Interest Rate Decontrol, Financial Innovation, and the Effectiveness of Monetary Policy

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This article examines, with reference to Japanese experience, the relationships of three factors, interest rate determination (market rates or controlled rates), the financial structure, and the channels of transmission of monetary policy. It also considers the problems of interest rate decontrol, what form future financial innovations will take, and the effectiveness of monetary policy within this framework.

I. Financial Structure and Transmission Channels of Policy Effects

A. Types of Financial Assets

To discuss interest rate decontrol, financial innovation, and monetary policy, we must first examine what assets interpose themselves in the transmission channels of monetary policy and how interest rate decontrol and financial innovations will change these assets. Table I shows a classification of six types of assets, labeled (A) to (F). (A class of assets is hereafter always enclosed in parentheses, as distinguished from a specific asset which might be denoted by the same letter. For example, "(B)" is an asset of type (B) while "B" may denote bonds.) The

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Table I. Types of Financial Assets

Function	Transactions			Investment		
Predictability	Safe			Risky		
Interest Rate Mechanism	Controlled Rate			Free Rate		
Mode of Issue	Indirect Securities				Primary Securities	
Mode of Transactions	Market	Bilateral		Market	Bilateral	Market
Type	(A) Currency, High Powered Money (Base Money)	(B) Deposit Money (Demand Deposits)	(C) Quasi Money (Time & Postal Deposits, Loan Trusts)	(D) CDs, Financial Debentures, Bills sold by banks	(E) Loans, Borrowings	(F) Public Bonds, Corporate Debentures, Equities, Commercial Papers, BAs, TBs

Note: This classification is highly generalized to overcome various problems. That is, many problems remain at the more detailed level. For example, securities that are safe when held to maturity are of uncertain return if sold beforehand, and therefore are included in risky assets. Moreover, CDs can be regarded as a type of quasi-money, but they too have uncertain return if sold before maturity, and hence are risky. On the other hand, since bankruptcy of financial institutions is not impossible, deposits too have an element of risk. Also, since markets are not differentiated by maturity of instrument traded, this element is not included in the classification. A strict classification considering all such distinctions would increase the number of types of financial assets, but would not clarify the relationships between financial innovation and effectiveness of monetary policy. Hence, we limit the classification to six types.

classification is by function (transactions account assets or investment account assets), predictability of return (safe assets versus risky assets), interest determination mechanism (controlled rate or market rate), mode of issue (indirect securities or direct securities), and mode of transaction (market or bilateral). We will describe each of these in some detail before proceeding.

In any financial system, the existing assets may be classified by function, that

is the motivation for their being held by people. The two major types of assets here are transactions account assets and investment account assets.

The most important function of transactions accounts is as means of settlement (means of payment, or means of exchange) for transactions. In contrast, the most important role of investment accounts is as store of value. Hence, transactions accounts have higher liquidity than investment accounts, but the profitability of investment accounts is higher than that of transactions accounts.

In a world of nominal values (or a world of fixed prices), transactions account assets have low profitability, but the variance of its expected return is zero; in this sense they are safe assets. And because they are safe, transactions account assets simultaneously serve as units of account. In contrast, investment account assets have high returns, but their variance of expected return is positive, and in this sense they are risky. These attributes fulfill the differences of motivation which people have for holding assets.

This discussion will proceed with a single distinction about holding motivation for assets. Assets are held either for transactions motives or for investment motives.[1] Choice of assets based on transactions motives of Baumol-Tobin[2] are usually thought to take place between a safe transactions asset and a safe investment asset. It is not impossible to conceive of a risky investment account asset held for transactions purposes, but considering the usually high transactions costs of risky assets (e.g. the fees and trouble of securities transactions), such assets would not be in general use.

On the other hand, choice among assets held for investment purposes is made between safe assets and risky assets; but among safe assets, safe investment assets with high returns dominate safe transactions assets with low returns, so safe transactions assets will not be used for investment motives. The choice of investment assets will be between safe investment assets and risky ones.

Indeed in a financial system where safe investment assets do not exist (e.g. in the world of a "direct finance system" discussed below), the choice between

1. As is well known, Keynes distinguished three motives for holding money, the transactions motive, the precautionary motive, and the speculative motive. There would be some ambiguity in making precautionary motive separate and limiting ourselves to transactions and speculative motives when there is certainty about the time of expenditure or investment. Hence, we include the case of uncertain time of transaction and investment here, and distinguish two motives for money holding, one being the transactions motive, and the other not the speculative but rather the more general "investment" motive. On the ambiguity of the precautionary motive, see Tachi and Hamada [13], page 77.

2. For explanation of the transactions motive of the Baumol-Tobin type, in which transactions demand for money is a function of the interest rate, see Baumol [1] and Tobin [16].

assets held for transactions motives and those held for investment motives is made between safe transactions assets and risky investment ones.

In traditional financial systems before recent financial innovation, the interest rates on safe assets were fixed at controlled levels. But the interest rates (rates of return) on risky assets fluctuated freely in the market according to demand and supply conditions.

Let us continue our classification of assets by looking at the modes of issue of assets within the financial system. Following the tradition of financial theory of Gurley and Shaw [2] we call the financial assets supplied as liabilities of investment-surplus (funds-deficit) sectors "primary securities", and those supplied as the liabilities of financial intermediaries "indirect securities".

Safe transactions account assets and safe investment account assets are necessarily indirect securities. Hence the issuers of indirect *transactions* account securities are "monetary financial intermediaries" (i.e. banks), and those which issue indirect *investment* account securities are "non-monetary" or "non-bank" financial intermediaries. This class would include Trust Banks, trust departments of securities firms, thrift institutions, and insurance companies.

In contrast, risky investment account assets would include the indirect securities issued by financial intermediaries (e.g. financial debentures) and the primary securities issued by investment-surplus agents.

Finally, let us consider the mode of transactions. We call assets that are generated from bilateral loan agreements and that are not re-sellable "bilateral assets", and assets that are freely re-sellable (i.e. negotiable) "market assets". Among indirect transactions assets, currency is a market asset, and deposits are a bilateral asset. Among safe, indirect investment assets, time deposits, savings accounts, loan trust accounts (Japanese trust bank account with loan privilege), and other forms of quasi-money are bilateral assets. On the other hand, risky, indirect investment assets such as CDs, financial debentures, and bills sold by banks are market assets. Risky, primary, investment account assets include bilateral assets such as loans, and market assets such as public bonds, corporate bonds, equities, commercial papers, bankers acceptances, and treasury bills.

We have given a detailed classification of assets according to five characteristics, the results of which are given in Table I. The result is six types of assets, (A) through (F). In what follows, we examine the relationships among the channels of transmission of policy effects and the financial system, and finally consider the meaning and effects of financial innovation.

Table II. Flow of Funds Table (Stocks) for the Direct Finance Model

		Central Bank	Corporations	Households	Total
(A)	Currency	-M		M_h	0
(F)	Bonds	B	$-B_c$	B_h	0
Real Assets			PK_c		PK_c
Total		0	0	$NW = M_h + B_h$	$PK_c = NW$

Note: Minus sign denotes liability.
Notation: M: Currency B : Bonds (nominal) K: Real assets (real)
P : Price level NW: Net worth = total savings (nominal)

B. The World of Direct Finance: – The IS-LM Model –

First let us consider a world with only direct finance. In any financial system, a transactions asset (i.e. currency) is necessary, and such an asset can be issued only as the indirect liability of banks. Hence, let us bring the bare minimum of necessary indirect assets into the model, with a "central bank" which issues "currency". No other indirect asset exists. Thus, no private financial intermediaries exist, and so the indirect securities and bilateral assets they would issue also do not exist. All that exist are firms (investment-surplus agents) that issue "primary securities" and "households" (savings-surplus agents) that buy these primary securities directly. Currency is supplied by primary securities purchase operations of the central bank. Table II shows the flow of funds table (listed in stock data) of this world.

According to the classification of Table I, the two types of assets on the stage here are of type (A), a marketable, indirect, controlled rate (at zero), safe, transactions account asset, and type (F), a marketable, primary, free rate, risky, investment account asset. The crucial points about this world of "direct finance" are that both assets are marketable and that no bilateral assets exist. Moreover, except for marketability, these two assets differ in all their attributes. That is, because of the existence of the contrast that transactions assets are safe and investment assets are risky, all of people's asset holding motives may be fulfilled. And because of the existence of one controlled interest rate, the general equilibrium system may be

solved, and the free interest rate is uniquely determined (more on this below).

The model now has three assets, currency, M, securities, B, and real assets, K. The price level[3], P (the price of real assets, equivalent to the price of commodities), is given. The rate of interest on currency is set at zero, and is a type of controlled rate. Thus, endogenous variables are the free rate of interest on securities, r, and the level of real income, y. In a general equilibrium framework with three assets in demand/supply equilibrium, one equation is not independent due to Walras's Law; we drop the equilibrium equation for the securities market, and so the following two equations give full equilibrium.

$$\frac{\overline{M}}{P} = L(r, y) \quad : \text{currency market equilibrium} \tag{1}$$

$$I(r, y) + \overline{K}_{-1} = S(r, y) + \frac{\overline{W}_{-1}}{P} \quad : \text{real asset market equilibrium} \tag{2}$$

where I is investment, S savings, $\overline{K}_{-1}$ the existing stock of real assets, and $\overline{W}_{-1}$ is accumulated savings (net worth).

With the above definitions, we can say $P\overline{K}_{-1} = \overline{W}_{-1}$[4], so that equation (2) becomes

$$I(r, y) = S(r, y) \quad : \text{goods market equilibrium.} \tag{2}'$$

Equations (1) and (2)′ are nothing but Keynes's IS-LM model.

3. In this model real assets are nothing but the stock of real goods, so the two are identical commodities. Hence the price level is the same for both. In the general equilibrium asset selection model of Tobin [15], "real assets" are called "real capital", and the variable q, which is the relative price ratio of the price of existing capital (equity) and newly produced capital, determines the level of investment. But this construction describes the Anglo-American system in which the price of equity correctly reflects the value of assets, with takeover bids and sales of firms, and with capital increases the chief means of raising funds. This is unrealistic for Japan.
   In Japan investment is funded through bank loans, bond issue, and own-capital (mostly in the forms of open market assets), and so it is sufficient to think of the choice being between real assets and financial ones. It is not necessary to go to the trouble of introducing the somewhat ambiguous concept of a real capital and its price in addition to goods in general. I cannot agree with Tachi that "it is unrealistic not to distinguish the price of goods from the price of existing capital". The "price of existing capital", that is equity, does not move in a meaningful way so far as the Japanese investment decision mechanism is concerned. Indeed, the crucial factor is precisely the relationship of the rise in the price of existing assets, in this case goods, and the interest rate. For estimates of q for Japan, and for its poor relationship to corporate investment, see Nihon Shōken Keizai Kenkyū Sho [7].

4. When the price level, P, moves, the value of existing goods, $P\overline{K}_{-1}$, changes. If we say that the capital gains and losses thereby generated also change the value of existing net worth $\overline{W}_{-1}$, then the relationship $P\overline{K}_{-1} = \overline{W}_{-1}$ will hold continuously.

The transmissions channels for monetary policy in this world of direct finance are as follows. Let us consider a monetary tightening. The central bank sells securities, and absorbs currency. As a result the price of securities falls, i.e. the rate of return rises. Seeing this, investors reduce their investments, and savers increase their savings (i.e. reduce consumption). Expenditure is reduced from both the investment and consumption sides, and so real income falls. The adjustment is just about completed when the reduction in currency demand accompanying the fall in real income has just balanced with the reduction in supply. A monetary expansion reverses the process, starting with a securities purchase.

Let us note the following fact before proceeding. The reason this model could be solved is that, among the financial assets, there was one asset, currency, with interest rate fixed at zero. Even in an enlarged model with more types of assets, unless one asset has a controlled interest rate at a fixed level, the model will be unsolvable. In this sense, we get the seeming paradox that the effectiveness of monetary policy through the fluctuation of interest rates is underpinned by the existence of one controlled interest rate (in this case that of currency, controlled at zero). If all assets had free interest rates, the level of interest rates could not be determined endogenously in the model, and hence we could not determine the effects of monetary policy through interest rate fluctuations. This will be important point when we consider the effects of financial innovation upon policy effectiveness.

C. The World of Indirect Finance: – High Economic Growth Period Japan –

To clarify just what the problem is, let us consider a world of indirect finance, one exactly opposite to that given above.

The High Economic Growth Financial System

Both Rōyama [9] and Suzuki [11][5] have pointed out that the direct finance world of the IS-LM model is inappropriate for analysis of Japan's high economic growth period.

In the high growth period, particularly before the start of long term government bond issue in 1966, open markets[6] for both long and short term assets were

5. See Rōyama [9] pages 2-6 and Suzuki [11] pages 75-82.

6. An open market has the following characteristics: (i) agents other than financial intermediaries may participate; (ii) the general public may trade in the market through brokers. Hence, the interbank market, in which only financial institutions participate, and the

severely underdeveloped. The only market that private agents other than financial intermediaries could participate in was the equity market. And even after 1966, since the subscribers yield to bond buyers was held at a disequilibrium rate below market through the artificial low interest rate policy, and since the quantity of long term government bonds circulating in the market was small, neither long nor short term securities markets could develop.[7] The rapid growth of the long and short term open markets came as a result of the repurchase (*gensaki*) and secondary government bond markets during the period of excess liquidity of 1971-73, and was furthered by the post-1974 large-scale issues of government bonds due to lower growth and the reduction in overborrowing[8] by the corporate sector and consequent increase in that sector's liquidity.

Hence, in building a theoretical model to discuss monetary policy effects in the high growth era, we abstract from direct financial paths of open markets; the appropriate financial system is one simplified to include only indirect finance. In terms of the classification of assets in Table I, (F)-type primary, risky, market, free rate, investment assets do not exist. We must construct a model in which these attributes (riskiness, marketability, free rate determination, and investment-orientation) are included in indirect securities.

A Model with only Indirect Finance

This author presented such a model in 1966 (see Suzuki [10]).[9] Table III gives the flow of funds table for the model, again interpreted as stocks.

In contrast to the model presented above in Table II, this model introduces banks (separated into city banks and local banks, linked by an interbank market) as economic agents, thus adding issuers of indirect securities. Among the assets of type (A) and type (F) available previously, only those of type (A) remain. But the attributes of (F)-type assets such as marketability, primariness, free rates, risk, and investment-orientation are inherited by assets of types (B), (C), (D), and (E),

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bilateral transactions in loans and deposits by intermediaries and their customers are not open markets. The archetypal short term open markets are those in short term government securities, CDs, and commercial papers, while the long term open market is that in government bonds. In Japan, the short term money market was spontaneously generated with the development of the repurchase (*gensaki*) market in the mid-1960's.

7. For a description of the underdeveloped state of open markets until the mid-1960's and the reasons for this, see Suzuki [11] and the latest work by Teranishi [14].

8. "Overborrowing" is one of features of the Japanese financial system during the period of high economic growth. See Suzuki [11].

9. See Suzuki [10], 1966. The model in Suzuki [11], 1974, is the same.

Table III. Flow of Funds Table (Stocks) for Indirect Finance Model

		Bank of Japan	Commercial Banks		Corporations	Households	Total
			City	Local			
(A)	Currency	-M	M_{cb}	M_{lb}	0	M_h	0
	Direct Credit	C	$-C_{cb}$	0	0	0	0
(D)	Call Loans	0	$-CL_{cb}$	CL_{lb}	0	0	0
(E)	Loans	0	L_{cb}	L_{lb}	$-L_c$	0	0
(B),(C)	Deposits	0	$-D_{cb}$	$-D_{lb}$	D_c	D_h	0
Real Assets		0	0	0	PK_c	0	PK_c
Total		0	0	0	0	NW $(=M_h+D_h)$	PK_c=NW

See notes to Table II. "Currency" here includes deposits of banks at the Bank of Japan.
New Notation: CL: Call Loans
L : Loans
D : Deposits

while (F)-type assets themselves disappear. For households, the investment assets are deposits, type (B), and quasi-money, type (C). For banks, the investment assets are risky, free rate, marketable, indirect securities of type (D) such as call loans, and risky, free rate, bilateral, primary assets (E) such as loans. Currency is supplied by the central bank through "direct credit", i.e. central bank loans.

This indirect finance model has five of the types of assets listed in Table I, that is (A)-, (B)-, (C)-, (D)-, and (E)-type assets. Of these (A)-, (B)-, and (C)-type usually have controlled interest rates, while (D)- and (E)-type usually have free rates. But in high growth Japan, the "prime rate" on loans and the official discount rate were tied by a mechanical formula, and were controlled at low levels under the artificial low interest rate policy. Hence, even loans not subject to the prime rate, which are usually free, had a tendency to be sticky. It is more realistic for this model to treat (E)-type assets as having controlled rates.

The channels of transmission of effects of monetary policy in this model are as follows.[10] When the Bank of Japan lowers the level of direct credit to banks

10. For a detailed description of the monetary policy transmissions channels in this model, see Suzuki, [11] particularly Chapter 14.

(in this model to city banks), the call market tightens and the call rate rises. But since the interest rate on loans to customers of the banks is sticky under the artificial low interest rate framework, the banks look at the high call rates and reduce lending to customers in favor of sending money to the call market (or repaying call loans in the case of city banks). As a result, there is a quantitative reduction in lending to customers, and hence in the money supply; through this the tightening effects permeate to expenditure activities on the real side. For a monetary easing, the path is: Rise in Bank of Japan Lending → Fall of the call rate → Rise of lending to bank customers.

Separating the banking sector into city banks and local banks, introducing a call market, having the Bank of Japan adjust its policies with the call market in mind, and using the movements of the call rate to analyze policy effects was a way of thinking that has been used by many since its introduction in Suzuki [10].[11]

Where, then, are the qualitative differences in channels of transmission of policy effects in the indirect finance model and the direct model given earlier? First, the original impact of a change in central bank credit is felt in the *interbank market's free rate* for the former, but in the *open market free rate* for the latter. But both models have the common point that the impact is felt on marketable, free-rate, risky, investment assets. The difference is that these are (D)-type indirect securities in the indirect model, and (F)-type primary securities in the direct model.

Second, the transmission channels are different. For the indirect model, movements of the interbank rate affect banks' asset selection, and change the quantity of credit provided, and hence the money supply. Through this, the expenditure decisions of economic agents are indirectly affected. In contrast, in the direct finance model, the change of the open market rates directly affects the expenditure decisions of agents. Thus, the third difference is that the indirect finance model does not limit effects on agents to those through interest rate movements, but rather generates quantitative reductions of credit or money, such as "credit crunches". In the direct finance model, agents are affected primarily through interest rate changes.

These differences are important when we come to discuss the effects of financial innovations on policy influence.

11. Among those who have examined and developed the model in Suzuki [10], 1966, are Rōyama [9], 1969, Moriguchi [6], 1970, Tachi and Hamada [13], 1972, Suzuki [11], 1974, Hamada and Iwata [3], 1980, and Horiuchi [4], 1980. The author owes a great deal to these research results.

Table IV. Flow of Funds Table (Stocks) for Mixed Direct/Indirect Model

Financial Assets			Bank of Japan	Comm. Banks		Corpo-rations	House-holds	Govern-ments	Total
Type	Description	Interest Rate		City	Local				
(A)	High Powered Money	0	-	+	+	+	+	0	0
	Direct Credit	r	+	-	0	0	0	0	0
(B),(C)	Deposits	r_D	0	-	-	+	+	0	0
(D)	Bills sold by banks and Call Loans	r_C	+	-	+	0	0	0	0
(E)	Commercial Loans	r_L	0	+	+	-	0	0	0
(F)	Securities	r_B	+	+	+	±	+	-	0
Real Assets/Wealth						+	-	+	0

Note: + indicates assets, - liabilities. For real wealth row, + indicates real assets, and - wealth.

D. A Mixed Direct and Indirect Finance World: – The Contemporary Japanese System –

Open markets have been developing gradually in Japan since the last half of the 1960's. The basic backgrounds for this development are the structural changes in flow of funds (e.g. large-scale government bond flotations and higher internal financing by firms), internationalization of finance, and the liberalization of interest rates that has accompanied these trends. With the decline of indirect finance in the last half of the 1970's, the development of direct finance is accelerating.

The outlook is for the money market (open market in short term assets), comprising repurchase, treasury bill, and CD markets, to develop further. Even the open markets in long term bonds are expected to develop further, as the quantity and diversity of long term bonds that have accumulated in the market grows, and as rollover operations become standard occurrences.

It is only natural under the circumstances for the inconsistencies between the open market rates and the controlled rates in the indirect assets (e.g. deposit rates, financial debenture rates, expected yields on loan trusts, the prime rate on loans) to grow; this will become the impetus to further decontrol.

For a financial system that is a mix of a direct finance system and an indirect one, discussion of the channels of transmission of monetary policy effects requires integration of the direct and indirect models given above.

The way to do this is to add the (F)-type assets of Table I, which were excluded when we moved from the direct system of Table II to the indirect finance system of Table III, back into the system of Table III. The (F)-type assets which did not exist in the indirect finance system are marketable, free rate, risky, investment assets, and their addition brings open markets into the model.

These (F)-type assets (here represented by securities) are held by the central bank, corporations, banks, and individuals, i.e. by all sectors. They were the liabilities of the corporate sector. To avoid overcomplication of the model, we omitted the public sector; but the securities issued by the public sector are central to the existence of the securities market, so a realistic model would have to include them. The flow of funds table for this model are given in Table IV.

In this model, the balance sheets of the Bank of Japan and of the public sector are taken as policy variables, and hence are exogenous. Of the six assets, the interest rate on high powered money is set at zero, so there are six endogenous variables, namely five interest rates and real income, y. With prices assumed given, equilibrium in the six assets markets and in the single goods market (equation (2)′ above) give seven equations; six of these are independent, and determine the six endogenous variables.[12]

Let us start in a period of monetary ease, with controlled rates at equilibrium levels and hence with the system in overall equilibrium. The Bank of Japan decides on a monetary tightening, and recalls direct loans, raises the official discount rate, and sells bills (all these operations in indirect assets), and also buys securities (in open markets), thus reducing high powered money. The system would move to a new equilibrium if all interest rates were free rates, or if controlled rates moved immediately to new equilibrium levels. But in reality there are the following constraints. First, the deposit interest rate, r_D, is determined at an upper ceiling by guidelines. Second, the market rate on loans, r_L, is difficult to move quickly due to the de facto link of the prime rate to the official discount rate and due to the long term relationships with customers that lie behind bilateral assets such as

12. One may conceive of this model as that in Table II with two financial assets and one real assets (the IS-LM model) but with the number of financial asset equilibrium conditions expanded from one to five.

loans. Hence, the loan rate is sticky, and takes a great deal of time to adjust to its equilibrium level. (The discount rate can be thought of as going quickly to its equilibrium rate, since it is supposed to be a shadow penal rate including the Bank of Japan's attitude towards rationing of central bank credit at its discount window.)

Thus, the various measures of monetary tightening force the market into disequilibrium, and real income, y, is affected both through the routes of the direct finance model and those of the indirect finance model.

First, the indirect asset operations by the Bank of Japan, – e.g. recalling loans, raising the shadow penal rate, r, and selling bills – raise the interbank market rate, r_C. The direct asset operations – sales of securities – invite a rise of the open market rate, r_B. Moreover, since there is close arbitrage between these two markets, even if the Bank of Japan restricted credit in only one of them, both markets' interest rates, r_C and r_B, would rise.

The rises of these two interest rates will affect banks' and firms' behavior in the following ways. (1) For the banks, as seen in the indirect finance model, the sticky loan rate will cause restraint in lending, and so corporate activity and hence real income, y, will receive an "indirect" restraining effect from the funds "quantity" side. (2) On the other hand, as seen in the direct finance model, the rise of interest rate, r_B, will directly affect firms and households, and thus restrain income, y. The rise of r_B is not only a rise in the cost of funds for deficit agents, but also a rise in the opportunity cost of expenditure for surplus agents. Hence, expenditure will be reduced.

In the mixed direct/indirect finance model, in addition to the above two channels, there is another channel of transmission: (3) As a result of the rise in the market rate, r_B, while the deposit rate, r_D, remains fixed, both households and firms will strengthen their preference in choice of investment assets for securities over that for deposits, and deposits will not flow into in banks as much as previously. Hence, banks will face a shortage of funds and restrain lending, so that firms' investment activities and hence income, y, will be restrained from the "quantity" side. This reduction in the financial intermediation by banks is called "disintermediation".

These are the three channels of transmission of policy effects in the mixed financial model. There is one interest rate effect, channel (2), and two quantity effects, channels (1) and (3). Of these two types of transmission channel effects, the latter two quantity channel effects rely on the deposit and loan rates being controlled or sticky. That is, the stronger controls are, the stronger effects (1) and (3) are, while the strength of effect (2) weakens. But if controls are weak or if interest rates are decontrolled, effect (2) strengthens, while effects (1) and (3) disappear. Hence, the viewpoint that emphasizes importance of quantity channels

of transmission implies that relaxation of interest controls and interest rate decontrol will harm the effectiveness of monetary policy. But the viewpoint that emphasizes the interest rate channel says that interest rate decontrol will promote the effectiveness of monetary policy.

In what follows, we will dig deeper and examine these two points of view and their implications.

The quantity effects (1) and (3) change money stock from the supply side even before they affect transactions, while the interest rate effect (2) changes simultaneously money stock from the demand side and transactions. This will be an important point when we consider financial innovations in Section III.C below.

II. Prices or Controls?

A. Control Based Monetary Policy

The Disintermediation Mechanism

The proposition that tight money policy functions effectively through disintermediation, and more generally through quantity reductions in bank credit, or more extremely through credit crunches, is clearly minority in the American academic world. But among economists who are close to practicioners, e.g. Wojnilower (first at the Federal Reserve Bank of New York, and currently an economist at First Boston Corp.), this viewpoint is held.[13] For Japan around 1965, both Tachi and Patrick have held that reductions of bank credit based on quantity controls such as "window guidance" have mainly supported the effectiveness of monetary policy.[14] This author has emphasized that the main reason for reductions of bank credit is not window guidance, but rather the rise in the call rate given the controlled interest rate structure.[15] (This is equivalent to the quantity effect (1) mentioned above.) But no matter which viewpoint one takes, there is no doubt that monetary tightening in Japan until about 1965 showed its effectiveness through quantitative pressure on bank credit. The debate was over what mechanism caused the quantitative pressure.

There are in general three types of controls that can cause financial disintermediation, or more extremely credit crunches.

The first is controls on interest rates of (B)-, (C)-, and (E)-type bilateral assets

13. See Wojnilower [17].

14. See Tachi [12], 1965, and Patrick [8], 1962.

15. See Suzuki [10], 1966, especially the introduction and Chapter 4, section 5.

of financial intermediaries. For the case of (B)- and (C)-type assets, there are upper limits on deposit rates, such as the Regulation Q rates of the U.S. (But according to the Depositary Institutions Deregulation and Monetary Control Act of 1980, deposit rates in the U.S. are to be totally deregulated, with the phased abolition of controls through March, 1986.) Japan has always had upper limits on deposit rates controlled by guidelines, and actual deposit rates have actually been at these upper limits.

With controls on the upper limits of (B)- and (C)-type assets, a movement toward monetary tightening will raise the free rates on (F)-type market assets; deposits will become hard to collect, as funds are absorbed in the open money markets and the open bond markets. As a result, financial intermediaries will face a shortage of funds, and will be forced to restrain lending. This is disintermediation (transmission channel (3) mentioned above).

In Japan after 1975, decontrol of interest rates has progressed, and the open markets such as repurchase, CD, and secondary bond markets have expanded. The result has been disintermediation.

But before that, through the decade to 1975, the interest rate on (E)-type assets such as loans was inflexible due to the existence of controlled rates such as the prime rate; hence, when the interest rates on (D)-type assets such as call loans rose sharply, banks reduced lending and put funds into the call market. This put pressure on credit (transmission channel (1) from above).

To summarize the above mechanism: Due to the controls on (B)-, (C)-, and (E)-type bilateral assets of financial intermediaries, changing the interest rates on (D)- and (F)-type free rate market assets move would generate disintermediation.

The second type of control is existence of reserve requirements on (B)- and (C)-type assets. When no interest is paid on reserves (as in Japan, the U.S., and many developed nations), the cost of supplying (B)- and (C)-type liabilities subject to reserve requirements rises; a competitive disadvantage arises for these assets versus (F)-type securities, so that banks cannot offer attractive interest rates to depositors. Thus, deposits become hard to collect and disintermediation occurs (similar to transmission channel (3) from above). But even if interest were paid on reserves, a rise in interbank rates (as in transmission channel (1) above) would still restrain bank credit.

A third type of control is direct quantitative control on bank credit. "Window guidance" (controls on lending growth) in Japan are a classic form of this.

The Bank Credit School and Elasticity Pessimism

The proposition that monetary policy cannot be effective without quantitative pressure generated by disintermediation implicitly relies on one or both of the

following assumptions.

First is the assumption that, when bank credit is quantitatively restrained, other means of raising funds are unavailable so that agents have no choice but to reduce investment. But disintermediation means that the flow of funds from savings-surplus agents to deficit agents shifts from the indirect deposit route to the direct securities route; hence the deficit agents should be able to obtain funds. Moreover, even deficit agents have some investments in the open markets, and will be able to fund real goods investment by redeeming these.

Hence, in order to say that disintermediation causes credit pressure, it is necessary to restrict ourselves to the case that virtually all deficit agents are unable to raise funds through the direct securities on the open market, and that the quantity of own-capital is small. This is the "overdraft economy" of Hicks [5]. Until the mid-1960's, Japan was relatively close to this world.

The second implicit hypothesis is that investment activity is inelastic with respect to interest rates. In this case, the effect of interest rates on activity is small, so that only quantitative controls on credit can make monetary policy effective.

The proposition that the effectiveness of monetary policy is basically due to credit pressure generated from reliance on controls rests on the two assumptions of the "credit paradigm of an overdraft economy" and "elasticity pessimism" about the interest elasticity of investment. If these two assumptions hold, the easing controls or decontrol will certainly lower the effectiveness of monetary policy.

B. Monetary Policy and the Interest Rate Mechanism

The Asset School and Elasticity Optimism

But are these two assumptions plausible? In the U.S. financial system and in the Japanese since 1975, the methods for corporate fund raising have been diverse. In the U.S., in addition to bond issue and equity issue, funds can be raised by issue of commercial papers and bankers acceptances. That is, (F)-type assets have been developing rapidly. Moreover, with internationalization of financial markets, both American and Japanese firms can raise funds in foreign markets easily. Moreover, for many years in the U.S. and since 1975 in Japan, corporations have managed large amounts of own-capital in open markets. In Hicks's terminology, both nations show many elements of the "auto-economy". Hence, disintermediation will not result in immediate quantitative difficulty for corporate fund raising or in investment reduction. If such effects do occur, they are limited to housing loans and consumer credits, or the small group of people with little savings.

Moreover, elasticity pessimism about investment is most likely a leftover from

the 1930's. According to the econometric studies that have developed so rapidly in the postwar period, interest elasticity of investment is high enough.

In Japan, since monetary policy in the period through the mid-1970's worked through quantitative pressure on credit, the interest elasticity of investment could not be ascertained. But in the first monetary tightening of the late 1970's, in 1979-80, investment was clearly restrained as "interest rates worked". At the time the open market rates (opportunity cost of investment) in the repurchase and CD markets rose to 13 or 14 per cent, corporations refrained from redeeming funds from the market and reduced investment. As a result, even when the monetary tightening hit its peak in the second and third quarters of 1980, banks still could not fill their window guidance quotas. At the time some people spoke of "tightness without quantity pressure", that is, interest rates worked to restrain investment before quantitative constraints became binding, so that the window guidance quotas went unfilled.[16]

As seen above, the U.S. for many years and Japan since 1975 have been very much "auto-economies", in the sense that firms have had enough of their own-capital, and fund raising methods other than reliance on domestic credit have developed. Moreover, the interest rate elasticity of loan demand is even higher. Hence, it is a mistake to think that monetary policy cannot function without credit pressure due to disintermediation. We must replace the policy paradigm of the bank credit school and elasticity pessimism with a new paradigm of the asset school and elasticity optimism.

Even if disintermediation were to occur due to controls, an economy with ample financial assets would not see quantitative credit pressure. However, even without causing quantitative credit pressure, monetary tightening effects will permeate the economy if interest rates are flexible.

Thus, even if controls are abolished, and even if disintermediation ceases, the effectiveness of monetary policy need not decline. On the contrary, since abolition of controls will make interest rates more flexible, the effectiveness of monetary policy working through the interest rate mechanism will rise.

Demerits of Disintermediation

As seen above, from the point of view of maintaining the effectiveness of monetary policy, it is meaningless to say monetary policy must be control-based. But monetary policy is not the only question. Continuation of controls also has demerits from the viewpoint of optimal allocation of funds and fair distribution

16. See Suzuki [11] Chapter 2, section 1 for a detailed explanation of the effects of the monetary tightening in 1979-80.

of income. With these questions in mind, let us consider deposit rate limits, reserve requirements, and window guidance – the three types of controls said to have underpinned effectiveness of monetary policy.

First, upper limits on deposit rates imply controls only on the interest rates paid by financial intermediaries for the funds they gather, and ignore the interest rates on the funds they lend (in loans or securities purchase). Hence, at times of credit pressure when there is disintermediation, the rates of return on intermediaries' lendings far exceed those on their deposits, giving rise to excess profits, either latent[17] or actual. This is a sign of unfair income distribution. Moreover, at times of disintermediation, the channels of fund flows from saving agents to investing agents change, and the share of intermediation falls for artificial reasons. This is a sign of inefficient funds allocation.

Required reserves act exactly as a tax, but only on the types of assets against which they must be held. This acts to artificially lower the market share of financial intermediaries which supply these liabilities. This is a sign of inefficient funds allocation. On the other hand, agents who supply similar but non-reservable liabilities reap excess profits, indicating unfair income distribution.

Finally, window guidance artificially reduces the market share of financial intermediaries which are subject to it, indicating inefficient funds allocation. Moreover, if quantitative pressure develops as a result of window guidance, certain intermediaries will reap excess profits, which shows unfair income distribution.

These paragraphs show that the various controls that underpin monetary policy effectiveness all cause the institutions which are subject to control to lose market share, but also cause excess profits somewhere in the financial system. These effects clearly bring inefficient resource allocation and unfair income distribution to the nation's economy.

III. Financial Innovation and Monetary Policy Effectiveness

A. Progress of Financial Innovation

Causes of Financial Innovation

Financial innovation has been touched off by the loss of market share of institutions subject to various controls and by the excess profits existing in parts

17. "Excess profits" are those generated by the existence of controls or oligopoly. These may be only latent in the sense that they are eaten away by "x-inefficiencies" such as not reducing costs enough or by artificially low interest rates on government bonds.

of the financial system. That is, there are movements among the financial institutions losing share to devise ways around controls and develop new financial instruments which somehow avoid controls. Moreover, individual firms in areas where there are excess profits will often sacrifice a portion of those profits in the form of developing a new financial instruments and thereby reap new profits and a larger market share. And in parts of the industry that are not enjoying excess profits, there will be attempts at entry through devising new instruments that threaten the areas where excess profits exist. The process eliminates excess profits, and promotes efficiency and fairness in the sense of equalizing opportunity to trade.

There were two other factors which promoted rapid financial innovation in the U.S. in the 1970's.

First was the rise in inflation. Inflation accelerated substantially, even into double digits. As a result, open market free interest rate soared, and the deviations of these from the controlled. Regulation Q rates reached unprecedented levels. This resulted in accelerated loss of share for financial institutions, and also expanded excess profits in some parts of the financial system. In short, the incentive to innovate in the financial industry rose dramatically. Moreover, customers raced to find inflation hedges, so demand for advantageous new assets was very strong and brought tremendous profits to founders.

But it is wrong to be blinded by inflation and consider financial innovation to be a special phenomenon generated only by inflation. Even had inflation not risen, financial innovation would have been unavoidable to the extent that the aforementioned controls existed and that the technological change (described below) progressed. But inflation did have the effect of making the changes sudden. In this sense, inflation was an accelerating factor behind innovation but not a necessary condition for it.

Indeed, in case of Japan, although inflation rate has been far lower than that in the U.S. for the past few years, financial innovation has been gradually proceeding as described later.

The second factor was the remarkable decline in transactions costs due to the "micro computer revolution." The transactions costs of financial intermediation and the costs of deposit, withdrawal, and transfer of funds declined both through the efficient management of fund acquisition and allocation through on-line systems and through so-called "data telecommunications systems" with customers using telephone lines. Attractive financial instruments developed as a result. This technological revolution occurred very rapidly in Japan, and, as in the U.S., will only increase in importance as the technological impetus to financial innovation.

Thus, financial innovation was induced by loss of share of financial institutions restrained by regulation, by excess profits in some sections of the financial system,

and by technological improvements that reduce transactions costs. Thus, the goals of financial innovations are (a) avoidance of controls, and (b) expansion of market shares. These goals are achieved through (c) sacrifice of excess profit and (d) reduction of costs through technological improvement. The result is rates of return hitherto not available on financial instruments. In what follows, we will look at the detailed structure of financial innovations, based on motives for holding financial assets.

Economization of Transactions Assets

Transactions account assets of (A)- and (B)-types have controlled interest rates, with currency and sight deposit rates at zero and demand deposit rates very low. Hence, there always exists an incentive for a bank wishing to raise its market share to circumvent the interest rate controls and attach a higher interest rate to a transaction account asset.

As seen above, asset selection based on transactions motives takes place between transactions assets and investment assets. Hence if the "round trip" transactions cost between transactions and investment accounts is less than the interest income from holding assets in the investment account just until the day of payment, then investment assets will be held; if not, then transactions assets will be held.[18] Thus, with (c) sacrifice of excess profits and (d) fall of transactions costs causing fall in the transfer fee between transactions and investment accounts, people will economize on transactions assets and increase holding of investment assets. Looked at from another angle, this means paying a interest rate on transactions accounts in excess of the controlled rate. If a bank performs these innovations, then (A)- and (B)-type assets will be economized and all funds will gather in (C)-type quasi-money assets. Moreover, for the part of transactions assets held in risky (F)-type assets, if the transactions cost differential between (F)-type and (C)-type assets is higher than the interest rate differential less the risk premium, then there will be a shift to (C)-type assets from (F)-type assets. Thus many banks, which are losing market share due to control on (A)- and (B)-type asset interest rates at zero or low levels, recover to an extent.

The specific innovations which have brought economization of currency (A) and deposits (B) on one hand and caused accumulation of quasi-money (C) on the other are as follows. Those that help economize currency and deposits are checks and credit cards, automatic paycheck deposit, automatic fee transfers (e.g. utility payments), automatic teller machines, etc.

Those innovations that have caused economization of deposits (B) and shift

18. See Baumol [1] and Tobin [16].

into quasi money (C) are those which promote transfer of funds from quasi-money accounts into deposit accounts for payments when the deposit account runs low. These include NOW accounts, automatic transfer systems (ATS), and telephone transfers.

In Japan this type of innovation is proceeding in the form of changing ordinary deposit (*futsū yokin*) accounts into general accounts (*sōgō kōza*), e.g. by overdraft privileges which use the quasi-money accounts (time deposits and loan trusts) as collateral.

Advent of Safe Investment Assets with Market Rates

Let us next consider financial innovations relating to the investment motive for holding assets. As seen above, the asset selection relevant to the investment motive is between safe investment accounts and risky investment accounts. In the traditional financial system, the safe investment asset is (C)-type quasi-money, with a controlled interest rate. But because of controls, the banks have the incentive to attempt to recover market share by avoiding interest rate controls, sacrificing excess profits, and offering advantageous, safe, investment account assets. In this case, the competition is from (D)- and (F)-type risky, free rate, marketable investment assets. Hence, when (C)-type assets are given market rates, they are more attractive since their expected return becomes the same as that of the competition, and the principal-guarantee of safe assets exists.

Financial innovations that have come into the market with this in mind include six month fixed deposits with interest rates tied to the subscribers yield on six month Treasury bills, namely money market certificates, 2-1/2 year fixed deposits with interest rate tied to the average yield on 2-1/2 year Treasury notes, namely small savers certificates, etc.

Japan has not seen the advent of such accounts yet, but one might call CDs, which Japan does have, a variety of above-mentioned type of new asset.

With banks sacrificing some of their excess profits in order to offer more attractive new instruments and thus raise their market shares, the securities industry will start innovations in order to compete. In fact, to be accurate, the securities industry innovations mentioned below actually came first (threatening banks' excess profits by entry) and bank innovations mentioned above were actually responses.

The assets traditionally handled by the securities industry are (F)-type assets such as government securities, corporate bonds, and equities. These assets have high yields, but have the drawbacks of high risk, large units, and high transactions costs. Moreover, the securities industry cannot combine these with (B)-type assets and give them a transactions aspect. Hence, when the yields on banks' (C)-type assets

equalize with those of (F)-type assets such as money market certificates and small savers certificates, then the (F)-type assets lose their competitiveness.

However, the securities industry has already developed innovations such as repurchase agreements and money market mutual funds (MMMFs). The latter is an "investment trust" which invests the funds it gathers in (F)- and (D)-type assets of the short term money market, i.e. CDs, commercial papers, bankers acceptances, and Treasury bills. In the sense that the fear of capital loss is low, these assets are close to being safe assets, and they also have small unit transactions (500 to 1,000 dollars), are freely convertible, and have no time limits. Moreover, one can also open a demand deposit account at a bank with a hook-up to the securities firm and, when there is a shortage of funds, have funds automatically transferred from the MMMF, and thus give the latter a transactions facility. In Japan the asset similar to MMMFs is the medium term government bond fund (*chūki kokusai fando*). The motivation for securities firms to offer such an asset is to steal away the excess profits of banks.

Avoidance of Reserve Requirements and Window Guidance

The previous sections considered innovations by banks to avoid interest rate controls and those by securities firms in reaction to those of the banks. However, the banks' NOW accounts, though de jure (C)-type savings accounts are de facto (B)-type demand deposit accounts. And the securities' firms MMMFs are formally investment trusts formed of (F)-type assets, but in fact function as (C)-type quasi money. Both function as (B)- or (C)-type assets, that is as deposits. That is, both these assets are innovations which also circumvent reserve requirements.

In response to this fact, there are those in the U.S. who hold that NOW accounts should be required to be backed by the high reserves required for demand deposits, and that MMMFs should be included among reservable assets and thus be backed by the same levels of reserves as required for savings deposits. But this would lead to innovation and expansion of reservable assets chasing each other like a dog chasing its tail. As long as controls exist, attempts to avoid them will continue. For example, a bank can have a subsidiary float commercial papers, or raise funds abroad in the Euro markets, and thus acquire de facto deposits without incurring reservable liabilities. There is an infinite variety of schemes to avoid reserve requirements and interest rate controls through issue of what are formally (D)-, (E)-, and (F)-type assets but are actually (C)-type ones.

One way to ease the incentive to avoid reserve requirements is to pay market rates of interest on reserve deposits. As long as the transactions costs of gathering reservable deposits is not higher than that of gathering other kinds, reservable assets will thus be made at least no less attractive. But if such interest is paid, effec-

tiveness of the cost effect lying behind the reserve requirement system will disappear, and only the liquidity effect will remain; to this extent, the effectiveness of monetary policy will decline.[19]

Innovations to avoid window guidance controls are not a topic of discussion now, but such innovations are possible. One possibility is repurchase agreements based on loan securities. Another is introduction of customers to local banks outside the strictest window guidance controls. Another is introduction of impact loans from abroad through the good offices of the bank. Controls always stimulate human creativity, and generate new innovations. In this sense, window guidance is at the very most an emergency measure for tight money periods, and only acts as supplementary means of speeding up the adjustment process. It should not be continued in period of easy credit.

B. The Financial System of the Future

Innovation will continue so long as there are controls, but, as seen above in Section II on "Prices or Controls?", the continuation of controls is not a necessary condition for effectiveness of monetary policy. Thus it is desirable to ease controls at a pace that is deliberate but will not cause confusion in the financial system, and to eliminate as many controls as possible.

Once controls have been abolished, excess profits have been eliminated, and innovation has furthered the efficiency and fairness of the financial system, what sort of system will exist? We will not reach such a system for some time, but it is meaningful to compare the current state and the most extreme vision of the future in a comparative static fashion, to investigate the problems of the transition period.

Currency: Economization and Continuation

How thorough will be the economization of (A)-type currency in the financial system of the future? It can be conceived that every person will have a bank identification card with a password, with which to order payments for transactions from computer terminals placed in homes or stores or places of business. (This is also known as "home banking" or "firm banking".) But no matter how much technology advances, the transactions costs of using telecommunications systems will not go to zero. Thus, the cost of economizing on cash use will always be positive. As long as that cost exceeds the benefit of economization of cash, the use of

19. For an explanation of the cost effect and liquidity effect of the reserve requirements system, see Suzuki [11], Chapter 12.

cash will continue. In fact, for small transactions, the convenience of cash is quite high. And, though this is a factor of different magnitude, the underground economy will also exist in any world, and it will use cash.

From the viewpoint of monetary policy, the extinction of currency will cause difficulty. Even in a world in which all interest rates are free to fluctuate, the rate of return on currency is fixed, at zero. It is due to the existence of this controlled rate that the general equilibrium system is uniquely solvable, so that the levels of other interest rates are determined. The use by the populace of central bank liabilities in the form of currency with zero interest rate is the foundation of monetary policy effectiveness.

Since the use of currency is a necessary condition for maintaining the effectiveness of monetary policy, one might conceive of the idea that, in order to force the use of currency, reserve requirements should be imposed on all other financial assets. But no matter how much electronic information systems develop, it would still be too complex to keep track of all financial assets (the lending and borrowing of all economic agents) and impose reserve requirements on them. If this is the case, then allowing even a few exceptions to the rule would create new financial instruments that avoid the reserve requirements, and again start an endless fight between controls and innovations. Hence the realistic response is not to broaden reserve requirements, but rather to pay market interest rates on reservable deposits. This proposal does have the defect that the cost factor making reserve requirements effective is eliminated. But in either case, coming to a conclusion is premature, since we do not know how future electronic information and telecommunications systems will develop.

Potential for Elimination of Deposit Money

Even if (A)-type currency continues to exist, what will happen to (B)-type deposit money? It is likely that zero or low interest rate accounts such as those now will continue to exist as flows and play the role of an important transactions account, but will disappear on a stock basis as most are transferred into investment accounts. Recently in the U.S. the advent of "sweep" accounts has shown the shape of this part of the future.

In this type of account, a given level for demand deposits is established; when the balance exceeds that amount, the excess is automatically transferred into an MMMF, and if there is a shortfall this is made up by transfer from the MMMF. The term "sweep" is used because the transactions account is continually "swept clean" at a given level.

What will happen when sweep accounts disseminate widely? The level of (B)-type assets will be equal to the sum of sweep account contract levels, and will be

at this fixed level regardless of transactions needs. If the economization of cash has also proceeded greatly, then the narrow money supply M_1 comprising (A)- and (B)-type assets will lose its relation to economic activity, and cease to moving at all. This will be a world in which transactions balances are almost stationary. Moreover, there is the possibility that competition will drive the balance of sweep accounts to zero. In this case, transactions will be active during business hours, but balances will be swept clean at the end of the business day. Hence, (B)-type assets will disappear from the world, and become (C)-type investment accounts with payments facility. In fact, in the U.S., transactions accounts with market interest rates (such as money market deposit accounts and super NOW accounts) were approved as of December, 1982.

From the point of view of the motivation for holding money, it is only natural that the level of (A)- and (B)-type assets that compose M_1 should shrink with the progress of financial innovation. Transactions motive money is held only because the "round-trip" transactions cost of transfer from the high rate investment account asset exceed the interest earned on the investment asset. And money held for investment motives is held because of the existence of interest income uncertainty of risky investment assets. That is, the holding of money is underpinned by the existence of transactions costs (a market imperfection) and uncertainty about the future (risk aversion). But financial innovations have reduced transactions costs, and have developed safe investment account assets. Indeed, the essence of financial innovation is reduction of transactions costs and reductions of uncertainty about investment account income. Hence, the progress of financial innovation necessarily reduces demand for pure money such as M_1.

The Future of Investment Accounts

Finally, let us consider the future of investment accounts. Probably all (C)-type safe, bilateral, investment assets will come to reflect market interest rates, as do money market certificates and MMMFs. As a result, the expected yield differential between these assets and (D)- and (F)-type risky, marketable assets will be equal to the management costs and profits of banks and securities companies, and the management costs are expected to be very small given the micro-computer revolution. Since most people are risk averse, it is likely that, in choosing a point on their indifference curves, they will prefer innovated safe (C)-type assets to old risky (D)- and (F)-type assets.

Moreover, the choice between investment assets of (C)-type assets on one hand and (D)- and (F)-type assets on the other probably will not be influenced greatly by movements of market interest rates. This is because the interest rates on the two types of assets will fluctuate together, maintaining a fixed spread. Thus interest

rate fluctuation will no longer be able to cause disintermediation (monetary policy transmission channel (3) seen above). But this also means that even if market rates are changed, the level of (C)-type assets cannot be controlled from the supply side.

We have seen that the level of M_1, with (A)- and (B)-type assets, will be low and virtually fixed, while the level of M_2 or M_3, which includes (C)-type assets, will be virtually unaffected by market interest rate fluctuations.

How then will M_2 and M_3 be influenced by interest rates? It is likely that future (C)-type asset accounts will be divided into those that have facility for quick transfer into (B)-type accounts and/or payments facility and those that are pure investment accounts. This is because the transfer and transactions costs of (B)-type assets will never go to zero, despite the computer revolution, and hence these will be (C)-type assets with transfer or settlements facility reflected in lower interest rates or higher fees. In other words, there will be an interest rate differential or fee difference between (C)-type assets with payments facility and pure (C)-type assets.

In summary, the investment accounts that people in the future will hold will be of three varieties, (C)-type assets with payments facility, pure (C)-type assets, and risky (D)- and (F)-type assets. The interest rates on these assets will fluctuate together, with fixed differentials due to transactions costs and risk.

Among these three assets, the (C)-type assets with payments facility will be the ones that reflect the level of transactions in the economy. Hence a newly constructed M_2 or M_3 which includes (C)-type assets with payments facility will certainly have a close correlation with total transactions. Hence, monetary transmission channel (2) from above will affect total transactions through interest rate fluctuations, and will move M_2 and M_3 as well.

C. Financial Innovation and Monetary Policy

Using the view of the future given above, we can discuss the problems of financial innovation in the period of transition.

The first problem is the change in the nature of intermediate targets of monetary policy, the money supply indicators. The growth rate of M_1 is falling on trend, and gradually reducing its level of variance; hence, it will continue losing its meaning as an indicator of the level of transactions. In the U.S. in 1981, the actual level of M_1 continually undershot its target level. This was because the downward shift in the M_1 demand function due to the progress of financial innovation was overlooked.

The broader measures of money, M_2 and M_3, will increasingly become (C)-type assets reflecting market rates, so that their sensitivity to fluctuation of interest

rates will fall (i.e. decline of interest elasticity of demand and elimination of monetary policy channel (3) above). From the viewpoint of investment asset selection, there will be expansion in attractive, high interest rate, safe assets such as MMMFs and money market certificates, and because these are included in M_2 and M_3, there will be a trend increase in the growth of these aggregates (outward shift of the demand curve). In the U.S. in 1981, M_2 was continually skirting on the upper end of its target range. This was because the decline in the interest sensitivity of M_2 and the trend increase in growth were overlooked.

As financial innovations progress, these changes in the character of the money supply imply that M_1 will gradually become inappropriate as an intermediate indicator. And efforts should be made immediately to create M_2 and M_3 series that include newly developed (C)-type assets. If possible, it would be desirable to create a time series that includes only (C)-type assets with transfer facility and (C)-type assets with payments facility, and, adding these to M_1, to make the new series for M_2 and M_3.

However, even with these efforts, new M_2 and M_3 will still differ from their predecessors in two ways. The first is that control of M_2 and M_3 from the supply side through the fluctuation of interest rates will become impossible. As seen earlier, monetary policy transmission channels (1) and (3) based on controls will disappear with deregulation. This means that M_2 and M_3 will move to reflect demand. That is, M_2 and M_3 will move along with total transactions, so that they cannot be expected to function as leading indicators for policy of nominal income or prices.

Here is where we hit the second problem for monetary policy. Does the fall in the controllability of the money supply imply a decline in the effectiveness of monetary policy? And will the money supply completely lose its meaning as an intermediate indicator?

The decline in the controllability of the money supply is due to the change of interest rates on (B)- and (C)-type safe, indirect, bilateral assets from controlled rates to free rates. As seen above, the policy transmission channels (1) and (3) which depend on controls will decline in importance, and channel (2) which relies on the interest rate mechanism will strengthen. The implication of this for policy is, as seen in Section II on "Prices or Controls?", that monetary policy effects will strengthen, and not weaken.

On the other hand, the loss of money's ability to be a leading indicator will certainly mean reduction of its role as an intermediate indicator. But it will have the qualities of an accurate, immediately available, and coincident indicator, and hence will not loose its importance as an essential indicator for monetary policy. To this extent, policy focusing on money supply will continue.

Looking back over time, the development of the financial system in Japan

has been accompanied by changes in the operating target among the monetary aggregates from bank notes to bank lending, from M_1 to M_2 or M_3, and then to these plus CDs. It should be no surprise if the internal composition of the money supply continues to change as financial innovation progresses. The critical point is to be cautious enough not to allow this to occur at an uncontrollable or unpredictable speed. As long as the speed is slow enough that changes in the character of money can be reflected in revisions of money supply data, and as long as money demand shifts can be understood as a type a special effect versus the same period of earlier years, there need not be any confusion in monetary policy. In the meantime, the effectiveness of monetary policy will be preserved by transmission channel (2) discussed in the section on the mixed direct and indirect financial system. This is because, in the process of improving the efficiency of the financial system, the interest rate mechanism will function better, and the effects of interest rates on the choice between financial assets and real assets will strengthen.

Because of the continued existence of many controlled interest rates in Japan, the degree of financial innovation achieved so far is relatively low compared to that in the U.S. Interest rate regulations on deposits still remain except for CDs of large denominations, and interest rates on newly issued bonds and bank debentures are still strongly influenced by the guidance of the Ministry of Finance except for tender issues of 2- to 4-year government bonds.

However, a crucial time will surely come around 1985 when further deregulation will become inevitable. Large scale issue of 10-year government bonds began in 1975. This means that a large scale refunding will start, and gross government bond issues will increase tremendously from 1985. This also means that in the secondary bond market there will be a lot of government bonds with maturities of less than 2 years. These bonds will become very competitive with time deposits at banks which have regulated interest rates. And since there is a strong possibility that banks will be allowed over-the-counter sales of secondary market bonds and of newly tendered medium term government bonds, the competition is likely to intensify.

Without deregulating interest rates on newly issued 10-year bonds, the government will not be able to continue their issue. Needless to say, a differential between market rates and guided rates is essentially a tax on syndicate members, and they will not be able to withstand such a large de facto tax. Also, without deregulating interest rates on deposits, funds would shift from bank deposits to government bonds with short maturities in the secondary market. Banks would not be able to tolerate such a decline in market share.

Another development in 1985 will be the start of an Information Network System sponsored by the Nippon Telephone and Telegraph (Japanese counterpart of AT&T in the U.S.). With this, it is possible that computers at banks and

securities firms will be linked with those at their customer companies, and with terminals at business offices and homes; in other words, office banking and home banking will start with a further decline in the cost of financial transactions due to this Information Network System.

Thus, the 1980's will push innovation in and decontrol of Japanese financial markets further, and the Japanese financial system and transmissions channels of monetary policy will develop along the lines described in this paper.

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