
Financial Innovation and Monetary Policy in Japan*

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I. Introduction and Overview

The purpose of this paper is to survey the actual development of and prospects for financial innovation, its impacts on the financial system and its implications for monetary policy in Japan. The organisation and content of this paper follows that of the BIS framework paper [1]. The numbering, title and content in the sections and sub-sections that follow, except for the sub-sections in Section II, correspond to those laid out in the framework paper. This is to make international comparison easier.

The financial system in Japan has undergone remarkable structural changes since 1973-74, the years that marked the end of the era of rapid economic growth and the shift to the floating exchange rate system. These changes in the financial system have been accompanied by a steady process of financial innovation, which was initiated by large-scale issuing of government bonds and has received its largest stimulus from the increasing integration of the Japanese and international financial markets and the advance in electronics and telecommunications technology. Large-scale issues of government bonds stimulated financial innovation on the part of the securities companies, promoted the development of open markets and at the same time reduced the share in intermediation of private financial intermediaries, especially the deposit banks. As a result, financial innovation on the part of the deposit banks also began, and gradually interest rate regulations relating to the

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collection of funds were partially removed, leading to a change in the scope of the banks' financial activities. While interest rates have become more flexible, their fluctuations have not been so unpredictable as to threaten the stability of the financial system or of bank operations. This can be attributed to the fact that, firstly, interest rate fluctuations associated with uncertainty have been small because prices and other macroeconomic developments have been relatively stable since around 1976 and, secondly, some regulations on interest rates have been retained.

As financial innovation proceeded, the money-demand functions have clearly displayed structural shifts. However, these have not been so drastic as to make it unclear what the appropriate supply of money was. This may be due to the fact that financial innovation and deregulation have been proceeding only gradually. As regards the channels of transmission of monetary policy, the importance of the mechanism working through the availability of bank credit has declined; in its place mechanisms working through changes in open-market interest rates have grown in importance. In terms of both controllability and causality $M_2 + CDs$ remains a useful intermediate target. However, in the present situation, where structural changes are taking place in the financial system, close attention is also paid to other financial variables in judging what is happening in the transmission process. Furthermore, money-stock control objectives are long-term, and no attempt has been made to implement policies that lead to short-term disturbances.

II. Factors behind Financial Innovation and Structural Changes in the Financial System

The following six points are generally cited as factors behind structural changes and financial innovation. They are: (1) high, variable and unpredictable inflation and interest rates, (2) the regulatory framework and its partial revision, (3) the existing structure of the financial industry, (4) changes in the international environment and the increasing integration of domestic and international financial markets, (5) the increase in government deficits, and (6) the rapid development of technology in the financial sector. (In what follows, they will be called factors (1) (2) ... (6) respectively.) In the remainder of this section reference will be made to these six factors in explaining the causes of financial innovation and structural changes in the financial system in Japan.

1. Structural Changes in the Financial System

In the case of Japan, structural changes in the financial system began in 1974, the year that marked the end of the era of high economic growth and saw the process of

financial innovation get under way. This is obvious from the shares of the various flow-of-funds channels shown in Table 1. During the era of high growth that ended in 1973, the share of deposit banks had generally remained stable above the 60 per cent. level, while that of private financial intermediaries (of which the deposit banks are the major component) had stabilised above the 70 per cent. level. On the other hand, the share of securities markets, composed mainly of the stock and corporate bond markets, had remained below 10 per cent., except in 1970 and 1971 when there was a temporary boom. The overwhelming predominance of indirect financing over direct financing began to lessen gradually from 1974 onwards. By 1982 the share of the deposit banks had dropped to 42 per cent., and the share of private financial intermediaries as a whole had dropped to 56 per cent., despite the fact that the shares of the non-bank sectors such as the trust sector of trust banks and the insurance companies had remained constant. On the other hand, direct financing that passed through the securities market had reached nearly 15 per cent. At the same time, the share of public financial intermediaries that collect funds from postal savings and lend through public financial institutions had risen from a little under 20 per cent. to 30 per cent.

The historical developments behind such structural changes are the transition to an era of slow economic growth after the first oil crisis and increasing integration of the domestic and international financial markets accompanying the transition to the floating rate system — factor (4) cited above.

As economic growth slowed down, the public-sector deficit, which had varied cyclically between 1 and 4 per cent. of GNP, rose to 8 per cent. (factor (5)). On the other hand, the deficit of the corporate sector declined from 8 per cent. to 4 per cent. of GNP (see Graph 1). As a result, the ratio of government bonds outstanding to GNP rose rapidly and by the end of fiscal 1983 it is expected to reach 39 per cent. On the other hand, the net financial assets (gross financial assets minus liabilities) of the private non-financial sector, which had grown only slowly during the era of rapid growth and had remained at a low level equivalent to 31 per cent. of GNP at the end of 1973, rose rapidly after 1974 to reach 72 per cent. of GNP by the end of 1982.

2. Financial Innovations and their Causes

If the private non-financial sector had held its rapidly accumulating financial assets predominantly in the form of bank deposits and had held the growing amount of government bonds only indirectly through deposit banks, then the financial system that characterised the era of high economic growth, dominated by private indirect financing, would not have undergone any structural changes. However, in reality, as Table 1 shows, in the portfolio of the private non-financial sector the share of deposits declined, while that of trusts and insurance schemes remained constant and

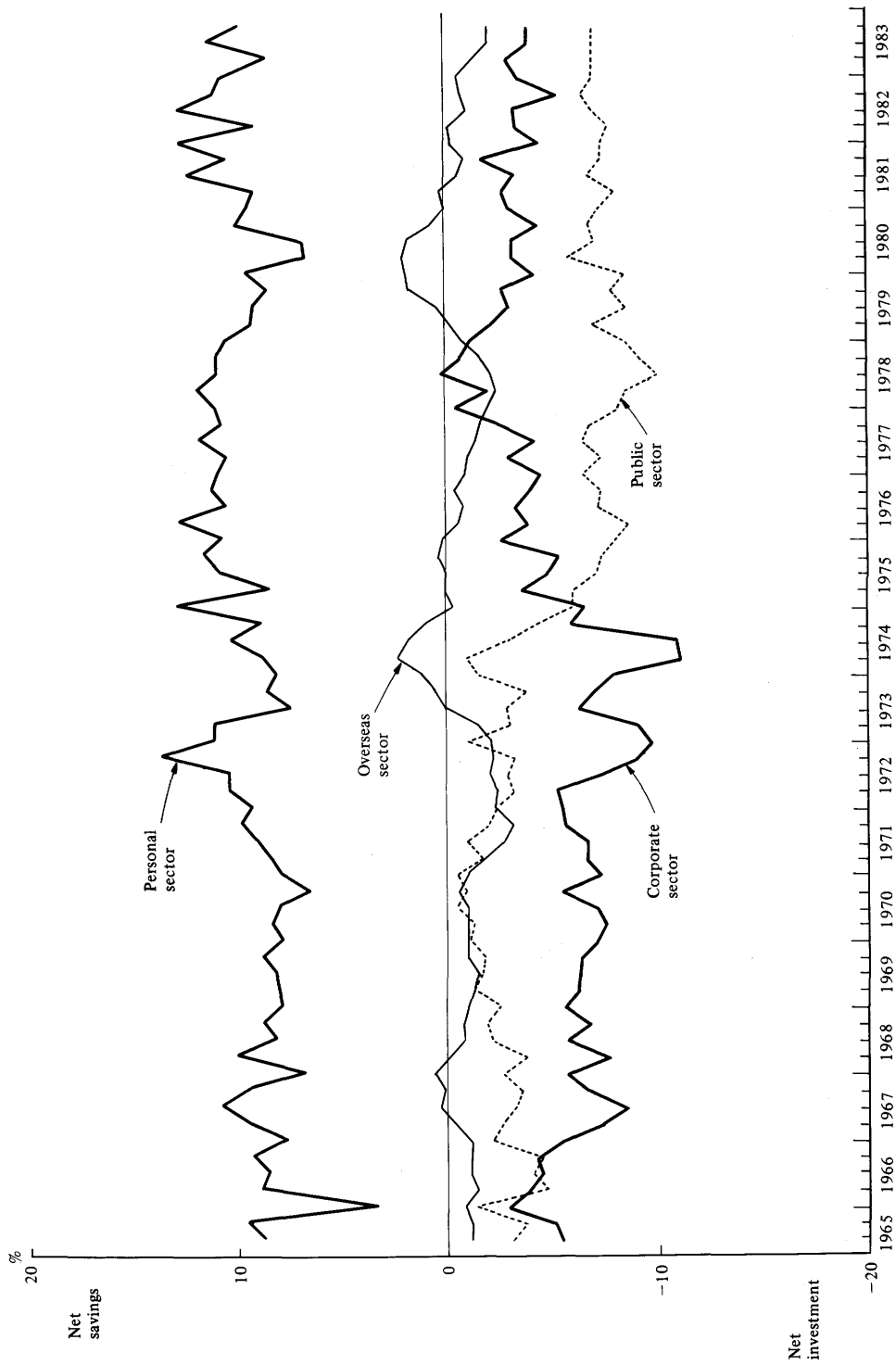
**Table 1 The Flow-of-Funds Channels from Lenders to Final Borrowers*
in the Domestic Financial System**

(As a percentage of total)

	Private financial interme- diaries	Deposit banks	Trust sector, insurance companies	Public financial interme- diaries	Securities market	Stocks	Invest- ment trusts	Total
1965	78.6	63.2	11.3	15.5	5.9	1.6	△3.0	100.0
1966	78.4	69.6	10.0	19.3	2.3	0.1	△1.7	100.0
1967	77.4	66.1	12.0	16.2	6.4	△0.5	△1.1	100.0
1968	72.5	58.3	13.0	18.4	9.1	2.5	0.2	100.0
1969	73.3	60.3	11.7	16.9	9.8	3.4	1.1	100.0
1970	71.0	60.3	12.8	16.7	12.3	4.8	0.7	100.0
1971	70.2	57.8	11.7	16.2	13.6	3.0	1.0	100.0
1972	77.5	66.2	10.5	16.1	6.4	2.6	1.5	100.0
1973	74.6	64.1	10.9	18.6	6.8	3.6	0.6	100.0
1974	69.0	58.0	10.7	21.1	9.9	2.5	0.3	100.0
1975	69.8	58.8	10.4	23.3	6.9	2.6	1.6	100.0
1976	67.4	56.0	10.2	23.7	8.9	2.5	1.0	100.0
1977	60.5	49.6	9.5	29.2	10.3	2.9	0.9	100.0
1978	62.4	54.2	6.7	25.4	12.2	2.3	0.7	100.0
1979	59.3	48.0	9.6	28.6	12.1	1.8	0.4	100.0
1980	54.9	41.9	11.6	31.2	13.9	1.0	△0.6	100.0
1981	61.4	49.8	9.9	25.5	13.1	2.7	1.9	100.0
1982	56.1	42.4	12.7	29.2	14.7	2.8	3.0	100.0

* Including the foreign sector.

Graph 1 Sectoral Net Investment (Deficit) and Net Savings (Surplus) as a Percentage of GNP



the shares of securities and postal savings rose. The causes may be summarised as follows.¹

With respect to the supply of funds, as the accumulation of financial assets accelerated and as business sales and wages levelled off when the economy entered the era of slow growth, the private non-financial sector became more sensitive to differences in interest rates received. Increasing emphasis on interest rates, when related to the following three institutional and structural conditions, led to a decline in bank deposits in investment accounts, as well as to economising on balances in transactions accounts provided by banks.

A. The Existence of Interest Rate Regulations and the Institutional Features of the Financial System

The first condition can be derived from the existence of interest rate regulations (factor (2)) and the structural characteristics of the financial system (factor (3)). The private financial intermediaries in Japan with their varied instruments for collecting funds may be classified into the following four categories:

- (a) Institutions such as city banks, local banks, mutual loan and savings banks ("Sogo") and credit associations ("Shinkin") can only provide demand deposits and time deposits at less than two years. (In 1981, "maturity-designated time deposits" at less than three years, a new type of two-year time deposit, became available. We will refer to this point again later.)
- (b) Institutions such as long-term credit banks, in addition to taking deposits, also issue bank debentures at one year and five years.
- (c) Trust banks, in addition to taking deposits, also provide money trust and loan trust facilities at two and five years.
- (d) Insurance companies provide insurance schemes.

Until last year, institutions belonging to (a)-(d) were prohibited from using funds collected to engage in securities business, except for the underwriting of public debts. (From last year (a)-(c) were permitted to sell newly issued government bonds over the counter, and from June 1984 dealing in already issued bonds was also permitted. We shall examine this point in more detail later.) Apart from these exceptions, security underwriting, dealing and brokerage have been the established business of securities companies. Separation of the banking business from the securities business in this way has been a basic principle. On the other hand, public

1. This paper only provides a brief summary of the structural changes of the financial system since 1974 and their causes. For details, see Suzuki [18].

financial intermediaries provide savings accounts at up to ten years through the Post Office.

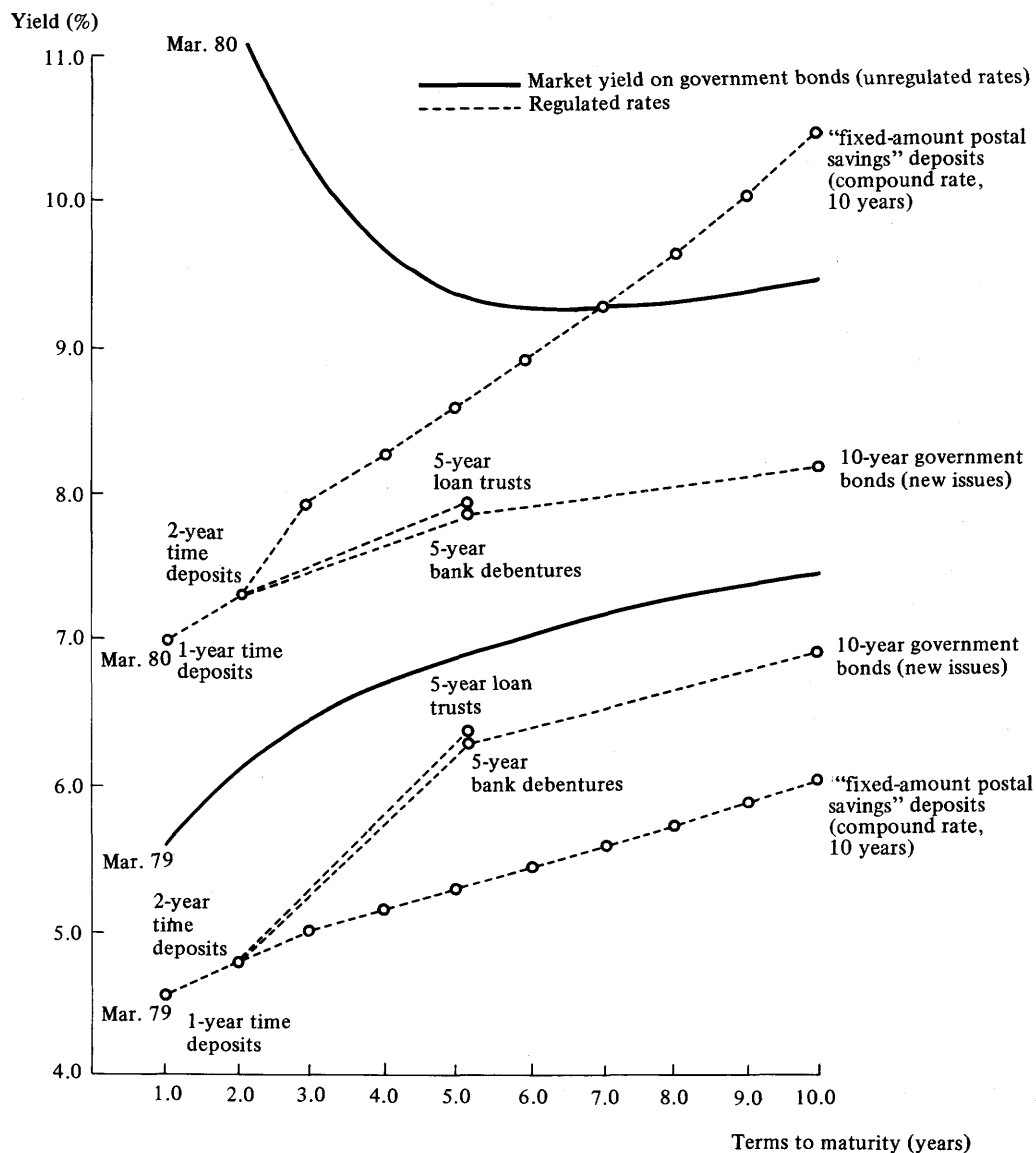
Interest rates on the above financial assets (deposits, bank debentures, money trust and loan trusts, postal savings) provided by private and public financial intermediaries and interest rates on newly issued securities (except for medium-term government bonds, which will be discussed later) are either regulated under administrative guidance or determined voluntarily in consultation with the Government. (In what follows, they will be called in a broad sense "regulated interest rates".) Graph 2 shows the yield curves for regulated and unregulated interest rates determined in the secondary market for long-term government bonds during a period of monetary ease (March 1979) and a period of monetary stringency (March 1980). Two points are worth noting. The first is that the yield curves for regulated interest rates always lie below those for unregulated interest rates, and the second is that the yield curves for regulated interest rates, including those in the monetary stringency period, are always positively sloped. These constitute the major reasons for the occurrence of the following two types of fund shift.

The first was a shift of funds from financial intermediaries to the secondary market for long-term government bonds, reflecting the differentials between regulated and unregulated interest rates. This process was promoted by a *financial innovation*. As long-term ten-year government bonds only began to be issued in 1975, secondary markets for bonds with less than one year to maturity did not exist. A Treasury bill market also failed to develop, as the interest rate on newly issued Treasury bills was controlled at a low level. In response to growing demand for short-term marketable instruments, securities companies increased their "Gensaki" transactions, which correspond to RPs in the United States. The Gensaki market had appeared in the 1960s, and it grew rapidly as the economy entered the era of slow growth, moving to the forefront of the open money market. The rapid growth of the Gensaki market was encouraged by the shift of a growing surplus of funds held by the business sector out of three-month and six-month time deposits into the Gensaki market.

The second type of shift of funds occurred within the balance sheets of the financial intermediaries. As the expectations theory of the term structure of interest rates implies, it is reasonable for yield curves to be negatively sloped in a period of tight money, when expectations of future falls in interest rates predominate. However, as shown in Graph 2, the yield curves for regulated interest rates, even in periods of monetary restraint, are always positively sloped. As a result, there is a strong tendency for funds representing mainly personal savings to shift out of time deposits at less than two years into five-year money trust, loan trusts and bank debentures and also into ten-year postal savings accounts and long-term government bonds. This shift from short-term to long-term assets is facilitated by the low

Graph 2 Yield Curves for Market Yields on Government Bonds and Regulated Interest Rates

March 1979 (easy-money period) and
March 1980 (tight-money period)



transaction costs involved. Money trust and loan trust contracts can be terminated before maturity with low penalties, and depositors have the right to withdraw funds from ten-year "fixed-amount postal saving" accounts (at zero cost) six months after making the deposit.

Besides interest rate considerations, the following institutional factor relating to trusts, insurance and postal saving accounts also contributes to this shift. As income rises, income-elastic life-insurance instalment payments show a high rate of expansion. Over time old-age pension schemes also expand rapidly as the average age of the population rises. Trust banks, life insurance companies and post offices are permitted to accept insurance and pension funds and are in a relatively advantageous position in fund collection.

B. Developments in Deregulation

The second cause of structural changes in the financial sector is the partial removal and alteration of regulations relating to interest rates and the scope of the financial activities that financial institutions are permitted to engage in (factors (2) and (3)). The move towards deregulation is a result of the following three factors:

(a) The partial deregulation of interest rates on newly issued government bonds

As the number of government bond issues grew (factor (5)), issues through underwriting syndicates at rates below market rates could no longer work smoothly. As shown in Graph 2, there has been a gap between yields in the primary and secondary markets, and interest rate negotiations between the Government and syndicates often failed to reach agreement as government bond issues expanded. As a result, in 1978 issues by public offer of 2 to 4-year medium-term government bonds and from 1982 issues by public offer at fixed rates were introduced. That is to say, interest rates in this part of the primary market for government bonds have been liberalised and are left free to be determined in the market. As these interest rates are higher than the regulated ones (for time deposits, money trust, loan trusts, etc.) with similar terms, funds representing mainly personal savings have been flowing out of financial intermediaries into the bond market.

This shift of funds was promoted by yet another *financial innovation* made by the securities companies, the introduction in 1980 of the "Chūki-Kokusai fund" (medium-term government bond fund) — a form of short-term investment trust. Because this kind of investment trust has the advantage that it can be converted into cash after one month and at the same time its interest rate is higher than that on similar bank deposits (such as deposits at notice), funds from both the personal and corporate sectors have been flowing rapidly into the investment trusts, and their size has doubled every year. This financial instrument is similar to money-market mutual

funds in the United States. In addition, securities companies began to offer other new investment trusts such as the "Rikin fund" — a form of short-term investment trust that makes use of interest derived from bonds, and medium-term (two to five years) and long-term (seven years) high-yield "Kokusai funds" (government bond funds) that make use of already issued long-term government bonds. As shown in Table 1, although the share of investment trusts in the flow of funds is very low, it grew rapidly in 1981 and 1982 for the above reasons.

In 1982, medium-term government bonds subscribed by securities companies and sold to the non-financial private sector directly or through investment trusts reached 23 per cent. of the total amount of government bonds issued. In addition, as discussed under A above, the corresponding share of long-term government bonds issued via the underwriting syndicates and underwritten by securities companies was 14 per cent. The remaining 63 per cent. was subscribed by financial intermediaries, mainly banks, but part of this was used for net sales in the Gensaki market and in the secondary market for government bonds. As far as government bonds are concerned, the financial structure in which indirect financing predominates is clearly of declining importance.

(b) The partial deregulation of banking business

As the share of deposit banks in intermediation declined, regulations imposed on banks were partly relaxed. From 1979 onwards, banks came to be permitted to issue CDs (negotiable certificates of deposit) with Yen 500 million as the minimum unit, subject to the quantitative ceiling that total issues did not exceed 10 per cent. of broadly defined net worth. Since then, the minimum unit has been lowered to Yen 300 million from Jan. 1984 and the quantitative ceiling ratio has been gradually raised to 80 per cent. by April 1984 (and it will be raised to 100 per cent. by April 1985). As a result, although banks are still subject to a quantitative ceiling, it becomes possible for them to offer large-lot deposits to enterprises at unregulated interest rates. Although interest rates on time deposits are still regulated, since 1981 banks have been allowed to offer "maturity-designated time deposits" (at up to three years). At the same time trust banks and long-term credit banks have been permitted to offer loan trusts (at up to five years) called "big" and bank debentures (at five years) called "wide". All three types of instrument offer high yields by compound interest arrangements and can easily be converted to cash before maturity. Furthermore, since 1983, banks have been allowed to sell newly issued long-term government bonds and newly issued medium-term government bonds over the counter. Deposit banks and trust banks have taken advantage of this to offer (or to plan to offer) "government bond time deposit accounts" (Kokusai-teiki-koza) or "government bond trust accounts" (Kokusai-shintaku-koza). In these accounts, newly issued

bonds are deposited by customers in banks and the interest obtained on them is automatically transferred to maturity-designated time deposit or money trust accounts at the banks and so yields compound interest. Furthermore, as from June 1984, banks were permitted to sell already issued government bonds over the counter. If similar kinds of account that make use of already issued government bonds are going to be offered, accounts which reflect unregulated interest rates in the secondary market for government bonds and which are, therefore, similar to time deposits and money trust accounts with unregulated interest rates (except that the principal is not guaranteed if the contract is terminated before maturity) would then be offered over the bank counter. The implications of these *financial innovations* are comparable to those of the introduction of money-market certificates and small savers' certificates in the United States.

(c) Deregulation of international financial business

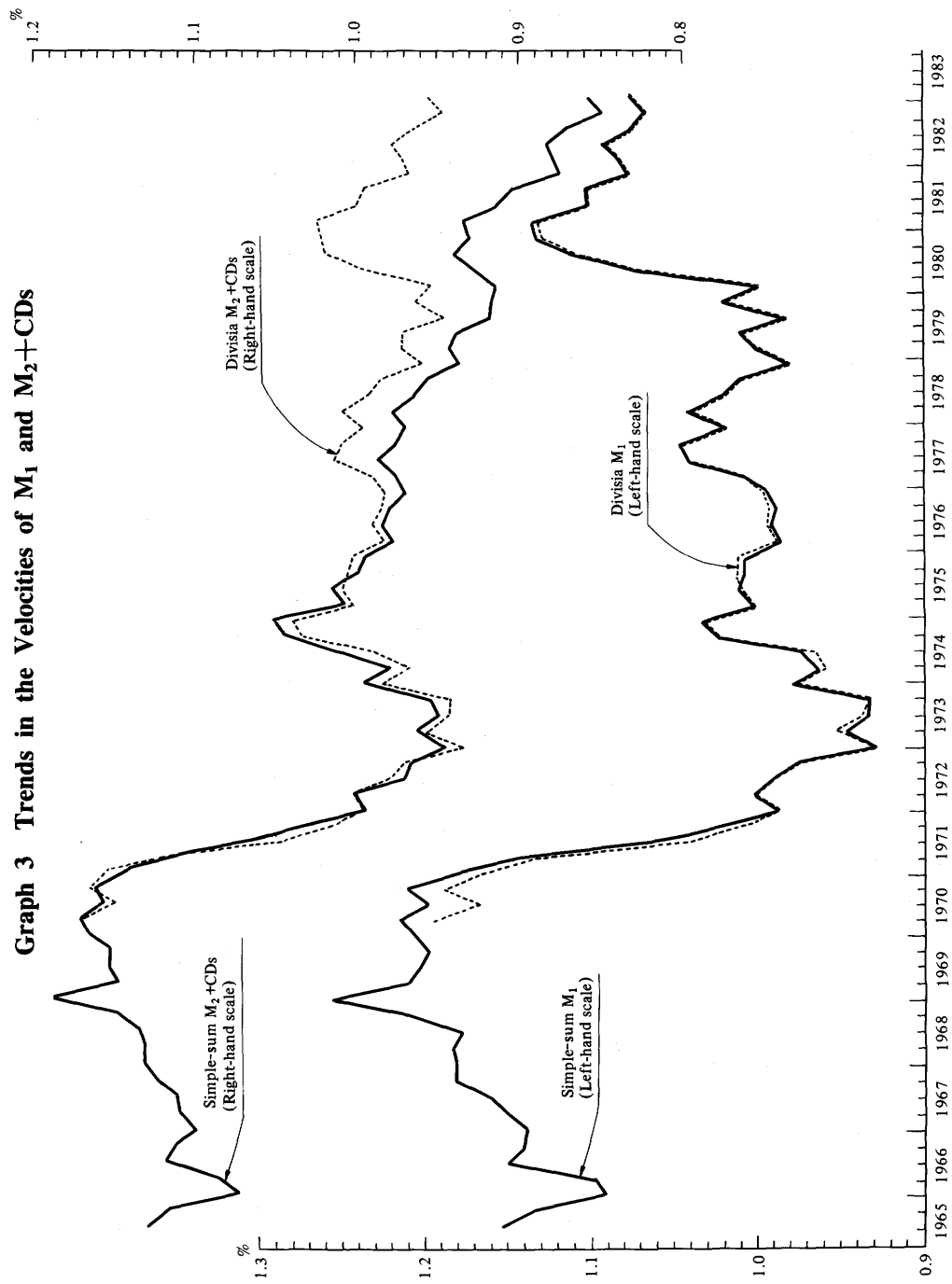
Since the transition to the floating exchange rate system in 1973 the domestic and international financial markets have become more and more integrated (factor (4)). This called for the liberalisation of domestic interest rates and financial transactions, as was then taking place in financial systems abroad. First came the liberalisation of interest rates on foreign currency deposits in 1974, which marked the first step in the deregulation of deposit interest rates in Japan. Indeed, at that time the holding of foreign currency accounts by residents required a licence. However, in 1978, holdings up to Yen 3 million were authorised, and in 1980 this ceiling was totally removed. Furthermore, borrowing by residents in foreign currencies (impact loans) from markets abroad, directly or through Japanese banks, was completely liberalised in 1980. Furthermore, when the Banking Law was revised in 1981, the principle that no regulations should be imposed on foreign banks other than those imposed on Japanese banks was made explicit and definite.

At the same time, the holding of foreign securities by residents, as well as investment in domestic securities by non-residents, was freed.

International financial transactions of this kind, as well as unregulated financial transactions in the domestic securities markets, provide impetus to the deregulation of domestic financial intermediaries.

C. The Impact of Technological Innovations

The third reason for structural financial changes is innovations in micro-electronics and telecommunications which lower the information and management costs in financial markets (factor (6)). As a result of this, financial innovation has occurred in transactions accounts, and progress has been made in economising on

Graph 3 Trends in the Velocities of M_1 and M_2 +CDs

currency and demand deposits. Since 1974, although the ratio to GNP of net financial assets of the private non-financial sector has been rising rapidly as described above, the ratio of money M_1 (cash currency and demand deposits) to GNP has shown a declining trend (see Graph 3). Clearly, this contributes to the decline in the share of banks in intermediation.

Economising on currency has been facilitated by the spread of the following practices: payment by personal credit cards, automatic depositing of monthly salaries by transfer to bank accounts (since 1969) and payment of public utility charges by automatic transfer (since 1955) — new settlement practices made possible by the development of on-line computer systems within banks — and the establishment of a system of deposit withdrawals through CDs (cash dispensers) and ATMs (automated teller machines) since 1975 — made possible by the formation of a network of on-line computer systems among banks.

On the other hand, economising on demand deposits is largely the result of the establishment of the “deposit combined account” (“Sogokoza”) in 1972. This kind of account provides for the granting of automatic overdrafts using time deposits or loan trusts as collateral whenever the balance in a demand deposit account is not enough for a certain payment. In fact, this allows the investment accounts to perform the transactions function. In essence, this corresponds to the financial instruments called NOW (negotiable order of withdrawal) or “sweep” accounts in the United States.

Although most of these financial innovations allowing economising on money balances originated before 1973 in the era of high economic growth, their rapid diffusion occurred in the period of slow economic growth after 1974 and was very much facilitated by increasing sensitivity to interest rates and by technological innovations in electronics, as discussed above.

3. Summary

A characteristic feature of the changes in the financial structure and financial innovations in Japan is that they were induced by the large-scale issue of government bonds (factor (5)). However, this alone is not sufficient to account for all such changes. Given the regulation of interest rates since the era of rapid economic growth (factor (2)) and a financial system characterised by the predominance of indirect financing encouraged by the regulations (factor (3)), government bonds issued in large quantities had come to occupy a large portion of the banks' portfolios. As their funding positions had tightened, banks came to be allowed by the Government to resell the bonds, and as a consequence a secondary market for government bonds began to develop. First of all, this led to financial innovation on the part of the securities companies (Gensaki) and a decline in the share of deposit banks in intermediation. Consequently, banking regulations relating to interest rates and the

Table 2 List of Financial Instruments Available to Various Sectors

	Sources of Funds										Uses of Funds	
	Banks			Non-bank financial institutions				Enter-prises	House-holds		Enter-prises	House-holds
	Deposit banks	Long-term credit banks		Trust sector	Insurance companies	Securities companies						
Instruments with unregulated rates	Non-resident yen deposits, foreign currency deposits	○	○								○	○
	Call money, commercial bills sold	○	○	○		○						
	Negotiable certificates of deposit	○	○								○	
	Gensaki	○	○	○	○	○		○			○	
	Investment trusts (except medium-term government bond funds)					○					○	○
	Medium-term government bonds										○	○
	Borrowings in foreign currency	○	○	○	○	○		○	○			
	Overseas bond issues	○	○			○		○				
	Foreign securities										○	○
	Borrowings from banks								○			
Instruments with regulated rates	Deposits	○	○								○	○
	Postal savings											○
	Medium-term government bond funds					○					○	○
	Money trust, loan trusts			○							○	○
	Bank debentures		○								○	○
	Short-term government securities										○	○
	Long-term government bonds*										○	○
	Corporate bonds							○			○	○
Others	Borrowings from banks (with prime rates)											
	Insurance schemes							○			○	○
	Stocks	○	○	○	○	○					○	○

* Including discount government bonds, local-government bonds and government-guaranteed bonds

scope of financial business came to be partially relaxed. In turn, this induced financial innovation on the part of the banks, and now there is a good deal of competition between banks and securities companies. In addition, factors fostering this tendency, such as (i) an acceleration in the accumulation of financial assets and increasing sensitivity to interest rate among enterprises and individuals as economic growth slowed down, (ii) a need for liberalisation perceived as domestic and foreign financial markets became more and more integrated (factor (4)) and (iii) technological innovations in micro-electronics and telecommunications should not be neglected. In the case of Japan, however, rates of inflation and interest rates showed disruptive fluctuations only in a short period around 1974, and factor (1) is, therefore, not the main cause of changes in the financial system and financial innovation.

III. Major Changes in the Banking System and Financial Markets

1. Liability Management

Table 2 shows the fund-raising instruments available to the banks, non-bank financial institutions, enterprises and households and the instruments available to enterprises and households for investment, with instruments classified into those with unregulated rates and those with regulated rates. Instruments with unregulated interest rates have increased considerably in number. However, in the case of Japan, as financial innovations and the partial deregulation of interest rates have been proceeding only gradually, interest rates on deposits which have the largest weight in the liabilities of financial institutions remain regulated, except for interest rates on foreign currency deposits and those on CDs in minimum denominations of Yen 500 million subject to a quantitative ceiling (from Jan. 1984, minimum denominations have been lowered to Yen 300 million). Consequently, the ratio of liabilities with unregulated interest rates to total liabilities of financial institutions at the end of 1982 was only 15.2 per cent. (see Table 3). At the end of 1982 CDs and foreign currency deposits, which are the liabilities of financial institutions with unregulated rates, together made up only 4.8 per cent. of the total financial assets held by the non-financial corporate sector. The same ratio for the personal sector was below 1 per cent. In the case of the personal sector the shares of "maturity-designated time deposits", "big" (loan trusts) and "wide" (bank debentures), all of which have high yields owing to their compound interest features, and government bonds have been increasing, and by the end of 1982 they together amounted to 12.5 per cent. of total financial asset holdings.

Therefore, with respect to the domestic business of Japanese financial institutions, complications in liability management arising from interest rate

Table 3 Composition of Funds Raised by Private Banking Sector

(in percentages)

As at end of year	Instruments with regulated rates broadly defined		Instruments with unregulated rates			Call money, bills sold	CDs	Gensaki	Foreign currency deposits, non-resident yen deposits	Debentures in foreign currency	Short-term foreign liabilities	Total funds raised (A+B)
	Total (A)	Deposits	Bank debentures	Borrowing from BOJ	Total (B)							
1965	96.0	83.4	8.9	3.7	4.0	3.1	0	0	0.9	0	—	100.0
1966	96.9	84.0	9.2	3.8	3.1	2.4	0	0	0.7	0	—	100.0
1967	96.6	84.4	9.4	2.9	3.4	2.8	0	0	0.6	0	—	100.0
1968	97.3	85.0	9.4	2.9	2.7	2.2	0	0	0.6	0	—	100.0
1969	96.9	84.9	9.0	3.0	3.1	2.6	0	0	0.5	0	—	100.0
1970	93.8	82.1	8.6	3.1	6.2	2.9	0	0	0.5	0	2.8	100.0
1971	93.8	84.5	8.6	0.7	6.2	2.2	0	0	1.2	0	2.7	100.0
1972	93.3	82.8	8.5	1.9	6.7	2.6	0	0	1.8	0	2.3	100.0
1973	91.1	80.9	8.4	1.7	8.9	4.4	0	0	1.7	0	2.9	100.0
1974	88.3	78.7	8.5	1.1	11.7	5.3	0	0	1.6	0	4.9	100.0
1975	89.7	79.8	8.9	1.0	10.3	4.1	0	0	1.6	0	4.6	100.0
1976	90.2	80.2	9.0	1.0	9.8	4.0	0	0	1.5	0.1	4.2	100.0
1977	91.0	80.8	9.2	1.0	9.0	4.1	0	0.2	1.7	0.1	3.0	100.0
1978	90.9	80.7	9.1	1.0	9.1	3.7	0	0.3	2.0	0.1	2.9	100.0
1979	88.9	79.3	8.8	0.7	11.1	3.8	0.6	0.4	1.7	0.1	4.4	100.0
1980	87.0	77.6	8.6	0.7	13.0	3.8	0.8	0.4	2.7	0.1	5.3	100.0
1981	85.8	76.9	8.4	0.4	14.2	3.5	1.0	0.3	2.9	0	6.6	100.0
1982	84.8	75.7	8.6	0.5	15.2	4.2	1.1	0.3	3.1	0	6.5	100.0

fluctuations are only a prospective problem for the future. At present, the pressing problem with regard to their management of liabilities is how to handle complicated operations such as payment transfers, settlements, overdrafts, interest payments, maturity management and withdrawal of placements before maturity, etc. Since liabilities offering special facilities such as "deposit combined accounts", "maturity-designated time deposits", "big" loan trusts, "wide" bank debentures, "government bond time deposit accounts" and "government bond trust accounts", etc. expand in the process of financial innovation, efficient use of computers and transmission of information among terminals are required.

2. Variable Rate Lending and Length of Debt Maturities

In Japan there are no precise statistics on variable rate lending. In the case of ordinary lending, lending with terms shorter than one year can be considered to be a kind of variable rate lending, since interest rates can be changed as commercial bills mature (usually in 3 or 6 months). Similarly, with the exception of lending by long-term credit banks which charge fixed interest rates, interest rates on long-term lending (at terms longer than one year) may also be changed at the time of each interest payment (usually every 3 or 6 months). Table 4 shows the changing composition of loans by term and by type of bank over time. As is clear from this table, the share of long-term lending by long-term credit banks at fixed interest rates (centring on a 5-year term) has been declining since 1978, and by the end of 1982 it came to 9.5 per cent. of total lending (24 per cent. of lending at terms longer than one year). Furthermore, of the variable rate lending, the total share of which is growing, the component at terms longer than one year (centring on a 3 to 4-year term) is also increasing.

At the same time, interest rates charged on housing loans, a special kind of long-term fixed interest lending, have come to be fixed at different levels by different categories of banks, which reflects differentials in the costs of raising funds. When 25 to 30-year loans with provisions for repayment by the borrower's children in the event of the borrower's death started in 1983, variable interest rates were introduced.

While, as we have seen above, in the case of banks in Japan, variable interest rate lending has been increasing gradually, the term to maturity has not been shortening as it has been in some other countries, and the share of loans at 3 to 4 years is increasing.

Turning now to the deposit side, the share of demand deposits has been declining, reflecting financial innovations such as "deposit combined accounts" (on offer since 1972), which permit economising on money balances, while that of time deposits and deposits with unregulated interest rates (CDs, foreign currency deposits and non-resident yen deposits) has been rising. Within the time deposits category,

Table 4 Term Composition of Bank Lending and Deposits

End - March	Lendings			Deposits					With unregulated rates**
	Under 1 year	Over 1 year	Long-term credit banks	With regulated rates					
				Demand deposits	Time deposits	3-month	6-month		
								Maturity-designated, instalment time deposits*	
1965	80.7	19.3	10.5	50.3	49.7	3.6	5.4	40.7	n.a.
1966	79.7	20.3	10.8	49.5	50.5	3.5	5.2	41.8	n.a.
1967	79.8	20.2	10.8	47.3	52.7	3.5	5.1	44.1	n.a.
1968	78.9	21.1	11.2	45.8	54.2	3.6	4.8	45.8	n.a.
1969	77.6	22.4	11.2	45.6	54.4	3.5	4.7	46.1	n.a.
1970	75.9	24.1	11.2	45.9	54.1	3.6	4.8	45.8	n.a.
1971	74.9	25.1	11.2	45.9	54.1	3.3	4.1	46.6	n.a.
1972	70.3	29.7	11.6	44.2	53.3	3.0	5.7	44.6	2.4
1973	67.4	32.6	11.2	44.0	52.0	3.3	5.0	43.7	4.0
1974	64.9	35.1	11.2	43.5	52.2	2.6	5.5	44.0	4.4
1975	63.8	36.2	11.3	41.8	52.8	2.2	6.0	44.6	5.4
1976	61.8	38.2	11.4	41.4	52.9	2.1	4.7	46.2	5.6
1977	61.8	38.2	11.3	40.6	54.0	2.0	4.1	47.9	5.4
1978	62.0	38.0	10.6	38.8	55.4	2.1	4.5	48.8	5.8
1979	59.9	40.1	10.1	37.9	55.1	2.3	4.7	48.2	6.9
1980	58.9	41.1	10.4	36.7	55.1	2.4	4.0	48.7	8.3
1981	59.2	40.8	10.2	33.1	57.3	1.7	3.1	52.5	9.6
1982	58.9	41.1	9.9	29.7	56.8	1.7	3.0	52.1	13.6
1983	60.7	39.3	9.5	30.5	56.6	1.7	3.0	51.8	12.9

* Maturity-designated time deposits (terms less than 3 years) were established in June 1981.

** Share of deposits with unregulated rates as sum of share of CDs, foreign currency deposits and non-resident yen deposits.

the share of longer-term (one and two-year) deposits has been rising, while that of 3-month and 6-month deposits has been declining. 3-month and 6-month time deposits are held mainly by enterprises and the decline in their share reflects a shift of funds towards deposits with unregulated interest rates and the Gensaki market. In sum, the term to maturity of the liabilities of Japanese banks also fails to show any clear tendency towards a shortening such as has occurred in some other countries.

There are two reasons why a shortening of the maturity of assets and liabilities of Japanese banks has not occurred as it has in some other countries. One is that, as explained in Section II with the aid of Graph 2, yield curves for regulated interest rates, including deposit interest rates, are always positively sloped, with the result that customers prefer longer-term assets and a shortening of the maturities of deposits does not take place. As a result, banks have no incentive to shorten the terms to maturity of their lending so as to match changes in the maturity of their liabilities. The second reason is that, since around 1977, prices have remained generally stable in Japan and unpredictable random fluctuations in interest rates have been rare, and there is, therefore, little incentive to shorten the terms of both assets and liabilities as a form of risk avoidance on the part of financial institutions and other enterprises. Even in these circumstances, however, the share of variable rate lending has increased against the background of a deregulation of interest rates and more frequent changes in regulated rates.

3. The Development of New Financial Markets

Among the new financial instruments born in the period of financial innovation, it is the Gensaki and the CD that have developed their own markets. However, in the case of Japan, instead of eroding the share of other similar markets already in existence, the new markets expanded the previously almost non-existent open money market. An interbank money market has long existed in Japan, and a comparison between the shares of the different markets is shown in Table 5. At the end of 1982, the Gensaki and CD markets together amounted to 46.6 per cent. of the money market as a whole.

Of these markets, the Gensaki market plays an important rôle in raising the share of direct financing in the Japanese financial system, as discussed in Section II. The formation of open money markets in the guise of the Gensaki and CD markets has added two channels through which the effects of monetary policy are transmitted, as we shall see in Section IV-3.

Since in Japan volatile and unpredictable fluctuations in interest rates are rare, there is no pressing need for the establishment of financial futures markets, at least at the present moment.

Table 5 Trends in Money-Market Transactions

(in billions of yen; percentage share in brackets)

	Call money market		Commercial bills discount market		Gensaki market		CDs market		Total	
		Share		Share		Share		Share		Share
1965	809	100.0							809	100.0
1966	747	100.0							747	100.0
1967	1,012	86.9			152	13.1			1,164	100.0
1968	985	77.2			291	22.8			1,276	100.0
1969	1,546	79.1			408	20.9			1,954	100.0
1970	1,817	74.6			619	25.4			2,436	100.0
1971	1,472	54.1	369	13.5	882	32.4			2,723	100.0
1972	1,048	25.8	1,792	44.1	1,224	30.1			4,065	100.0
1973	1,227	17.4	4,089	58.0	1,738	24.6			7,053	100.0
1974	2,160	23.9	5,207	57.6	1,673	18.5			9,039	100.0
1975	2,332	27.2	4,403	51.4	1,835	21.4			8,570	100.0
1976	2,567	26.3	5,091	52.3	2,089	21.4			9,742	100.0
1977	2,616	22.7	6,084	51.4	3,136	26.5			11,837	100.0
1978	2,326	17.7	6,590	50.2	4,207	32.1			13,123	100.0
1979	3,473	22.3	6,327	40.6	3,960	25.4	1,820	11.7	15,580	100.0
1980	4,133	24.7	5,738	34.3	4,507	26.9	2,358	14.1	16,736	100.0
1981	4,699	28.5	4,016	24.3	4,481	27.2	3,291	20.0	16,486	100.0
1982	4,494	24.2	5,413	29.2	4,304	23.2	4,342	23.4	18,551	100.0
1983	4,456	21.0	6,763	31.9	4,288	20.3	5,665	26.8	21,172	100.0

4. The Development of Retail Banking Services

The development of retail banking services will be discussed by examining in turn the development of services for economising on cash and the development of services for economising on demand deposits.

Looking first at cash-saving services for individuals, payment of salaries through bank remittances started in 1969. According to a survey conducted in June 1981, 42.6 per cent. of all payrolls of enterprise customers of city banks were remitted directly to individuals' deposit accounts. On the expenditure side, a system of direct mailing of bills for telephone, electricity and water supplies as well as for social security contributions and taxes, and of automatic transfers from individuals' deposit accounts started in 1955 and is now widespread. In addition, the practice of using the consumer credit associated with credit cards, with automatic settlement subsequently through deposit accounts, has also become popular to a certain extent. According to 1981 figures, 8.6 per cent. of the final consumption expenditure of the household sector involves the use of sales credit such as that provided through credit cards. Also, the withdrawing and depositing of cash through automatic machines rapidly became widespread following the introduction of CDs (cash dispensers) in 1969 and ATMs (automated teller machines) in 1979. The position as at September 1982 is shown in Table 6: the number of such machines installed had reached 26,000 and their diffusion among city banks was close to 100 per cent. Furthermore, since 1980 various financial institutions have linked their integrated on-line system to those of others, thus establishing system for withdrawing cash from deposits through the CDs and ATMs of other institutions. At present there are five such systems with 610 member financial institutions and customers are free to draw cash from CDs and ATMs of other institutions belonging to the same system.

The Nippon Telegraph and Telephone Public Corporation has planned and started the construction of an Information Network System (INS) which can link all economic agents such as enterprises and households through composite facilities for the transmission of information making use of optical fibre cables. In 1984 it will provide services in certain regions on an experimental basis, and from 1985 onwards it will be gradually put into widespread operation. INS will link on-line systems (or terminal units) of banks and customers. This will encourage "firm banking", which is only in limited use today, and it is also expected that "home banking" will become a reality in the future.

Economising on demand deposits has been facilitated by the establishment in 1972 of "deposit combined accounts", as discussed in Section II. Theoretically, with deposit combined accounts, settlement can now be made with zero balances on demand deposit accounts. As the interest rate on overdrafts is 0.25 per cent. higher than that on the time deposits and loan trusts which serve as collateral, the effective

**Table 6 CDs and ATMs Installed by Banks
(September, 1982)**

	Number of bank offices with CDs or ATMs installed	Diffusion rate (%)	Number of CDs and ATMs installed
City banks	2,821	99.8	9,813
Local banks	5,117	85.6	8,611
Sogo banks	2,957	73.3	3,952
Shinkin banks	3,302	56.1	3,770
Credit Co-operatives	150	5.7	152

Diffusion rate = number of bank offices with CDs or ATMs installed / total number of bank offices.

cost of zero balances is 0.25 per cent. In March 1983, 15 per cent. of all time deposits served as collateral in deposit combined accounts. In this sense, time deposits can potentially perform the function of transactions accounts.

With the development of the retail banking services described above, it is theoretically possible to avoid holding any cash or demand deposit balance. Indeed, as will be discussed in connection with Graph 3 in Section IV, the velocity of M_1 has been increasing. However, it would prove troublesome to draw cash from CDs or ATMs every time a payment by credit card was not accepted. As long as these transaction costs exist, a world with zero money balances remains a vision of the remote future.

5. The Supply of Financial Services

In Japan, as elsewhere, one can observe tendencies for the distinction between services provided by banks and securities companies to become less clear as they expand into each other's domains and for industries on the financial fringe to expand into financial business.

Firstly, banks were permitted to sell newly issued medium and long-term government bonds over the counter from 1983, and over-the-counter sales of already issued government bonds were also permitted as from 1984. At this point, at least with respect to government bonds, there is no longer a difference between the financial services provided by banks and securities companies. Also, as banks were in

the past not allowed to engage in the credit-card business, they set up independent credit-card companies jointly with their non-bank affiliates in order to circumvent this regulation. However, as credit-card operations were approved as part of banking business in 1981's revision of the Banking Law, banks will in future provide credit-card services of their own. By combining the cash withdrawal and credit facilities in a single card issued to each depositor, banks can provide a variety of services with a single card, such as withdrawing and depositing, repayment of consumer credits, and loans. In this way, banks can compete with consumer credit companies and small consumer finance companies ("Sarakin") and improve their services in the field of consumer finance.

Secondly, turning to the rôle of securities companies, the establishment of "medium-term government bond funds" (described in Section II-2-B(2)) means that securities companies in fact offer a type of demand deposits, in the sense that customers are free to draw funds from their accounts at the companies one month after depositing them. In addition, some securities company added a transaction function to the "medium-term government bond funds" via coordination with a credit association offering demand deposits. In addition, investment trusts that incorporate government bonds in the primary as well as in the secondary market have essentially the same properties as time deposits, with the exception that the principal is not guaranteed if contracts are terminated before maturity. In addition, while lending secured by the deposit of government bonds can be provided on a case-by-case basis within certain limits, securities companies are requesting the authority to introduce a more useful loan facility by providing a general credit line against collateral of government bonds. At a time when banks are planning to establish deposit combined accounts secured by government bonds and credit companies and large supermarkets are expanding into the field of consumer finance (to be discussed next), it is probably impossible permanently to maintain strict regulations on securities companies' loans to individuals secured by government bonds. Furthermore, securities companies recently began to provide clients (investors) with on-line information about stocks and bonds. Although this facility is at present limited to the provision of information, it is expected that in future it will be linked with on-line computer systems for making transactions (so-called "firm dealing").

As regards the participation of fringe industries in the provision of financial services, it may be noted that in the last few years consumer credit companies, small consumer finance companies and large supermarkets have been expanding rapidly in the field of small-scale consumer finance. This rapid expansion is encouraged, on the one hand, by the installation of CDs and the on-line systematisation of credit information made possible by technological progress, and, on the other hand, by institutional factors: in fringe industries office locations and interest rates offered are

either only loosely regulated or are totally free of control, in contrast to the position for traditional financial institutions. In the last twelve months the business of small-scale consumer finance companies has been expanding rapidly in terms of both the number of offices and the amount of loans outstanding.

IV. Implications for Monetary Policy

1. Definition of Money, Money Supply and Money Demand

In Japan M_1 is defined as cash currency plus demand deposits, M_2 as M_1 plus time deposits and M_3 as M_2 plus money trust, loan trusts and postal savings.

In Japan innovation related to transactions accounts, as discussed above, takes the form not of new financial assets but of deposit combined accounts, combining demand deposits with time deposits or loan trusts, which act as collateral for overdrafts. The establishment of new transactions accounts with high interest rates gives rise to the problem of whether to include them in the definition of M_1 or M_2 — a problem never confronted before.

With respect to investment accounts, on the other hand, various new financial assets have been introduced by financial innovation. As to whether they should be included in the definition of money or not, the traditional practice of including time deposits, money trust and loan trusts, and of excluding investment trusts and bonds is followed. That is, CDs are taken as a form of time deposits and included in the aggregates $M_2 + \text{CDs}$ or $M_3 + \text{CDs}$. Foreign currency deposits, another kind of deposit with an unregulated interest rate, are also considered as quasi-money and, therefore, included in M_2 . Among the new financial instruments with compound interest rates, maturity-designated time deposits, designed to permit generation of high yields under the interest rate regulations, are included in M_2 and loan trusts ("big") are included in M_3 . The time deposit component of "government bond time deposit accounts" is included in M_2 , while the money trust component of "government bond trust accounts" is included in M_3 . The government bond deposit component is excluded from all definitions of money. Other new instruments such as Gensaki bonds, medium-term government bonds, bank debentures with compound interest rates ("wide"), medium-term government bond funds and the various government bond funds are not included in the money stock since bonds and investment trusts are traditionally excluded from any definition of money.

With the problem of the definition of money thus resolved, it is worth noting that the demand functions for money so defined have clearly been shifted by financial innovation. Graph 3 shows the velocities of M_1 and $M_2 + \text{CDs}$ and from this it can be noted that the trends in these velocities changed in 1974, the year that marked the

beginning of structural changes and financial innovation. That is, the velocity of M_1 had been declining until 1973, and then this trend was reversed in 1974. On the other hand, the velocity of M_2 +CDs has declined consistently.

The rebound in the velocity of M_1 , as already discussed in Section II-2-C, is the result of money-saving financial innovations. The natural question to ask is why the trend in the velocity of M_2 +CDs, which has M_1 as a component, fails to show any signs of a reversal. In order to answer this question, "Divisia" monetary aggregates were estimated. This was done by first disaggregating the simple-sum monetary aggregates such as M_1 and M_2 into the component categories of deposits. Divisia M_1 and M_2 were then obtained as the weighted average of these components with the degree of moneyiness of each category as the corresponding weight.²

The velocity of the Divisia M_1 and M_2 +CDs estimates is shown in Graph 3 by dotted lines. The trends in the velocities of simple-sum M_1 and Divisia M_1 have shown the same pattern. However, the velocity of Divisia M_2 +CDs deviated from that of simple-sum M_2 +CDs in an upward direction in 1977 and has remained roughly constant since then. Therefore, the reason why the velocity of M_2 +CDs has shown a declining trend as financial innovation has proceeded is not that people hold additional money for transactions purposes, which would be inconsistent with the implications of innovation affecting transactions accounts, but rather, it is a consequence of the upward trend in components with high interest rates and a low degree of moneyiness, reflecting financial innovation affecting investment accounts. Specifically, at the end of June 1983, among the components of M_2 +CDs the share of CDs and foreign currency deposits on which the interest rates are free of regulation stood at 2.1 per cent. and 1.0 per cent. respectively, while maturity-designated time deposits, a high-yield instrument with regulated interest rates, accounted for 15.3 per cent. of total M_2 +CDs. Also, as is to be discussed later in this section, since the end of the era of high economic growth, regulated interest rates on time deposits have risen in relation to interest rates on demand deposits and changes in the former have become more frequent.

As discussed above, innovation involving transactions accounts has affected the demand for M_1 , while innovation involving investment accounts has had an impact on the demand for M_2 . Therefore, the money demand functions have shown clear

2. For studies on Divisia monetary aggregates, see Barnett [2] [3], Barnett & Spindt [4], Cockerline & Murray [5]. Here, M_1 and M_2 +CDs are broken down into five and six components respectively. The opportunity cost of holding each category of deposits is taken to correspond to its utility as money and is used as an index to measure its degree of moneyiness. As to the details for the application of "Divisia" monetary aggregates to Japan, see a separate article "Divisia Monetary Aggregates and Demand For Money: A Japanese Case" in this volume.

Table 7 Estimation Results of the Money-Demand Functions

Dependent variables	Sample period	Explanatory variables					ρ	R^2	S.E.	D.W.	$\frac{\beta_1}{1-\alpha}$	$\frac{\beta_2}{1-\alpha}$
		α	β_0	β_1	β_2	β_3						
M_1 $M_2 + CD_s$	65/3 - 73/4	.8055 (12.70)	-.1873 (.827)	.2418 (3.23)	-.0826 (3.19)	.0114 (.0910)	—	.9969	.0177	1.558	1.243	-.4247
		.7851 (19.80)	.1824 (1.96)	.2469 (5.41)	-.0784 (6.25)	.0265 (.446)	—	.9991	.0090	1.737	1.149	-.3648
M_1 $M_2 + CD_s$	74/1 - 83/1	.7051 (7.25)	1.6484 (3.11)	.1926 (2.64)	-.0176 (.879)	-.0310 (.747)	—	.9781	.0149	1.756	.653	-.0597
		.7474 (9.64)	-.9561 (3.40)	.3760 (3.41)	-.0296 (2.30)	-.0382 (1.50)	—	.9974	.0095	1.181	1.489	-.1172
M_1 $M_2 + CD_s$	74/1 - 80/1	.6129 (4.13)	.4375 (.622)	.3870 (2.49)	-.0118 (.581)	.0113 (.258)	—	.9766	.0143	1.692	1.000	-.0305
		.6338 (6.17)	-1.8982 (3.98)	.5833 (4.11)	-.0261 (2.01)	.0639 (2.28)	—	.9954	.0091	1.216	1.251	-.0713
M_1 $M_2 + CD_s$	80/2 - 83/1	.4944 (2.29)	8.5370 (1.69)	.1154 (.284)	.0339 (.435)	-.2764 (1.55)	—	.9283	.0130	2.373	.228	.0670
		.7227 (4.55)	1.4024 (.488)	.2266 (.687)	-.0194 (.536)	-.0713 (.747)	—	.9905	.0075	2.732	.817	-.0700
$M_2 + CD_s^*$	74/1 - 83/1	.7251 (8.36)	-.9501 (2.68)	.4038 (3.28)	-.0196 (1.15)	.0138 (.411)	.440	.9999	.0086	1.948	1.469	-.0713

* Autoregressive type (removed 1st order serial correlation)

structural shifts since 1974. A money demand function was estimated in the following form for the periods 1965/3 — 1973/4 and 1974/1 — 1983/1, and for the sub-periods 1974/1 — 1980/1 and 1980/2 — 1983/1:

$$\log(M/P)_t = \beta_0 + \beta_1 \log GNP(R)_t + \beta_2 \log RCALL_t + \beta_3 \log RTD_t + \alpha \log(M/P)_{t-1} + u_t$$

where M is M_1 or $M_2 + CDs$, P is the GNP deflator, $GNP(R)$ is real GNP, $RCALL$ is a weighted average of call-money rates and market rates for commercial bills, RTD is interest rates on time deposits (one year) and u is a disturbance term. M , $RCALL$, RTD are quarterly averages of monthly data. All data except for interest rates are seasonally adjusted.

The result of the estimation is shown in Table 7. In order to test the stability of these money-demand functions, a Chow test using an F-statistic is used.³ The result is shown in Table 8. As can be seen from this, there were shifts in the money-demand functions between the period ending in 1973 and that beginning in 1974, both for M_1 and $M_2 + CDs$, which are significant at the 1 per cent. level in the case of M_1 and at the 0.1 per cent. level in the case of $M_2 + CDs$. Conversely, when the same equations are estimated for the two sub-periods since 1974, with 1980/1 and 1980/2 as the dividing line, no significant structural change can be detected in either M_1 or $M_2 + CDs$ between these two sub-periods. It can, therefore, be concluded that the money-demand function shifted around 1973-74 under the influence of structural changes in the financial system and financial innovation, but that there is no evidence that further shifts have occurred in the post-1974 period.

Considering now the factors behind structural shifts in the money-demand function, the parameters in the money-demand functions before 1973 and after 1974 are compared in Table 7. The first thing to note is that in the demand function for M_1 , the income elasticity has clearly declined (with the long-run elasticity changing from 1.24 to 0.65). This is probably due to the economising on transactions balances facilitated by financial innovations. On the other hand, the significance of the call-money rate, taken as representative of market interest rates, has declined (t-values 3.2 and 0.9). The time deposit rate, which carried the wrong sign in the earlier period, carried the correct sign in the later period, with its significance also increasing somewhat (t-values 0.1 and 0.7, and in the period after 1980/2 1.6). This is probably due to the fact that, although time deposit rates are still regulated, they have become more flexible since 1979 (which will be discussed later), so that there may be multi-collinearity between time deposit rates and call-money rates. For the

3. Empirical studies of money-demand functions include Goldfeld [6] and Heller & Khan [8] for the United States and Hamada & Hayashi [7] for Japan.

Table 8 Structural Changes in the Money Demand-Functions (Chow-tests)

Test periods	Degrees of freedom	F - value	
		M_1	$M_2 + \text{CDs}$
Structural change between 65/3 – 73/4 and 74/1 – 83/1	F (5,61)	3.464*	5.818**
	level of significance	.805 %	.019 %
Structural change between 74/1 – 80/1 and 80/2 – 83/1	F (5,27)	1.158	1.868
	level of significance	35.5 %	13.3 %

* Significant at the 1% level

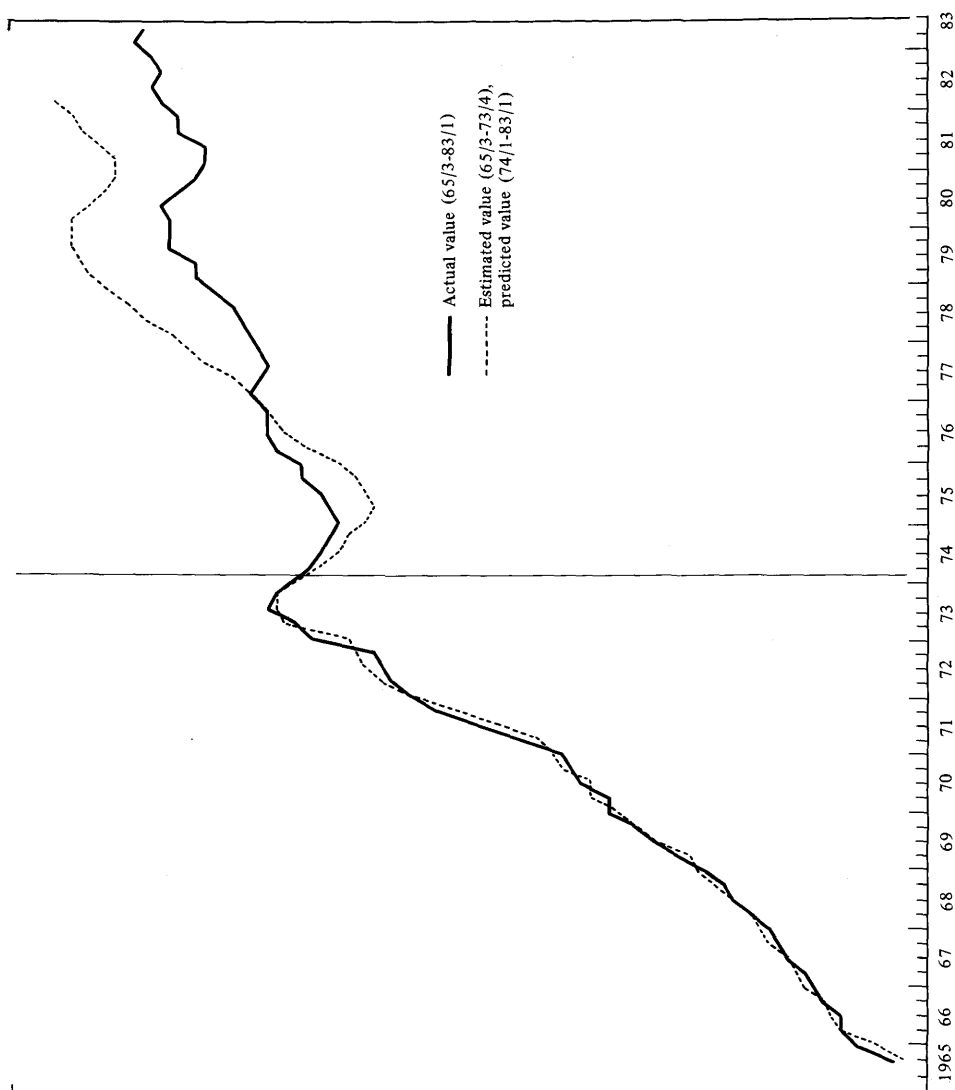
** Significant at the 0.1% level

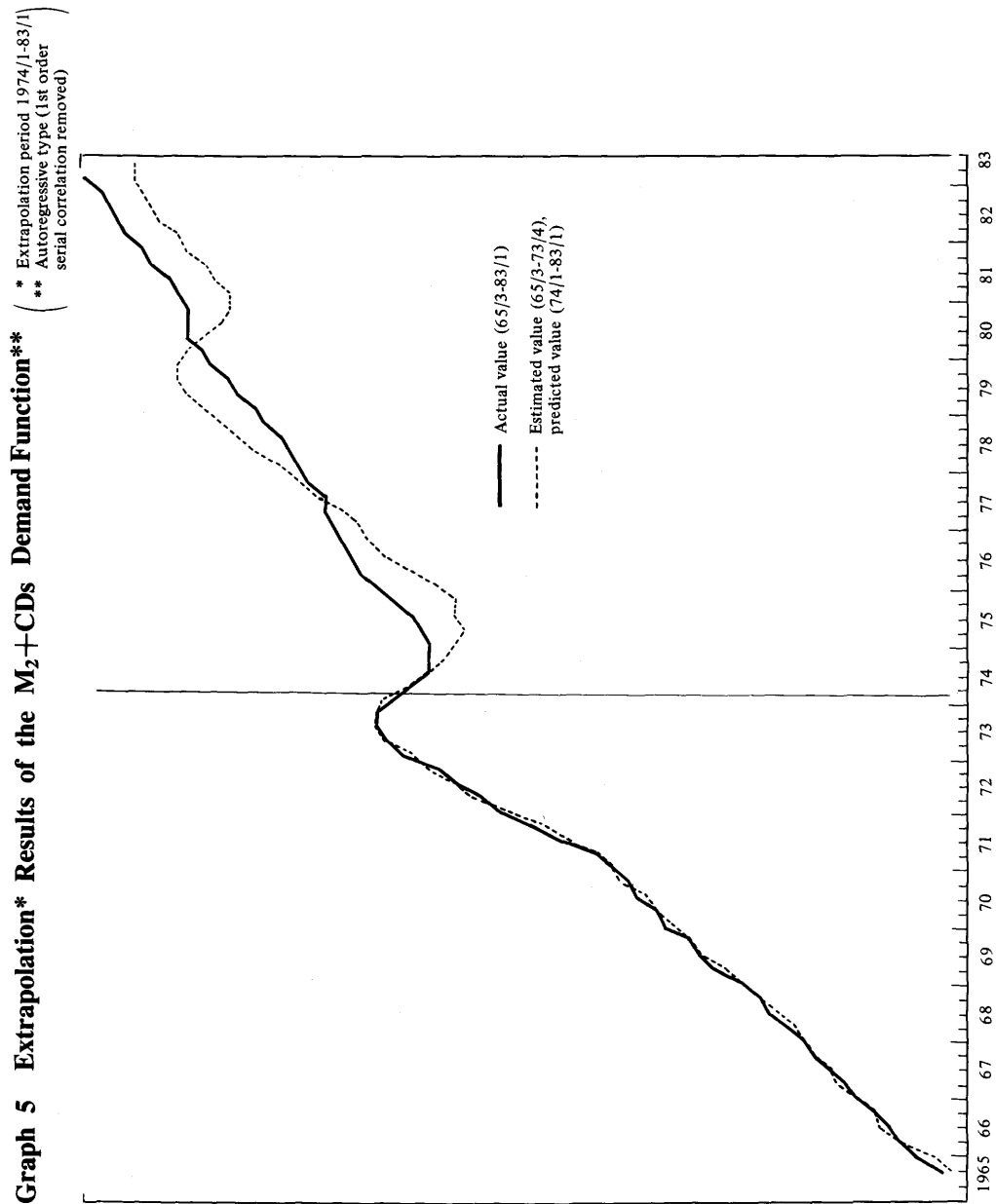
demand function for $M_2 + \text{CDs}$, the estimation in which serial correlation has been removed (D.W., the last row, Table 7, 1.95) is used for making comparisons between the pre-1973 and post-1974 periods, as serial correlation is evident in the first estimation using post-1974 data (1.18). While the income elasticity has not changed significantly (long-run elasticities 1.15 and 1.47), the interest rate elasticity has clearly declined (long-run elasticity -0.365 to -0.071) and its significance has also fallen (t-values 6.3 and 1.2). This is probably due to the fact that most of the interest rates on instruments included in $M_2 + \text{CDs}$ have come to be either more and more responsive to market interest rates or are revised more frequently so as to maintain a certain differential vis-à-vis market rates. The time deposit rate is not significant in either period, probably because of the presence of multi-collinearity.

As shown above, structural changes in the money-demand functions in Japan, in the form of declining income elasticity of M_1 (which leads to a "missing money" phenomenon) and declining responsiveness to interest rate changes in the demand for $M_2 + \text{CDs}$, are the result of financial innovation. This is confirmed by the evidence in Graphs 4 and 5. When the pre-1973 M_1 demand function is extrapolated through the period after 1974, the predicted values tend to be larger than the actual ones and a "missing money" phenomenon appears. On the other hand, when the pre-1973 demand function for $M_2 + \text{CDs}$ is extrapolated through the period after 1974, the predicted values tend to fluctuate around the actual values, suggesting that, although the income elasticity has remained unchanged, the interest elasticity has undergone a structural change.

Graph 4 Extrapolation* Results of the M_1 Demand Function**

* Extrapolation period 1974/1-83/1
 ** Autoregressive type (1st order
 serial correlation removed)





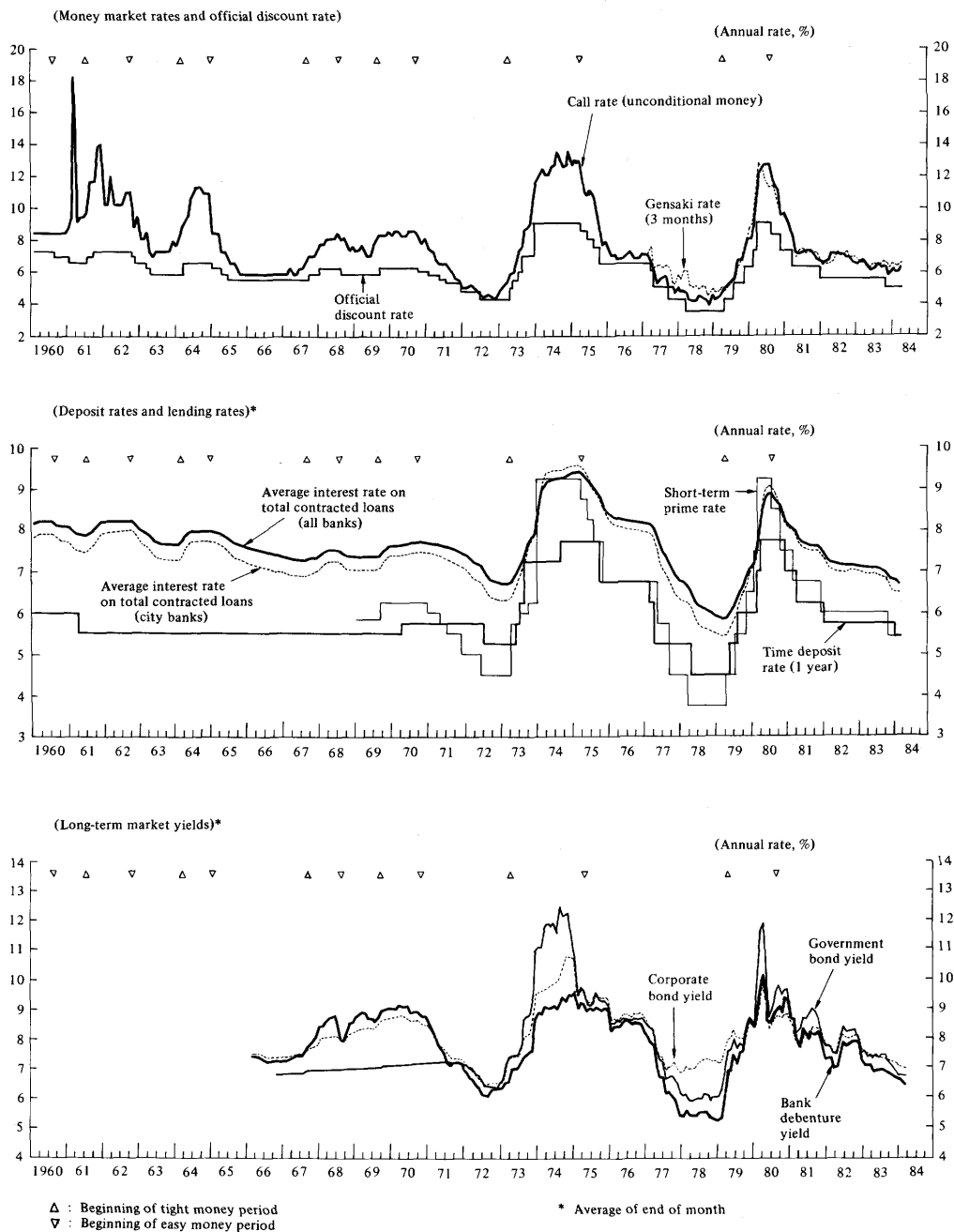
Finally, on the supply side, the interest rate in the interbank market is used as an operating variable by the Bank of Japan instead of base money or bank reserves. Hence changes in the money multiplier accompanying structural shifts in the money-demand function pose no particular problem for monetary control. (For details see sub-section below.)

2. Interest Rates

Developments in key interest rates over the last 24 years are shown on a monthly basis in Graph 6. Differences between the pre-1973 era of rapid economic growth and the period that followed are immediately obvious. The fluctuations in all interest rates, other than the call-money rate, were small before 1973, but they became larger thereafter.

There are three reasons why the amplitude of the fluctuations was small in the era of rapid economic growth. Firstly, it was part of government policy to stabilise interest rates at low levels, as can be seen from the fact that the official discount rate remained low and fluctuations in it were small. The aim was to keep the cost of finance for investment and exports low in order to promote high economic growth. As a result, regulated rates including interest rates on deposits were low and rigid. Secondly, the low inflation rate during the period can be cited as an element in the economic background that made a policy of keeping interest rates artificially low feasible. The average inflation rate between 1960 and 1972 was 5.7 per cent. in terms of the Consumer Price Index (CPI) and 1.1 per cent. in terms of the Wholesale Price Index (WPI). The difference between these two rates reflects sharp changes in relative prices accompanying rapid economic expansion. Thirdly, rigidity in interest rates was maintained by institutional factors that contributed to the segmentation of financial markets, such as the predominance of indirect financing and the constraints placed on international capital movements by foreign exchange controls. With indirect financing predominating, the interbank market was highly developed and the call-money rate fluctuated flexibly, while open money markets and the bond market remained underdeveloped and arbitrage between the call-money rate and interest rates in these open markets was far from perfect. Furthermore, reflecting this situation in the open market, the arbitrages between interest rates charged on loans by financial intermediaries and open-market interest rate were also weak. The interest rate on lending was rigid and credit was normally rationed. Foreign exchange controls tended to prevent international financial transactions from breaking down market segmentation and weakening traditional structures characterised by low and rigid interest rates and credit-rationing in the financial sector.

To explain why interest rate fluctuations have become larger in amplitude and why the average levels of interest rates have risen since 1973, it is appropriate to

Graph 6 Trends in Interest Rates

consider two periods separately. The first period runs from 1973 to 1978. During this period, as a result of an excessive supply of money and an excessively expansionary fiscal policy following the revaluation of the yen at the end of 1971, as well as of the first oil crisis, the rate of inflation was high. The inflation rate in terms of changes over twelve months reached 26.2 per cent. at its peak (October 1974) for the CPI and 33.8 per cent. (February 1974) for the WPI. In response to this, the official discount rate and other regulated rates were increased sharply, and accompanying this came high interest rates in the interbank market. Consequently, the previously relatively sticky interest rates in the open market and on bank lending also fluctuated over a wide range. It took quite a long time for the rate of inflation to slow down, and interest rates did not return to their former levels until 1976-77.

Fluctuations in interest rates since 1979 have largely been the result of circumstances quite different from those prevailing in the pre-1972 period. Firstly, the policy of keeping interest rates artificially low was abandoned, and in its place a policy of adjusting interest rates flexibly to levels consistent with appropriate monetary growth rates was adopted. This becomes evident when it is observed that, in the wake of the second oil crisis, the official discount rate, market interest rates and regulated rates including those on deposits were all raised promptly to levels comparable with their previous peaks and were then lowered quickly as inflation subsided (see Graph 6), despite the fact that peak inflation rates in this period, at 9.0 per cent. in terms of the CPI (September 1980) and 18.4 per cent. in terms of the WPI (May 1980), were relatively modest in comparison with those recorded in the previous inflation period. Secondly, changes in the financial system, such as the declining share of private indirect financing, the development of open markets, ongoing financial innovation and increasing integration of domestic and foreign financial markets, fostered competition within the financial system and diminished market segmentation. As a result, interest rates, especially long-term interest rates, became more flexible. (Changes in short-term interest rates, both before 1973 and after 1974, reflected changes in monetary policy, and the difference in the pattern of fluctuations between the two periods mainly reflected the differences in monetary management.) As can be seen in Graph 6, monthly data on yields in the secondary bond market have displayed minor but frequent changes, and, reflecting this, regulated rates such as rates on newly issued government bonds underwritten by syndicates, on money trust and on loan trusts have adjusted more frequently than before. Also, as described in Section III-2, the share of variable rate lending in total long-term lending has been increasing.

Yield curves for market interest rates were shown in Graph 2 in Section II. Empirical evidence suggests that the expectations theory of the term structure of interest rates is valid in the Japanese market.⁴ Consequently, continuous movements in long-term market interest rates can be explained by the following four factors,

bearing the expectations theory in mind. Firstly, when interest rates in the United States become volatile, so do short-term interest rate expectations in Japan. The reason is that when interest rates in the United States rise, the expectation that the Bank of Japan will not lower interest rates because it wishes to avoid a depreciation of the yen dominates the market, and as a result short-term interest rates are expected to rise. The reverse is true when interest rates in the United States decline. Secondly, in May 1982, when it became known that the Government's deficit in Japan was larger than had been expected, long-term interest rates rose steeply. This resulted from the fact that expected short-term interest rates rose as people came to expect crowding-out in the future. Thirdly, between April and October 1982, a rise in the interbank market rate resulted from the Bank of Japan's policy of preventing depreciation of the yen, and through arbitrage this induced the increase in interest rates in open markets such as the Gensaki and CD markets. Such an increase in the current short-term rates in turn affects the current long-term interest rates, albeit to a smaller extent. Fourthly, for a variety of reasons, exchange rates show volatile fluctuations. This results in large-scale inflows and outflows of capital which affect the demand for and supply of funds and induce frequent movements in interest rates.

3. The Transmission Mechanism

Before 1973, when indirect financing was predominant in the Japanese financial system, the effects of monetary policy were transmitted through the rationing of credit by the private financial intermediaries, especially banks, to the private non-financial sector. Since 1974 open markets have developed as a result of structural changes in the financial system, and flexible movements in the interest rates in these markets have added two channels of transmission of monetary policy.

In the pre-1973 period, when the interest rate in the interbank market rose substantially above the official discount rate in response to the use of policy instruments by the Bank of Japan, particularly the rationing of the central-bank credit granted through the discount window (see the call-money rate in Graph 4), banks and other private financial intermediaries held down their lending and subscriptions to corporate bonds on which the interest rates were rigid and sought to increase their loans or to decrease their borrowings in the interbank market. As a result, the availability of credit to the private non-financial sector was reduced and the spending of this sector was restrained. This process was supplemented by the Bank of Japan's window guidance on the growth of bank lending to the private non-financial sector, which had an effect of speeding up adjustment in the banks'

4. On the term structure of interest rates in Japan, see Kuroda & Okubo [10] [11] and Kuroda [12].

portfolios.⁵

However, since 1974, as open markets such as the Gensaki market and the secondary government bond market have developed, interest rates in these markets have begun to move flexibly, reflecting arbitrage linkages with the interbank market rate, which is directly affected by monetary policy. As a result, monetary restraint in 1979-80 pushed up the Gensaki rate to 12-13 per cent. This provided two new channels through which monetary policy works. The first one is financial disintermediation. As shown in Graph 2, Section II, the yield curves for market interest rates, as the expectations theory of the term structure of interest rates implies, have a negative slope during periods of monetary restraint. By contrast, the yield curves for regulated interest rates are always positively sloped, as has already been noted. Thus, as is clear from Graph 2, for assets with terms of less than five years the differentials between unregulated open market rates and regulated rates on assets provided by financial intermediaries increase markedly, so that funds flow out of private financial intermediaries into the open markets with the result that the loanable funds available to the private financial intermediaries are curtailed. The second mechanism is the direct effect on private spending of sharp interest rate increases in the open markets. As described in Section II, the accumulation of financial assets by the private non-financial sector has accelerated since 1974, and a large part of the increase has taken the form of investments in open-market instruments with unregulated interest rates (in the Gensaki market, the CD market, the primary market for medium-term government bonds, the secondary market for long-term government bonds, etc.). As a result, sharp increases in interest rates in these open markets have come to imply a higher opportunity cost of investment and consumption. During the second and third quarters of 1980, when monetary restraint entered its last phase, the demand for funds declined as the private sector responded to higher interest rates by cutting spending voluntarily, and some banks even had unused lending capacity under their window guidance credit ceilings. That is to say, a transmission mechanism based on the interest elasticity of spending has become more important than one based on credit-rationing, which had been the most important mechanism in the era of rapid economic growth.

As financial innovation and deregulation of interest rates advance, the traditional transmission mechanism and the two new transmission mechanisms will probably change in the following ways.⁶ Firstly, the traditional mechanism relies on

5. For a discussion of the instruments of monetary policy and the channels of transmission, see Suzuki [16], Parts II, III and IV.

6. For a detailed discussion of the relationships between financial innovation and the transmission mechanism, see Suzuki [17].

the rigidity of interest rates on lending and on newly issued bonds. If these rates become as flexible as those in open markets, as interest rate deregulation proceeds, then monetary policy will no longer be able to affect the attitude of private financial intermediaries towards lending and subscribing to newly issued bonds. As a result, this mechanism will probably vanish in the future.

Likewise, of the new transmission mechanisms, disintermediation depends on the rigidity of interest rates on placements with private financial intermediaries, such as deposits. If these rates come to be adjusted more frequently to reflect changes in market interest rates or are completely liberalised at some point in the future, this mechanism too will probably disappear.

Therefore, as financial innovation and deregulation of interest rates proceed, each stimulating the other, two of the three transmission mechanisms will vanish, and probably only the mechanism operating through the effect of interest rates on private spending will remain. However, this does not mean that the effectiveness of monetary policy will decline. The reason is that interest rates in the rapidly expanding open markets, including the newly born Treasury bill market, those on financial assets, especially deposits offered by private financial intermediaries, and those on credit will all become increasingly flexible, so that the cost of spending for economic units, whether they are net borrowers (paying interest) or net financial investors (incurring opportunity cost by forgoing interest received), will fluctuate more widely than before. In order to maintain the effectiveness of monetary policy, it is the intention of the Bank of Japan to promote the deregulation of interest rates. Of course, those who are pessimistic about the interest elasticity of spending will see some problems in this course. However, in Japan the effect of real interest rates in influencing real expenditure has been confirmed by various statistical tests. A recent study applies a multi-variate time series model and uses the method of relative power contribution to test the causality between real expenditure,⁷ the real interest rate, the nominal interest rate and money M_2 +CDs. The result shows that it is the real interest rate that has the largest effect on real expenditure, although real expenditure also has a small feedback effect on the real interest rate and causality does not run only in one direction. The effect of the money supply on real expenditure is small, while that of the nominal interest rate is negligible. The money supply has dominant effects on nominal variables such as nominal spending and prices but not on real variables.

Besides the above transmission mechanisms that act directly on the domestic economy, an indirect mechanism operating through the effect on spending of exchange rate movements induced by interest rate changes becomes effective as

7. On relative power contributions and for details of the empirical study, see Okubo [14].

domestic and international financial markets become more and more closely integrated. In these circumstances, a decline in the real interest rate brings about a depreciation of the yen beyond its purchasing power parity, that is, a depreciation of the real exchange rate (or what amounts to the same thing, a worsening of the terms of trade). This acts upon the domestic economy as a real shock which raises prices and lowers real income and thus contributes to stagflation. Therefore, so long as the increase in exports consequent upon the depreciation of the real exchange rate is not sufficient to offset losses in real income due to a real shock coming through the above transmission mechanism, then a lower interest rate has a net contractionary effect on the real economy. As this acts in the opposite direction to the direct effect of lower interest rates on domestic economic activity, the two effects tend to run counter to one another, and the net effect on economic activity is uncertain. The only certainty is that a lower interest rate brings about the undesirable effects of exchange rate depreciation and an increase in prices.

The current situation in Japan corresponds precisely to this model, since during periods when the yen is weak, voluntary restraint is necessary to prevent a sharp increase in exports which might provoke trade conflicts. This is a so-called internal-external dilemma case.

Finally, the increase in the interest elasticity of real expenditure as described above and the decrease in the interest elasticity of the money-demand function as described in sub-section 1 of this section will have the consequence of enhancing the importance of the crowding-out effects of an expansionary fiscal policy accompanied by large government deficits. Conversely, an attempt to cut the government deficit will become more effective in lowering interest rates and in promoting investment as well as in improving supply conditions in the economy in the long run. On the other hand its deflationary effect in the short run will also be small. Thus, reducing the government deficit is one of the most desirable policy options available, and this explains why it is considered a matter of the highest priority in Japan.

4. Problems of Monetary Control and Policy Options

Structural changes in the financial system and financial innovation have not so far caused any difficulty in identifying the appropriate supply of money. Firstly, as shown in sub-section 1 of this section, there is no particular problem associated with the definition of money. Secondly, as shown in the same sub-section, although the money-demand function has undergone structural shifts, these are not so large and abrupt as to make the identification of the appropriate quantity of money difficult. Of the monetary aggregates, the Bank of Japan pays most attention to $M_2 + CD$ s in view of its controllability and close causal relationships with the final goals of policy such as the price level. When an extrapolative test of the pre-1973 demand function

for M_2 +CDs is made for the period since the first quarter of 1974, the predicted values fluctuate around the actual values cyclically, as was seen in Graph 5, and there is no phenomenon of "missing money" as there is for M_1 . Therefore, in deciding the appropriate supply of M_2 +CDs all that needs to be taken into account is the fact that its interest elasticity has declined, and the new money-demand function for the period since the first quarter of 1974 that includes the new interest elasticity (Table 7) can serve as a good guide.

As regards the controllability of M_2 +CDs, interest rates in the interbank market, instead of monetary aggregates such as base money or reserve indicators, are used as the operating variable in Japan, as pointed out in sub-section 1 of this section. Fluctuations in interbank interest rates have an effect on the final policy targets, such as the price level, through the three transmission mechanisms discussed in sub-section 3 of this section. Among them, the traditional channel that existed before 1973 and the channel which operates through disintermediation affect M_2 +CDs first and the policy targets later, while the channel that relies on interest elasticity affects M_2 +CDs and nominal expenditure at the same time. When the liberalisation of interest rates and the process of financial innovation are completed in the remote future, the first two transmission mechanisms will vanish, and changes in M_2 +CDs will probably no longer lead to changes in the policy objectives. There is, however, a contrary view that the lead of changes in the money supply will not disappear because of the existence of a buffer stock (unintended inventory fluctuations) that reflects disequilibrium between the demand for and supply of money.⁸ At any rate, nothing can be said with certainty concerning the future. However, when the discussion is restricted to the present situation in Japan, there is statistical evidence that M_2 +CDs is strongly affected by changes in the interbank rate, as causality tests using the relative power contribution method for the sample period since the first quarter of 1974 reveal.⁹ Hence, for some time to come, there appear to be no grounds for anxiety about the controllability of M_2 +CDs.

As regards the causal links between M_2 +CDs and final policy objectives, evidence based on statistical methods such as the Sims' test, the relative power contribution test, the estimation of total nominal expenditure functions and multi-variate time series models all confirm that causality runs from M_2 +CDs to prices and total nominal expenditure.¹⁰ Furthermore, in the sense that feedback from prices and real GNP is small, M_2 +CDs can be considered to have a higher degree of

8. See Judd & Scadding [9].

9. See Okubo [14].

10. See Kuroda, Namba & Oritani [13], Oritani [15] and Okubo [14].

exogeneity than the nominal interest rate and the real interest rate and is therefore the most appropriate indicator to use as an intermediate target.¹¹

Judging by the degree of difficulty faced in identifying the appropriate supply of money as well as by considerations of controllability and causality, no need to change the policy followed since the late 1970s of emphasising $M_2 + \text{CDs}$ as the main intermediate target is felt. However, this does not mean that the Bank of Japan does not take other intermediate financial variables such as bank credit, interest rates and the exchange rate into account. It takes a multi-faceted attitude towards policy implementation, paying close attention to various intermediate financial variables in addition to the money stock, as well as to developments in the final objectives of policy such as the price level and total nominal expenditure. This is necessary because many factors including unpredictable expectations influence the transmission process so that the quantitative relationship between $M_2 + \text{CDs}$ and final goals such as prices undergoes fluctuations, although it is generally closer than the relationship between other intermediate variables and the price level.

In addition, the Bank of Japan has no intention of attempting to control short-term movements in $M_2 + \text{CDs}$. As the effect of changes in $M_2 + \text{CDs}$ on total nominal expenditure and prices extends over a span of two years, it is sufficient, in order to stabilise current total nominal expenditure and prices, to stabilise the weighted average of the rate of increase in $M_2 + \text{CDs}$ over the previous two years. An attempt to stabilise short-run monetary growth rates would not only be meaningless but also damaging in the sense that it might give rise to fluctuations in interest rates and the exchange rate which would increase uncertainty among economic agents.

5. Broader Issues: Financial Stability and Regulation

As already described in Sections III-2 and IV-2, in the domestic financial system in Japan there is no problem of bank management having to cope with large and unpredictable fluctuations in interest rates, or of the stability of the whole financial system being endangered. Owing to a slowdown in inflation and a relatively good macroeconomic performance, together with the effect of some remaining regulations, domestic interest rates in Japan do not fluctuate as violently as those in the Euro-dollar or US domestic markets.

From the point of view of the stability of the domestic financial system, a problem that may arise in the future is that, with the deregulation of interest rates and financial innovation continuing and interacting, certain financial institutions whose business is based on regulated interest rates will face severe interest rate competition and a contraction of profit margins will bring them into difficulties. This

11. See Okubo [14].

is the main concern of a large number of medium and small-scale deposit institutions such as mutual loan and savings banks (the 69 "Sogo" banks), credit associations (the 456 "Shinkin" banks) and credit co-operatives (the 468 "Shinso" co-operatives). Once every two or three years the Bank of Japan inspects financial institutions in order to check on the soundness and stability of their business and pays attention to making sure that difficulties experienced by one bank do not cause instability in the whole system. At the same time, deregulation is, as far as possible, carried out at a moderate progressive pace so as to make sure that the management have enough time to adapt themselves to it.

Another problem relating to the stability of the financial system as a whole is that of system risk accompanying advances in electronic technology. From now on, with most interbank transactions being carried out by electronic fund transfer (EFT) and the resulting broadening and quickening of settlement procedures, system risk of accident or crime associated with the misuse of computer systems will be on the increase. Should accidents or malpractice occur, the damaging effect on the viability of the financial system could be serious. In order to prevent this, the security system in the payments network is of primary importance, and the Bank of Japan is also looking into this. But, at the same time, the adequacy of the security measures in each of the financial institutions which are members of the payments network is also very important. Inspection of financial institutions by the Bank of Japan should include checks on these matters in the future.

Secondly, whether for ensuring the effectiveness of monetary policy or the stability of the financial system, the question of imposing reserve requirements on all the fund-raising instruments in the financial system or applying appropriate ratios to the assets of the banking system is also raising a number of problems. If a uniform regulation is applied, then new devices to evade it may be created. In this way, the efficiency and equity in the financial system may be impaired. The risky period for the stability of the financial system or the effectiveness of monetary policy is the transition phase when deregulation is under way. During this period, on the one hand, regulations still exist on a broad basis, and on the other, the degree of freedom in operating new devices to circumvent regulations is increasing, and it becomes difficult for the policy authorities to predict what will occur next. But in time deregulation will have reached the optimum level in present circumstances, and if this is to become the new framework, some kind of stability in the financial system will probably be restored.

It is not possible to predict the future with certainty. What can be said is that those regulations which have become out of date as economic conditions changed, and which are obstructing the efficiency and equity of the system, should be abolished. There is no alternative to searching for a new framework for the financial system and the remaining regulations compatible with changing economic conditions

in the gradual process of deregulation, while paying attention to changes in the efficiency and equity of the system.

V. Cross-Country Observation

1. Toward a General Theory

Generally speaking, at any time and in any country, financial innovation arises as a device on the part of the private financial sector to solve or to circumvent conflicts between the newly developing economic conditions and the old statutory financial framework and regulations which played an important rôle in the past but have become obsolete. And financial innovation is further promoted when the financial authorities recognise the obsolescence of the existing statutory framework and regulations and relax them.

The common background against which financial innovation has been proceeding, more or less, in every industrialised country since the 1970s is that they have the common economic conditions which have emerged simultaneously during the past decade, and that the old financial framework more or less failed to cope with these newly developing conditions.

And also, the reason why the speed and spread of financial innovation and their impact upon money velocity and monetary targeting are different from country to country is that the extents of the newly developing economic conditions and the types of old statutory framework and regulations are different in each country, so that the seriousness of conflicts between them are also different from country to country.

Now, let us point out what are the newly developing economic conditions of the past decade, and what are the old statutory framework and regulations which played an important rôle in the past, but cannot cope with the newly developing conditions today.

The newly developing conditions are mainly the following four: first, the high and volatile interest rates due to the worldwide inflation since the first oil crisis in 1973; second, the application to financial transactions of technological progress in computer and telecommunications; third, more active international shifts of funds among industrialised countries since the global floating of exchange rates in 1973; and finally, the increase in public-sector deficits resulting in a large-scale issue of government bonds which has stimulated developments of open markets in the financial system.

In contrast to these four newly emerging economic conditions, there were some financial regulations or statutory framework which were not able to cope with them: first of all, regulations of interest rates on financial instruments provided by financial

intermediaries; second, the strict statutory distinction between banking and securities business, or the existence of the private cartel which has compartmentalised financial business; third, high reserve requirements with no or low interest rates on a certain range of financial institutions' liabilities; and fourth, exchange control and other regulations which have separated international and domestic financial markets.

It may not be necessary to elaborate on the conflicts that occurred during the past decade between these four newly developing conditions and the four old financial framework or regulations, and the resultant financial innovation. To make sure, however, let us present only a few examples. Conflicts between high and volatile interest rates, and interest rate regulations and reserve requirements have been the background for a lot of innovative financial instruments with market-oriented interest rates. With technological progress in computers and telecommunications, in order to circumvent the strict distinction between banking and securities business, many kinds of cash management services and retail banking services have been developing. To solve the conflicts between the active movements of international funds and the statutory segmentation of international and domestic financial markets, Euro-markets and off-shore markets have played an important rôle.

2. Grouping of Countries

With this approach in mind, let us classify the industrialised countries into three groups with respect to financial innovation, stability of money velocity, and their implications for monetary targeting. Of course, there exist to some extent differences among the countries within the same group.¹²

Group I consists of the United States, Canada, and the United Kingdom. These three countries have had all of the newly developing conditions during the past decade, and at the same time, have had, or used to have most of the four statutory financial frameworks or regulations. For instance, in the case of the United States, they have had high and volatile inflation rates, rapid technological progress with computers and telecommunications being applied to financial transactions, big public-sector deficits providing a lot of government securities for the financial system, and active inflows and outflows of international funds. On the other hand,

12. For instance, although Canada has never had interest rate regulations, she is included in Group I, being quite similar to the United States and the United Kingdom as regards other regulations, economic conditions, and the resultant changes in the velocity of money. Japan is the only country in Group III which has a low rate of inflation. However, she shares the same background with other countries in Group III so far as the statutory financial framework and its relation to financial innovations are concerned. Making more groups would not necessarily improve the results of a cross-country analysis, and it often makes them more ambiguous.

they had Regulation Q (now abolished), the Glass-Steagall Act separating banking and securities business, high reserve requirements with no interest rate, and so forth.

Because of having all of the newly developing conditions and almost all of the old statutory frameworks, conflicts between them are so serious in these three countries that financial innovation to circumvent the obsolete regulations has been proceeding rapidly, followed by abrupt deregulation resulting in the further, uncontrollable promotion of financial innovation. In such circumstances, it is quite natural that sudden changes in the moneyness of traditionally defined monetary aggregates together with shifts in the money-demand function and velocity have occurred in an unprecedented manner so that central banks missed how much the optimal quantity of money was. The Federal Reserve System de-emphasized M_1 , Bank of Canada abandoned monetary targeting, and Bank of England is looking for aggregates other than sterling M_3 , such as M_0 , but so far without success.

However, we should not regard the experience of these three countries as a general trend. There are many other countries in the world which have different experiences.

At the other extreme is *Group II*, which consists of West Germany, Switzerland, the Netherlands, and Austria. In these countries, interest rates on deposits were deregulated in the second half of the 1960s. They have also the universal banking system whereby banks are allowed to operate in the securities business as well. In this sense, they have not had two of the four regulations which have caused financial innovation in the countries of Group I.

In addition, on the side of the newly developing conditions, their interest rates have not been so high and volatile as in the Group I countries because their inflation rates have been lower and more stable. Furthermore, their technological progress in computers and telecommunications and its application to financial transactions is not as advanced as in Group I. Therefore, they have only two of the four newly developing conditions which the countries of Group I have.

Consequently, conflicts between the newly developing economic conditions and the old statutory financial framework are not serious at all, so that financial innovations in the Group II countries have been quite limited, the money-demand function and velocity are stable, and the central banks of these four have experienced no difficulty with monetary targeting so far.

In the middle, between Group I and Group II, there is *Group III*. Those which belong to this group are Japan, France, Italy, Belgium, and Sweden. The common background of these countries is that the large-scale issue of government bonds caused by an increase in public-sector deficits has resulted in the development of the open markets where interest rates are determined through free competition. Since market-determined interest rates are higher than regulated interest rates on instruments of financial intermediaries, financial innovation started in these

countries to take advantage of these interest rate differentials, and the money-demand function as well as the velocity of narrowly defined monetary aggregates have also been shifting.

However, the central banks of these countries do not suffer much from these developments in the financial system in implementing their monetary policy for various reasons.

In the case of Belgium, their intermediate target is not a monetary aggregate, but the exchange rate, especially vis-à-vis the Deutsche Mark. In the case of France, Italy and Sweden, they pay much more attention to domestic credit expansion rather than monetary growth.

3. What Does the Japanese Experience Suggest?

The case of Japan is a bit more complicated. She shares a lot of common statutory framework and economic conditions with the United States. For instance, Japan has regulations on interest rates like Regulation Q, a strict statutory distinction between banking business and securities business, and rapid progress in micro-electronics and telecommunication, which are quickly applied to financial business.

However, the pace of financial innovation in Japan has not been as fast as in the United States. This is because deregulation has progressed only gradually. Gradualism in deregulation is made possible against the economic background of stable prices. As prices and other macroeconomic performance have been stable since 1977, volatile fluctuations in interest rates have been rare and there is no urgent need to carry out deregulation hastily.

Even in Japan, however, a result of the Chow test in Table 8 tells us that the money-demand functions of M_1 and $M_2 + \text{CDs}$ structurally shifted between the period before 1973 and after 1974, as financial innovation has advanced since around 1974. In the Japanese case, as interest rates on transactions accounts are not deregulated yet and those on investment accounts have become more and more market-oriented, the income elasticity in demand for M_1 and the interest rate elasticity in demand for $M_2 + \text{CDs}$ have declined significantly. As a result, the declining trend in the velocity of M_1 kinked around 1974, and it has shown a rising trend since then. As for the declining trend in the velocity of $M_2 + \text{CDs}$, it did not change, but when we calculate Divisia $M_2 + \text{CDs}$, the declining trend in its velocity also kinked around 1974, and it has remained rather stable since then.

In the case of Japan, however, structural shifts in demand for M_1 and $M_2 + \text{CDs}$ are not so abrupt as to obscure the optimum quantity of money and neither do they threaten controllability of the annual monetary growth. This is because it took ten years for structural shifts to occur. The causality between money and prices has continued to be observed during that period judging from the result of relative power

contribution test, though quantitative relationships are changing gradually.¹³

There are unresolved issues concerning the effectiveness of monetary policy, the appropriateness of the money stock as an intermediate target and the stability of the financial system in a world in which the process of financial innovation is completed. What is certain, however, is that the more stable prices and other macroeconomic performances are, the more effective monetary policy will be, the more easily can the appropriate supply of money be identified, and the more stable the financial system will be. There is no evidence from the experience of Japan so far that financial innovation has destabilised the economy. Therefore, when evaluating the effects of financial innovation on monetary policy and the financial system, it is important to determine whether they are the result of financial innovation itself or rather are the consequence of increasing instability in the economy. Disruptive effects of the latter should not be attributed to financial innovation.

13. See Okubo, T. [14].

REFERENCES

- [1] Akhtar, M.A., "Financial Innovation and Monetary Policy: A Framework for Analysis", BIS, *Financial Innovation and Monetary Policy*, Basle, March 1984.
- [2] Barnett, W.A., "Economic Monetary Aggregates", *Journal of Economics*, 14, 1980.
- [3] ———, "The Optimal Level of Monetary Aggregation", *Journal of Money, Credit and Banking*, February 1983.
- [4] Barnett, W.A. and Spindt, P.A., "Divisia Monetary Aggregates: Compilation, Data and Historical Behavior", Federal Reserve Board, Washington, D.C., *Staff Studies* No. 116, May 1982.
- [5] Cockerline, J.P. and Murray, J.D., "A Comparison of Alternative Methods of Monetary Aggregation: Some Preliminary Evidence", Bank of Canada, *Technical Report* 28, November 1981.
- [6] Goldfeld, S.M., "The Case of the Missing Money", *Brookings Papers on Economic Activity* No. 3, 1976.
- [7] Hamada, K. and Hayashi, F., "Monetary Policy in the Postwar Japan", Bank of Japan, *1st International Conference Papers* (mimeo.), 1983.
- [8] Heller, H.R. and Khan, M.S., "The Demand for Money and the Term Structure of Interest Rates", *Journal of Political Economy*, February 1979.
- [9] Judd, J.P. and Scadding, J.L., "Liability Management, Bank Loans and Deposit 'Market' Disequilibrium", Federal Reserve Bank of San Francisco, *Economic Review*, Summer 1981.
- [10] Kuroda, A. and Okubo, T., "On the Determination of Yields in Japanese Secondary Bond Market: An Expectations Theory Approach", Bank of Japan, *Discussion Paper Series* No. 7, August 1981.
- [11] ———, "An Empirical Investigation of the Term Structure of Japanese Government Bond Yields: An Analysis Using a Bivariate Time Series Model", Bank of Japan, *Discussion Paper Series* No. 11, January 1982.
- [12] Kuroda, A., "Expected Inflation Rates and the Term Structure of Interest Rates: A Theoretical Model and Empirical Analysis Using Yields on Japanese Government Bonds in the Secondary Market", Bank of Japan, *Monetary and Economic Studies* Vol. 1, No. 1, June 1983.
- [13] Kuroda, I., Namba, S. and Oritani, Y., "Money, Income, and Government Expenditure: A Test of Monetarist Hypotheses on the Japanese Economy", Bank of Japan, *Discussion Paper Series* No. 1, April 1980.
- [14] Okubo, T., "Money, Interest, Income and Prices", Bank of Japan, *Monetary and Economic Studies* Vol. 1, No. 2, October 1983.

- [15] Oritani, Y., "The Negative Effects of Inflation on the Economic Growth in Japan: An Evidence from Conditional Forecasts by a Multi-variate Time Series Model", Bank of Japan, *Discussion Paper Series* No. 5, April 1981.
- [16] Suzuki, Y., *Money and Banking in Contemporary Japan*, Yale University Press, 1980.
- [17] ———, "Interest Rate Decontrol, Financial Innovation, and the Effectiveness of Monetary Policy", Bank of Japan, *Monetary and Economic Studies* Vol. 1, No. 1, June 1983.
- [18] ———, "Changes in Financial Asset Selection and the Development of Financial Markets in Japan", Bank of Japan, *Monetary and Economic Studies* Vol. 1, No. 2, October 1983.