in trust," supplied by trust banks since the end of 1985.

6. The loan rates of deposit banks are less flexible than interbank rates because prime lending rates are linked to the official discount rate, and the cost of funds is still regulated except for CDs and money market certificates (Suzuki, 1985; p. 6).

7. The Bank of Japan provides financial institutions with loans at the official discount rate. Since the discount rate is below the interbank call and bill money rates, there is ordinarily an excess demand for the Bank's funds, which the Bank manages by rationing credit at its own discretion (Fukui, 1986; p. 5).

8. Fukui (1986, pp. 14-15) has identified three stages of interbank market liberalization that have allowed greater interest rate flexibility: (i) 1978-79, when the "quotation system" for call and bill rates (in which money market dealers operated as brokers and consulted with borrowers and lenders to determine "quotations" according to a formula based on a consensus between borrowers and lenders, changes in rates were infrequent) was abolished, and a diversification of maturities of instruments traded was developed; (ii) 1980-1982, when a liberalization of controls allowed arbitrage opportunities to develop to link the interbank and open markets; (iii) 1983 onward, when there was a further relaxation of controls on various transactions and introduction of new financial instruments.

9. The Bank of Japan is eager to expand the role of Treasury bills in its money market operations because the

bills are believed to offer the greatest degree of control. That is, T-bill operations influence interest rates in open markets directly whereas interbank rates are an indirect means of influencing market rates. The T-bill market nonetheless remains undeveloped, and the Bank of Japan's operations on these instruments are not conventional "open market" operations. In particular, the Bank of Japan is reluctant to repurchase Treasury bills sold to absorb funds because of its desire to see larger private holdings of these instruments.

10. According to an Executive Director of the Bank of Japan, "... in money supply management, interbank rate operations are the main tool, and window guidance is only a supplementary or stopgap measure. With this attitude, and in response to the growing monetary relaxation since the middle of 1980, the Bank of Japan has permitted city banks, long-term credit banks and all other financial intermediaries to lend as they wish." (Shimamoto, 1982; p. 83).

11. The Bank of Japan has expressed its willingness to reimpose credit controls on bank lending if controls seem desirable, however.

12. Suzuki (1985), for example, notes that "... Japan also shifted to a money focus as its intermediate objective in the last half of the 1970s" (p. 7-6). Moreover, Fukui (1986) notes "... As for intermediate objectives of monetary policy, emphasis has been placed on the control of money supply instead of ceilings on increases in lending by financial institutions to the non-banking sector" (p. 17).

13. The Bank of Japan publishes projections of the rate of increase in the average outstanding M2 + CDs each quarter over the corresponding quarter of the previous year. These projections tend to move gradually over time. For example, recent projection ranges were: 1978.3 - 1979.4, 11-12%; 1980.1 - 1981.2, 7-8%; 1981.4 - 1982.3, 9-10%; and 1982.4 - 1983.4, 8-9%.

14. Various Japanese policymakers and government economists have emphasized the introduction of broad money (M2 + CDs) as an important intermediate indicator. See, for example, Shimamoto, 1982; p. 82 and Suzuki, 1985; p. 5.

15. Hamada and Hayashi (1985) estimate money supply equations as functions of lagged money growth, lagged inflation, lagged industrial production growth, and lagged reserves to test Barro's anticipated money neutrality hypothesis. They find a significant shift in the function with the move to floating exchange rates in February 1973, but not at other potential shift points (December 1970, December 1973 or December 1974). There is doubt, however, whether the direct approach of estimating money equations as functions of ultimate policy variables to test for the degree of "policy discretion can disentangle money supply from money demand influences. See DeRosa & Stern (1977).

16. Meltzer (1985) notes that, in his estimation forecast error, variances for output and prices were reduced following the Bank of Japan's move to announce projections of money growth. He suggests that these announcements, if credible, increase information about money growth and reduce uncertainty (p. 40). Seemingly at odds with this interpretation, however, is that the variance of forecast errors of the M1 money stock and money growth variability generally increased after the move to announce projections (Meltzer, 1985; p. 15).

17. For example, an Executive Director of the Bank of Japan has stated that "... the Bank of Japan follows the money supply not weekly, but rather monthly and quarterly" (Shimamoto, 1982; p. 81). The Director of the Bank of Japan's Institute for Monetary and Economic Studies, in contrast, recently stated that, "there are three principal features of monetary targeting as practiced by the Bank of Japan since 1975. First, broad money (M2 + CDs) is chosen as the most important intermediate target. Second, the period of targeting is not a week, a month, or a quarter, but a year. Third, the target is not announced, but the forecast is announced quarterly in terms of the percentage increase over the previous year in the average money stock of the quarter concerned" (Suzuki, 1985; p. 5).

18. It is important to emphasize that, strictly speaking, feedback from actual money changes as deviations from the target range is what should be "causing" changes in the call money rate when money targeting is followed. However, as long as the target is not moved frequently, the Granger tests presented in the test should capture this variability from the target ranges. As footnote 13 indicates, changes in the Japanese "monetary projections" have been infrequent since 1978. Moreover, the Bank of Japan emphasizes that money projections are not to be interpreted as money targets in the United States.

19. Okubo (1983), for example, deletes the period immediately after 1973 "... to avoid the influence of the disorganized quarters at the time of the first oil crisis" (p. 117).

20. This interpretation also has been expressed by a number of Bank of Japan officials. For example, "... Thus, the attitude of Bank of Japan toward the money supply is, in a word, pragmatic. Given uncertainty, shifts in functions, and instabilities, we believe this stance most appropriate to conditions at home and abroad." (Shimamoto, 1982; p. 82).

21. See Cargill (in this *Economic Review*) for a detailed discussion of the shift in the flows of funds in Japan and its importance for increasing the role of direct finance, as opposed to indirect finance working through the banking system, in channeling funds from the surplus (household) sector to the deficit sectors (government and corporate sector) since the mid-1970s.

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