

Japan's Monetary Policy Transition, 1955-2005

James R. Rhodes

and

Naoyuki Yoshino

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James R. RHODES, Professor of Economics, National Graduate Institute for Policy Studies (GRIPS), 7-22-1 Roppongi, Minato-ku, Tokyo 106-8677 E-mail: rhodes@grips.ac.jp.

Naoyuki YOSHINO, Professor of Economics, Department of Economics, Keio University, 2-15-45, Mita, Minato-ku, Tokyo 108-8345, Japan. Tel. +81-3-5427-1283 Fax. +81-3-5427-1578. E-mail: yoshino@econ.keio.ac.jp.

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Abstract: This paper surveys the postwar evolution of Bank of Japan (BOJ) monetary policy. Using both qualitative and quantitative data, we describe the changes in the money supply process in response to changing institutional constraints. We focus on the transition from quantitative to qualitative control mechanisms, illuminating, in particular, the important role of the BOJ's lending guidance (window guidance) in the early periods and financial liberalization in subsequent periods. Monetary policy reaction functions are estimated and used to verify major changes in policy instruments, targets, and indicators. JEL: E42, E52, E51

I. Introduction

Monetary systems and policies receive little attention when economies are performing well. Until recently, there was not much interest in Japanese monetary policy. Through most of the postwar period, Japanese economic performance was strong. Low inflation with high and relatively steady output growth won the Bank of Japan (BOJ) plaudits from all quarters. Keynesians praised the Bank for following Keynesian policies while Milton Friedman characterized BOJ policymakers as “closet monetarists.” Not many economists outside of Japan were very interested in the actual workings of Japanese monetary policy. Most economists simply assumed—and a few even set out to prove—that Japan's monetary system was built on a strong institutional platform. For most, it was enough to know that monetary policy worked. If economists had bothered to look deeper, perhaps they would have wondered how it could have worked so well.

Since the bursting of the “economic bubble” in 1990, contemporary monetary policy has come under intense scrutiny. The BOJ, more than any other institution, has been held responsible for Japan's post-bubble stagnation. There is considerable irony here, since it is only in the recent period of criticism that the BOJ has acquired, in principle, the independence and instruments to conduct a modern monetary policy.

Until the monetary reforms of 1998, the BOJ was subordinate to the Ministry of Finance (MOF). Don't blame us, says the MOF, things worked well on our watch.

Japan's monetary policy has undergone a profound transition over the postwar period in response to structural changes in the institutional environment. It is insufficiently appreciated that the period of Japan's "miracle economy" (ca. 1955-71) was a period of tightly controlled financial markets. During this "high growth period," a limited menu of financial products was permitted to be sold at administratively determined interest rates and in highly segmented markets (Suzuki, 1980, 1987). Domestic financial markets were isolated from international markets by comprehensive capital controls.

The "bubble economy" (ca. 1985-90) overlapped a period of extensive financial liberalization. Current monetary difficulties follow in the wake of the "big bang" reforms that commenced in 1996. As part of these reforms, the new Bank of Japan Law, that took effect in April 1998, gave the Bank considerable independence from the Ministry of Finance (MOF) and other organs of the government.

From the point of view of monetary policy, the post-1955 period can be usefully divided into three policy regimes. The first period, which we refer to as the "quantitative control period," runs roughly from 1955 up to the breakdown of the Bretton Woods system of fixed exchange rates in early 1971. This was a period of comprehensive economic controls and bureaucratic guidance of markets. The bureaucratic control regime was shook to its foundations in the turbulent years of the early 1970s. The collapse of the fixed exchange rate system, Nixon's surprise opening to China, and the two oil shocks (1973-74 and 1979-80) ushered in a new era of globalization pressures. More shocks, both internal and external, followed. The next

twenty years witnessed a slow but deliberate liberalization of the Japanese economy and financial system.

The “financial liberalization period” (ca. 1971-90) brought about a substantial relaxation or elimination of many legal and administrative constraints on the financial sector. Economic growth remained strong and Japan was increasingly viewed as the leader in the emerging “Pacific Century.” The great asset inflation of the “bubble economy” era (ca. 1985-90) was initially viewed as a natural consequence of Japan’s economic prowess. Towards the end of the period, however, concerns that ordinary Japanese were being priced out of the housing market led to increasing pressure on the BOJ to take corrective action.

The “post-bubble stagnation period” (ca. 1990-2005) begins with the pricking of the asset bubble by the BOJ starting in 1989. The subsequent stagnation lasted for at least 15 years (it remains to be seen if the current expansion is sustainable). One of the distinctive features of this recent period is the adoption by the BOJ of policy tools and practices broadly patterned after those of the U.S. Federal Reserve System.

In what follows, we provide a succinct summary of Japan’s monetary policy transition over the postwar period. It is a panoramic view from several observation points. We ignore many details and nuances in order to focus on what we believe are the broad contours of policy. We emphasize the institutional constraints underlying these policy choices. Our descriptive analysis is based on BOJ policy statements, newspaper articles, and our reading of the relevant economic literature.

For convenience, we use the traditional instruments-targets approach in describing Japan’s monetary policy transition. Caution is required, however, in the interpretation of policies under this framework. Until recently, Japanese policy

instruments and implementation procedures deviated substantially from text book models based on the Anglo-American experience.

During most of the postwar period, key policy instruments and non-final targets were under the direct guidance of monetary policymakers. Final targets, however, were similar to those of other OECD countries. The final targets of the BOJ have consistently been three: economic growth, price stability, and balance of payments stability. Short-term emphasis has shifted between the three targets depending on current economic and political conditions. Over the long-term, price stability has been the dominant policy concern. Memories of the nearly disastrous hyperinflation of the early postwar period have had a long-term influence on the BOJ.

Our empirical work uses quarterly data. Many of the data are non-stationary in levels and have strong seasonality components. Some of the data, such as bank loans, are highly explosive during some time periods. Reported results satisfy conventional standards for stationarity or cointegration. The appendix provides definitions and sources for the original data.

II. Quantitative Control Period (ca. 1955-1970)

The years following World War II and the American Occupation were characterized by rapid economic growth. Over the period 1955-70, the real GNP growth rate averaged 9.7 percent. An often overlooked aspect of this “miracle economy” is the highly controlled nature of the supporting financial system. The domestic financial markets were segregated from the global markets by capital controls. Banks and other financial firms operated in highly segmented domestic markets. Virtually all interest rates were administratively controlled. The development of securities markets was suppressed.

During this period, banks provided over 90 percent of the funds for industrial and commercial expansion. As a consequence, there was a near one-to-one correspondence between investment spending and loan growth. Money growth was also highly correlated with loan growth. MOF, through money market dealers (*tanshi gaisha*), administered the call lending rate in the interbank market. Interest rates in the short-term money markets were *never* permitted to fall below the BOJ's discount rate. With interest rate spreads pre-determined, the incentive for banks was to maximize size and market share rather than return on assets. Consequently, the discount rate was a tool for adjusting the profit margin of banks and, hence, enforcing bank compliance with administrative guidance (*gyousei shidou*).¹ With BOJ loans rationed, the discount rate was *not* an important tool for controlling intermediate monetary policy targets.

During this period, the MOF provided an implicit guarantee that no bank would be allowed to fail and no bank did. Companies were tied to banks through the main bank system. Borrowers were tied to lenders through "relational banking" rather than market-based contractual relationships. Calder (1993) fittingly described the Japan of this period as a "bankers' kingdom."

Although BOJ policy makers faced a set of complex institutional constraints, the monetary policy that emerged was relatively simple (figure 1). With overall economic policy focused on high-speed growth, the BOJ's task was to support rapid investment while containing inflation. Bank loans were the logical intermediate target. Since indirect control of lending and investment was not possible under the interest rate control regime enforced by the MOF, the BOJ relied on quantitative control measures.

¹ "Administrative guidance" refers to bureaucratic directives that are not firmly grounded in formal law. Since these directives are said to depend on "voluntary" compliance, economists often assume they are ineffective. Japanese institutions, however, often provide incentives for compliance.

BOJ loans provided the main source of funds for bank loans. With the discount rate fixed below the interbank and open market lending rates, the demand for BOJ loans was highly elastic. BOJ credit was rationed to prevent “excessive competition” from generating explosive inflation.²

Bank loans were also directly controlled through a policy known as “window guidance.” The window in question was *not* the discount window at the central bank. Rather, it was the lending window at major banks. The BOJ provided periodic guidance to banks in the form of quarterly loan growth targets. Although this policy is often described as “moral suasion,” it is more appropriately considered an application of administrative guidance (*gyousei shidou*). Rhodes and Yoshino (1999) found a near perfect compliance with BOJ lending guidance. Figure 2 shows that city bank loans during this period stayed within one percent of the BOJ growth target (with the exception of 1964:4).

Banks had good reasons to “voluntarily” comply with window guidance. BOJ controlled access to the discount window and MOF approval was needed for new bank branches. BOJ loans and bank branches were crucial to increasing size and profitability. Bigger size led to larger window guidance allocations. Increased size conferred prestige and led to greater access to political markets.

Window guidance was generally used in cooperation with other policy instruments. Figure 3 indicates that window guidance and call rate changes tended to be mutually supporting (the discount rate moved in sync with the call rate). During periods of monetary tightening, the call rate was raised and the BOJ lowered its WG

² Reading the literature of the early postwar period, one frequently encounters the phrases “excessive competition” or “destructive competition.” One’s knee jerk reaction may be to dismiss such terms as self-serving nonsense, but they sometimes have meaning once the institutional context is understood.

target. This complementary employment of window guidance is the reason it is often described as a “supplementary tool” of monetary policy (Suzuki, 1987; Yasuda, 1981). In our view, it is more accurately described as a “primary tool” during this period because it allowed the BOJ to precisely control the volume of bank loans and monetary expansion. Since the call rate was always above the discount rate, there was an incentive for banks to “over lend” (Suzuki, 1987). Given the institutional environment, window guidance was crucial in preventing excessive lending and money growth.

In retrospect, the success of monetary policy during this period owed a lot to favorable banking conditions. High economic growth and captive borrowers made it easy to find good bank customers. With most lending collateralized by land, steadily rising land prices made lending appear virtually risk free. The quantitative control policy “worked” as long as banking markets were protected and high growth persisted. Such specialized conditions could not endure, but few people realized it at the time.

Table 1 shows the results of estimated reaction functions for BOJ loans ($LOAN_{boj}$) and Window Guidance (WG) using quarterly data. The *actual* guidance provided to city banks was used as a proxy for the average guidance to all banks. Explanatory variables were lagged four quarters. The lag structure matches the one-year forecast horizon implicit in BOJ window guidance.³ Lagged dependent variables were added to allow for partial adjustment of instruments to targets.

Column one reports the results of using the natural log form of the reaction function for BOJ loans ($LOAN_{boj}$). The results are consistent with the view that the BOJ was targeting all bank loans ($LOAN$). As expected, the BOJ reduced lending

³ $WG \equiv [(LOANS^*_t - LOANS_{t-1}) - (LOANS_{t-4} - LOANS_{t-5})] / (LOANS_{t-4} - LOANS_{t-5})$ where $LOANS^*$ is the BOJ's loan target for bank loans.

when bank loans expanded beyond the target level (assumed to be constant). It also reduced lending when long-run (nominal) GNP increased beyond the desired level. The current account share of GNP (CASHARE), another long-run target, entered with a positive sign, but was insignificant by normal standards. The natural log of broad money (M2CD) was positive and highly significant. As long as bank loans and GNP stayed within target ranges, the BOJ was willing to accommodate money expansion.

The dependent variable in column two is window guidance (WG) to city banks. Although WG was in effect over the entire period, our WG data begins in 1964:1. WG was expressed as a percentage change in net loan volume from the matching period in the previous year. Regression results are for periods of active guidance only. As expected, bank loan growth entered with a negative and significant sign. The BOJ imposed lending restrictions whenever aggregate bank loans exceeded target levels.

Only one other potential target/indicator entered with a significant sign. The regression results suggest that the BOJ increased the growth targets for bank loans when the (seasonal) rate of change of land prices ($\Delta_4 P_{\text{land}}/P_{\text{land}}$) was positive. Clearly, the BOJ was not targeting land prices during this period. Since land provided collateral for bank loans, the BOJ may have been willing to tolerate more credit expansion when the collateral values of bank loans were increasing. Also, the rate of growth of land prices may be an indicator of market expectations of future economic conditions.

III. Liberalization Period (ca. 1971-89)

The financial control system in place at the end of World War II and maintained through the high growth period had four main pillars. These were capital controls, interest rate controls, product restrictions, and market segmentation. From the early 1970s onward, these pillars were slowly and steadily eroded.

The breakdown of the Bretton Woods system began the process of financial liberalization as exchange rate movements became subject to the whims of the market and foreign politics. This first “Nixon shock” provided U.S. policy makers a lever to pry open Japan’s financial markets. Other global pressures included the growth of world trade, the computer and information technology revolution, the Euromarket phenomenon, and the collapse of the Soviet system. Japan’s ballooning current account surplus led to increasing international frictions and helped to drive the liberalization process.

The main domestic catalyst for liberalization was the large budget deficits of the 1970s. These deficits resulted when the 1970s growth slowdown failed to provide enough tax revenues to support Prime Minister Tanaka’s ambitious public spending program. The deficits were greatly exacerbated by the two oil shocks of the 1970s. The large deficits were more than the controlled interest rate regime could bear. The control regime, which relied upon the willingness of banks to absorb government debt at below market rates, could not be sustained once the level of debt pushed banks beyond their thresholds of pain.

To foreigner market participants, the gradual liberalization process was akin to Chinese water torture. Japanese bureaucrats and politicians argued that the slow pace was necessary to avoid costly economic disruptions. Confusing matters was the fact that liberalization measures were often said to be “in principle” or subject to “customary practices.”⁴ Even when fully opened, it didn’t take market participants long to learn that the door was still firmly attached to its hinges. In 1979, for example,

⁴ Such phrases, with the implied wiggle room for Japanese bureaucrats, are a common feature of Japanese laws and regulations.

legislation authorizing the liberalization of capital flows was passed by the Diet. The fight over implementation continued until 1984 with the signing of the Yen-Dollar Accord.

The liberalization of deposit rates can be traced to the introduction of large denomination CDs in May 1979. The last phase of deposit rate liberalization was said to have been completed in 1994, but the BOJ was suspected of continuing “voluntary” guidelines for several years more (perhaps until the Asian financial crisis of 1997). Over this period many new financial products were introduced and market segmenting barriers were substantially lowered. The relaxation of bank branching and ATM restrictions reduced the MOF’s leverage in matters of informal guidance. Increased competition in the financial sector gradually weakened the effectiveness of window guidance which was formally ended in 1990. Integrating backwards over all the liberalization measures, one cannot help but be impressed at the extent of financial control during the earlier high growth era.

Japan’s real economic growth rate averaged a respectable 4.2 percent during the financial liberalization period. The rapid growth obscured fundamental problems in the financial sector. Liberalization of capital markets brought intense competition to the banking sector. As major corporations began to rely increasingly on capital markets for funding, banks had to look elsewhere for new customers and markets. Banks continued to compete aggressively to maximize loan size. Compensation of branch managers was based on their loan growth performance relative to competitors. Banks created lending companies (Jusen) in an effort to avoid remaining interest rate controls and window guidance. An increasing share of loans went to finance real estate, construction, and equity transactions. Using the logic of the “real bills doctrine,” bank management felt

they were making prudent investments. Their loans were collateralized with assets that were rising rapidly in value. By the end of the period, Japan dominated the ranks of the world's largest banks. Japanese banks were often compared favorably with Western counterparts. Few economists foresaw the crisis in the making.

Although a schematic diagram of monetary policy during the liberalization period (figure 4) suggests little change, policy implementation became increasingly complicated as liberalization progressed. The strong linkage between bank lending and the economy that characterized the earlier period was substantially weakened. With the liberalization of capital markets, central bank control over bank lending no longer guaranteed control of investment spending and the money supply. As corporations increasingly diversified their sources of funds, banks began to aggressively compete for loans in unfamiliar markets. The BOJ continued to target bank loans, but it began to look at other policy indicators as well. The broad money supply (M2CD) became an important auxiliary indicator.

With interest rate liberalization and a weakening of the bank loan channel, the call rate (R_c) became an important instrument of monetary policy.⁵ Window guidance was actively used, but its effectiveness in controlling aggregate lending and money growth probably weakened toward the end of the period (Rhodes and Yoshino, 1999). With the spread between the call rate and the discount rate remaining positive throughout the entire period, the BOJ continued to ration credit.

Rising trade frictions in the 1980s led to increasing pressure on Japan to reduce its huge current account surplus. Since domestic politics prevented liberalization of

⁵ The call rate is an overnight lending rate in the interbank money market. It is the Japanese equivalent of the U.S. Federal Funds Rate.

key sectors such as agriculture, construction, and finance, there were calls for Japan to increase imports by expansion of aggregate demand. With MOF ruling out fiscal policy due to the large budget deficits, monetary policy was viewed by Japanese policy makers as the default option. Monetary expansion, however, conflicted with the Reagan Administration's goal of yen appreciation. Following the Plaza Accord of September 1985, the yen began a rapid appreciation in spite an increase in the growth rate of Japan's broad money (M2CD). The Louvre Agreement in February 1987 sought to check the rise in the yen. Japanese monetary expansion from 1986 to 1990 fueled a dramatic rise in asset prices and bank loans. The "bubble economy" was the result of a complex interaction of domestic politics, foreign pressure, and banking behavior.

Table 2 reports the results of regressions for the liberalization period. Reaction functions were estimated for the (inverse) call rate (R_{call}), the natural log of BOJ Loans ($\ln(\text{LOAN}_{boj})$) and window guidance (WG). Monetary tightening results from an increase in the call rate (decrease in the inverse call rate), a decrease in BOJ loans, or a reduction in the growth target for bank loans (WG). Our results suggest a division of responsibility between the three instruments. The call rate (and, hence, other regulated rates) were assigned to final targets. The call rate reacted with a one-period lag to new information. BOJ loans concentrated on the gap between intermediate and final targets. Window guidance (WG) was devoted exclusively to control of bank lending (an intermediate target). BOJ loans and WG responded to events with a four quarter lag. In some cases, the response of dependent variables to various targets or indicators changed over the liberalization period. We used an interactive dummy variable (d8089) when such changes conformed to known or suspected policy changes.

Column one estimates a reaction function for the inverse call rate ($1/R_{call}$), the

BOJ's primary instrument during this period.⁶ The call rate reacted significantly to changes in all of the final targets. The call rate was raised whenever real GDP growth or inflation rose above their respective targets. A depreciation of the yen-dollar exchange rate (increase in Y_{endol}) resulted in a decrease in the call rate (increase in the inverse call rate) and a loosening of monetary policy. As expected, this variable was highly significant in a period of intense trade and capital market frictions. The current account share (CASHARE) was also significant. An increase in the current account surplus (CA) resulted in a lowering of the call rate and an indirect stimulus to imports.

Column two reports the estimated reaction function for the log of BOJ loans. Our results suggest that the current account share (CASHARE) was the primary target for BOJ loans during this period. Consistent with Suzuki (1997, pp. 228-335), we found evidence of a change in "monetary management" in the second half of the liberalization period. Broad money (M2CD) became an important intermediate target in a period of rapid monetary growth. Real GDP also became statistically significant in the post-1980 sub-period. The positive sign suggests that BOJ loans were responding passively to the expansion in the economy. Given the desire to increase imports (and reduce CASHARE), the BOJ was predisposed to accommodate increases in real GDP.

Column three reports regression results using city bank window guidance (WG) as the dependent variable. The results for WG are qualitatively the same as for the earlier period of quantitative controls. The BOJ appears to have used WG to control the growth of bank loans (LOAN). The bank tightened WG whenever bank loan growth rose above desired levels. The rate of change of land prices was also highly significant.

⁶ The inverse of the call rate ($1/R_{call}$) is commonly used in studies of money supply and demand in Japan. Our results are basically the same using the call rate, but its inverse seems to fit the data better and with less evidence of serial correlation.

Once again, the correlation between land appreciation and the BOJ's lending growth target was positive. Clearly, the BOJ was not attempting to offset the growth of land prices during the bubble period. It tolerated, in fact, substantial increases in land prices.

IV. Post-Bubble Stagnation Period (1990-2005)

During the six years of the "bubble economy" (1985-90) real GDP grew at an average annual pace of 4.9 percent. What came to define the period, however, was the rapid run-up of asset values (real estate, stocks, and collectables). Land prices in Japan's six major cities grew at a compound annual rate of 20.5 percent. With the younger generation complaining bitterly about being priced out of the housing market, the BOJ came under tremendous pressure to do something about the "bubble." In May 1989 the BOJ took action by raising the discount rate from 2.5 to 3.25 percent. With the public and politicians clamoring for further action, the BOJ raised the rate four more times until it reached a plateau of 6 percent in August 1990.

The growth of broad money (M2CD) went from 11.7 percent in 1991 to 0.6 percent in 1992. The bubble had been pricked: prices of land and equities collapsed. Although the BOJ reversed its policy course in July 1991, land prices continued to decline for 15 years. At the end of 2002, the urban land price index was back to its 1983 level. Stock prices had fallen to a 20 year low. It was not until the second half of 2005 that land prices in urban areas began to appreciate. At the end of 2005, the Nikkei 225 was still 59% below its peak in 1989:4. The bubble had turned into a black hole.

Given the magnitude of the monetary contraction, no one was surprised when the Japanese economy decelerated from 5.6 percent growth in 1990 to 2.4 percent in 1991. Concern was expressed, however, when the annual growth continued at less than one percent through 1994. When the economy registered back to back growth rates of

3.1 and 3.3 percent in 1995 and 1996, it appeared that the corner had been turned. In 1997, the year of the Asian financial crisis and several major Japanese bank failures, the economy fell back to near zero growth. From the pricking of the bubble in 1990:4 through 2005:4 the average annual GDP growth rate was only 1.4 percent.

By traditional measures, monetary policy has been expansionary throughout the long stagnation.⁷ In July 1991 the discount rate was lowered from 6 to 5.5 percent. Since that time, it has been lowered fifteen times until it achieved an unprecedented low of 0.10 percent in September 2001. Beginning in February 1999 the BOJ adopted a zero interest rate policy (ZIRP) for the call rate (R_{call}). With its preferred operating target reaching a floor, the BOJ turned its attention to the monetary base. The money base grew an average 7.8 percent in nominal terms over the period 1996 through 2001. The lowest annual rate of growth during that period was a healthy 7.3 percent in 1999. Beginning in March 2001, the BOJ adopted a “quantitative easing policy” (QEP). In 2002, the average of the monthly year-on-year growth rate of the monetary base reached a record high of 25.7 percent. It was not until the second quarter of 2006 that the BOJ reversed course and began a period of base contraction.

While the growth of narrow money (M1) has responded to the rapid growth in the monetary base, broader measures of money (M2 + CDs, M3 + CDs, and Liquidity) barely grew at all. Over the period 1996-2005, M1 growth averaged 10.2 percent. The

⁷ Depending on how and when it is measured, fiscal policy over the stagnation period can be considered strongly expansionary, mildly expansionary, neutral, or deflationary. From 1990:4 to 2005:4 the government debt to GDP ratio rose from 47 to 157 percent. During the “lost decade” of the 1990s, government expenditures grew on average by 2.6 percent. Over the entire 15 year period, government expenditures grew on average by 1.4 percent, the same growth rate as the real economy. The average growth rate of government expenditures was a negative 0.8 percent in the first five years of the Koizumi administration (2000-2005).

growth rate of M2+CDs, however, averaged only 2.8 percent. Since 1996, the money multiplier for broad money (M2CD) was nearly cut in half. Bank reserves held at the central bank rose sharply relative to ordinary deposits (“deposit money”). There was also been a dramatic portfolio shift from less liquid deposits (“quasi money” and CDs) to ordinary deposit money. With interest rates on all assets near zero, there was little reason to hold less liquid deposits.

In spite the unprecedented monetary stimulus provided by the ZIRP and QEP, the real Japanese economy continued to languish and deflation appeared on the scene. Over the period 1994-2005, the GDP deflator fell in 11 out of the 12 years and declined at an average annual rate of less than one percent. Since 1994, the CPI has fallen 8 of the 12 years and declined at an average annual rate of less than one percent.⁸ Ultra low interest rates and ultra high monetary base expansion failed to halt deflation.

The ultimate failure of Japan’s monetary policy came as a surprise. By the midpoint of the stagnation period, Japan had acquired all of the tools necessary to conduct a modern monetary policy. A schematic depiction of the BOJ’s instruments and targets (figure 5) looks very similar to that of the Federal Reserve. The one exception, perhaps, is the long laundry list of intermediate indicators. The list reflects, no doubt, the political pressures accumulating from the lengthy stagnation.

During this period, the BOJ dropped its last ties to the old quantitative control system and gained independence in 1998. Window guidance was discontinued in July 1991. The long process of interest rate liberalization was completed in 1994 with the

⁸ Is this modest deflation a sign of the *Götterdämmerung*? Many proclaim it so. Does it reflect a failure of BOJ policy? Neither of the propositions is easy to establish and both of them are outside the bounds of this paper.

freeing of demand deposit rates. On March 31, 1995 the discount rate rose above the call rate for the first time. It has remained there for most of the subsequent period. The call rate, until its dramatic decline, took center stage as a true operating instrument. The BOJ influences the call rate through buying and selling operations in the interbank markets. Open market operations (OMO) have emerged as the primary tool of monetary policy. Figure 6 provides a schematic diagram of monetary policy under the “quantitative easing policy.” With the call rate at zero, base money took on the position as de facto operating target.

Table 3 provides estimates of reaction functions for the post-bubble period. Monetary policy became very expansionary during this period as the BOJ attempted to revitalize a stagnate economy. In the early period, the primary operating instrument was the call rate (R_{call}). The adoption of the ZIRP in 1999:1 gave the call rate status as a formal operating target, but at the cost of policy impotence. The solution adopted by the BOJ was elevation of the monetary base (MB) to the status of an informal operating target under the QEP. During this period of financial and economic stress, considerable pressure was placed on the BOJ to adopt various financial and real variables as policy targets or indicators. In devising its response to the stagnation, the BOJ looked at many policy indicators. We did not find convincing evidence, however, of any tendency for the BOJ to favor any indicators/targets other than the usual final targets.

In column one the dependent variable is the (inverse) call rate. The call rate was used an instrument to stimulate domestic demand and net exports. A decline in the growth rate of real GDP provoked a decrease in the call rate. Likewise, a yen appreciation prompted a decline in the call rate. The decline in the call rate required an expansion of the monetary base (MB).

Column three is the estimated reaction function for the monetary base during the quantitative easing period. The growth rate of the monetary base moved in the opposite direction as inflation and the growth rate of real GDP. Our experiments suggest that monetary policy during this period was fixated on final targets; in particular, promoting GDP growth and eliminating deflation.

V. Conclusion

The BOJ now possesses the tools it requires to conduct a modern, market-based monetary policy. Why is it, then, that monetary policy is commonly asserted to be “broken”? The answer to this question is likely to exercise monetary economists for many years to come. It is not likely to come from staring at data and equations. Some knowledge of the institutional constraints on BOJ policy is essential.

It should be clear from this survey that many of the BOJ tools are new. Could it be that these tools were designed for a more advanced financial structure? For the market-based tools to be effective, markets and market mechanisms must be well functioning. Japan’s banking system, which performed adequately under earlier guided-market regimes, has found the transition to a market-based system difficult to manage. Compounding matters, the bursting of the financial “bubble” left the banking system burdened with large amounts of non-performing loans.⁹ With the recovery of the banking system and economy, monetary policy is set to enter a new phase. The success of the new monetary regime will depend, as in the past, on the regulatory structure.

⁹ Although bank lending rates are free “in principle,” it is questionable whether they were truly market rates in the stagnation period. During the long stagnation few transactions occurred at posted lending rates. Total loans and discounts at Domestically Licensed Banks fell by an average of 2.8 percent in each of the seven years from 1999 to 2004.

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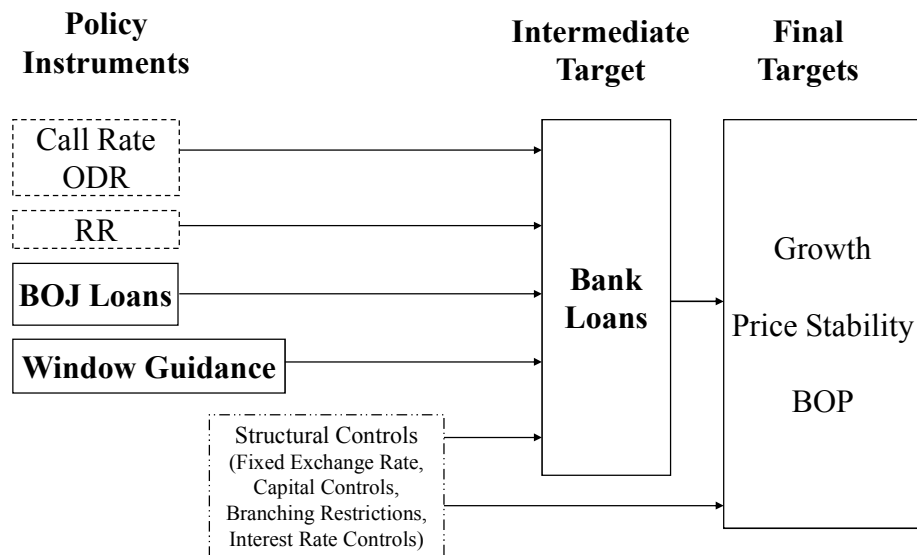
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Abbreviations:

BOJ: Bank of Japan
BG: Breusch-Godfrey (LM) Test
CASHARE: Current Account Share of GNP/GNP
CUR: Currency in Circulation
CD: Certificates of Deposit
DD: Demand-Type Deposits (“Deposit Money”)
FEMO: Foreign Exchange Market Operations
FOREX: Foreign Exchange
GDP: Gross Domestic Product
GNP: Gross National Product
IMO: Interbank Market Operations
LOAN: Loans and discounts of All Banks or Domestically Licensed Banks
LOAN_{boj}: BOJ Loans
MB: Monetary Base
M1: CUR + DD
M2CD: M2 + CD
OMO: Open Market Operations
P_{goods}: Goods Price Index (GNP or GDP deflator)
P_{land}: All Urban Land Price Index
P_{eq}: Equity Price Index (Nikkei 225)
R_{call}: Overnight Call Rate
WG: Window Guidance to City Banks
YENDOL: Yen-dollar Exchange Rate
 Δ_4 : Seasonal difference operator

FIGURE 1

Monetary Instruments & Targets
Quantitative Control Period (ca. 1955-70)



Note: The main monetary policy instruments and targets are indicated by bold letters and/or solid boxes. Dotted lines indicate other influences on target variables.

FIGURE 2
Deviation of City Bank Loans from Window Guidance

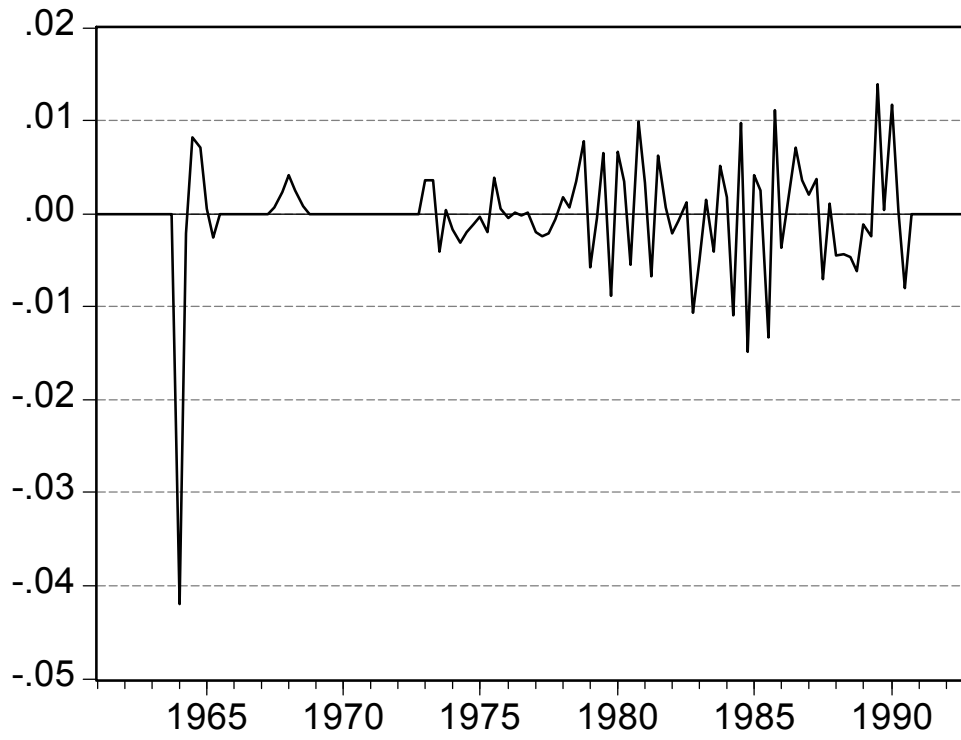


FIGURE 3
The Call Rate and City Bank Window Guidance

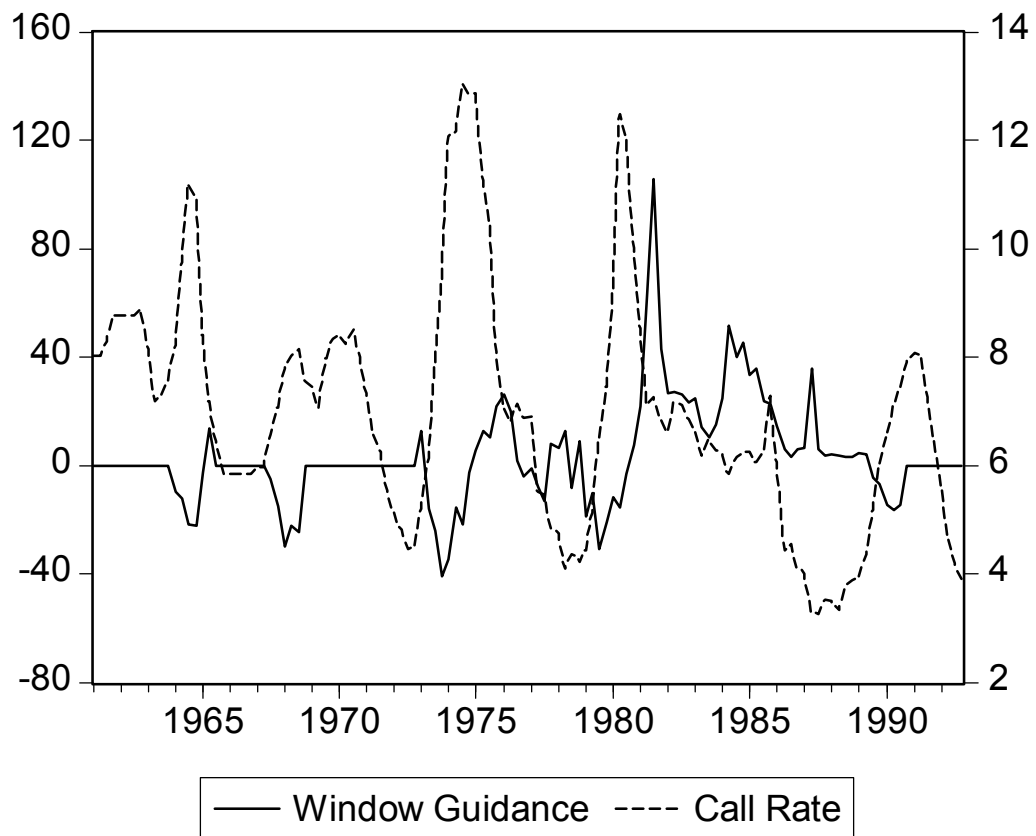


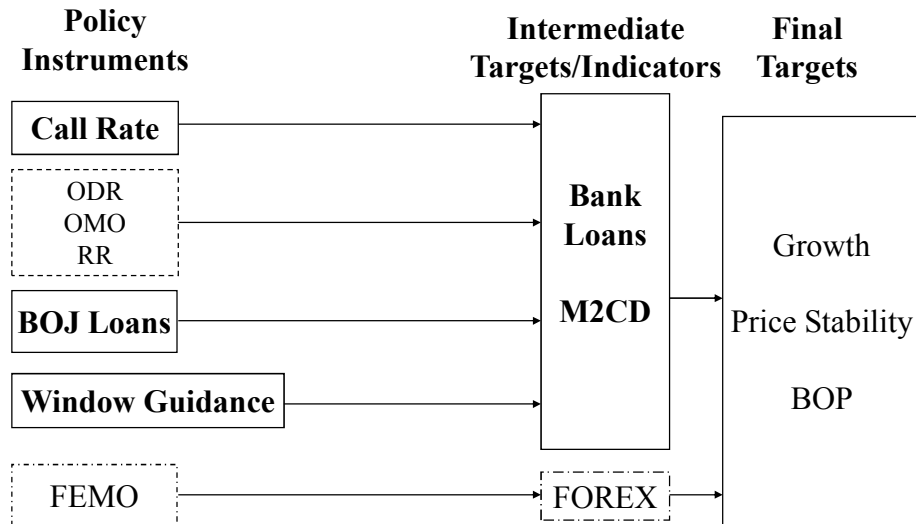
TABLE 1
Reaction Functions (Quantitative Control Period)

Explanatory Variables	Dependent Variables	
	(1) Ln(LOAN _{boj})	(2) WG
Constant	0.128 (0.339)	27.666 (1.334)
Ln(LOAN) _{t-4}	-3.598 (-4.610)***	
Ln(GNP) _{t-4}	-0.695 (-4.162)***	
Ln(M2CD) _{t-4}	4.130 (4.933)***	
Ln(LOAN _{boj}) _{t-1}	0.911 (24.062)***	
(Δ_4 LOAN/LOAN) _{t-4}		-413.570 (-2.037)*
(Δ_4 P _{land} /P _{land}) _{t-4}		419.270 (2.150)*
WG _{t-1}		0.646 (2.143)*
Adjusted R ²	0.976	0.381
BG: Prob. Chi-Square(1)	0.597	0.803
F	597.804	3.050
Sample Period (Adjusted)	1956:1—1970:4	1964:1—1968:3

Notes: t-values are in parentheses. Level of significance: ***(1%), **(5%) and *(10%).
Sources: NEEDS-Economy and BOJ

FIGURE 4

**Monetary Instruments & Targets
Liberalization Period (ca. 1971-89)**



Note: The main monetary policy instruments and targets are indicated by bold letters and/or solid boxes. Dotted lines indicate other influences on target variables.

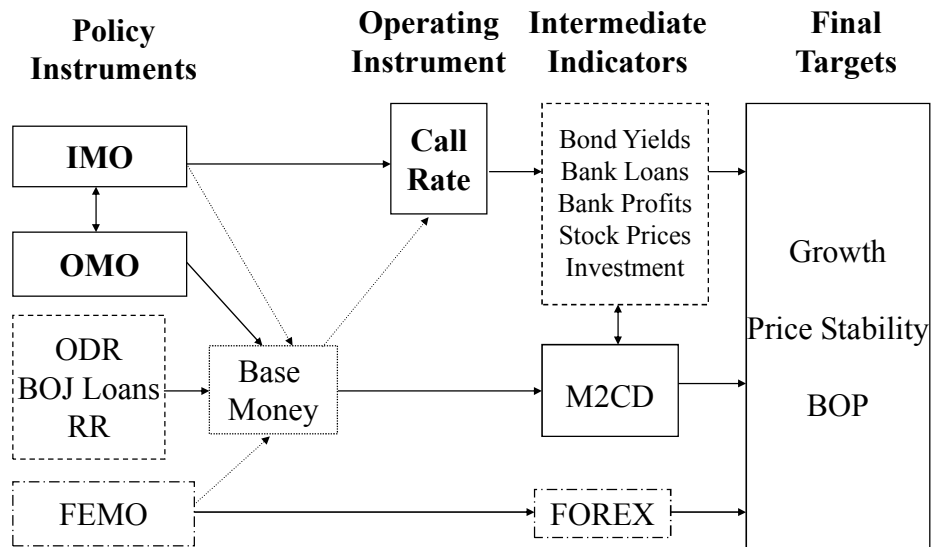
TABLE 2
Reaction Functions (Liberalization Period)

Explanatory Variables	Dependent Variables		
	(1) 1/R _{call}	(2) Ln(LOAN _{boj})	(3) WG
Constant	0.065 (5.015)***	-0.379 (-0.170)	19.369 (3.031)***
(Δ_4 RGDP/RGDP) _{t-1}	-0.437 (-3.105)***		
(Δ_4 P _{gdp} /P _{gdp}) _{t-1}	-0.221 (-2.970)***		
(CASHARE) _{t-1}	0.334 (1.747)*		
(Δ_4 Yendol/Yendol) _{t-1}	-0.081 (-4.087)***		
(Δ_4 LOAN/LOAN) _{t-1}	0.035 (0.568)		
(Δ_4 LOAN/LOAN) _{t-1} *d8089	-0.114 (-2.001)**		
(CASHARE) _{t-4}		9.120 (2.447)***	
Ln(RGDP) _{t-4}		-0.124 (-0.149)	
Ln(RGDP) _{t-4} *d8089		6.800 (5.184)***	
Ln(M2CD) _{t-4}		0.304 (1.075)**	
Ln(M2CD) _{t-4} *d8089		-3.101 (-5.224)***	
(Δ_4 LOAN/LOAN) _{t-4}			-169.305 (-3.192)***
(Δ_4 P _{land} /P _{land}) _{t-4}			62.273 (2.174)**
(1/R _{call}) _{t-1} (Col. 1)	0.752	0.683	0.662
Ln(LOAN _{boj}) _{t-1} (Col. 2)	(12.927)***	(9.279)***	(7.741)***
WG _{t-1} (Col. 3)			
Adjusted R ²	0.913	0.797	0.632
BG: Prob. Chi-Square(1)	0.427	0.789	0.787
F	111.582	45.054	39.379
Sample Period (Adjusted)	1971:2-1989:4	1971:1-1989:4	1971:1-1989:4

Notes: t-values are in parentheses. Level of significance: ***(1%), **(5%) and *(10%). Lag notation: $\Delta_4 X/X = (X_t - X_{t-4})/X_{t-4}$. Sources: NEEDS-Economy and BOJ.

FIGURE 5

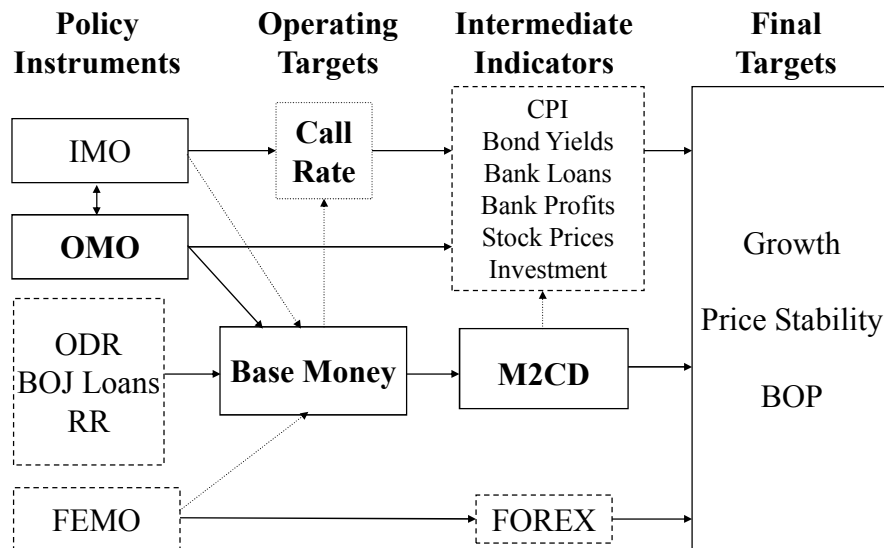
Monetary Instruments & Targets
The Lost Decade (1990-2000)



Note: The main monetary policy instruments and targets are indicated by bold letters and/or solid boxes. Dotted lines indicate other influences on target variables.

FIGURE 6

Monetary Instruments & Targets
Quantitative Easing Period (March 2001-2005)



Note: The main monetary policy instruments and targets are indicated by bold letters and/or solid boxes. Dotted lines indicate other influences on target variables.

TABLE 3
Reaction Functions (Post-Bubble Period)

Explanatory Variables	Dependent Variables	
	(1) 1/R _{call}	(2) Δ_4 MB/MB
Constant	-2.629 (-0419)	0.034 (0.959)
$(\Delta_4 P_{\text{gdp}}/P_{\text{gdp}})_{t-1}$		-5.632 (-2.234)**
$(\Delta_4 \text{RGDP}/\text{RGDP})_{t-1}$	-233.253 (-1.759)*	-3.271 (-3.959)***
$(\Delta_4 Y_{\text{endol}}/Y_{\text{endol}})_{t-1}$	-67.927 (-2.088)**	
$(\Delta_4 \text{MB}/\text{MB})_{t-1}$	202.526 (2.053)**	0.441 (3.323)***
$(1/R_{\text{call}})_{t-1}$	0.545 (4.311)***	
Adjusted R ²	0.606	0.780
BG: Prob.Chi-Square (1)	0.760	0.566
F	17.510	25.695
Sample Period	1990:1—2000:4	2001:1—2005:4

Notes: t-values are in parentheses. Level of significance: ***(1%), **(5%) and *(10%).

Sources: NEEDS-Economy and BOJ