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FINANCIAL INNOVATION, MULTINATIONAL BANKING, AND MONETARY POLICY

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The subject of the paper is the causal chain from financial innovation to multinational banking and further on to the conduct of monetary policy. The second section identifies the salient features of the present phase of financial innovation. The third section analyzes the consequences for the structure of international banking. The remaining three sections discuss the probable implications for, respectively,

(1) the alleged 'disturbances from international capital flows (which, it is argued, are usually overestimated),
(2) the effectiveness of monetary policy (where the principal consequence seems to be the competitive dismantling of discriminatory regulation), and
(3) the viability of intermediate targets (which is impaired).

1. Introduction

The subject of this paper is the causal chain from financial innovation to multinational banking and further on to the conduct of monetary policy. The second section identifies the salient features of the present phase of financial innovation. The third section analyzes the consequences for the structure of international banking. The remaining three sections discuss the probable implications for, respectively, (1) the alleged disturbances from international capital flows, (2) the effectiveness of monetary policy, and (3) the viability of intermediate targets.

2. Financial innovation

2.1. The immutability of basic products

The present period is often (and with good reason) described as one of rapid financial innovation. Yet the nature of innovations in the financial industry is quite different from those in other industries. There are, essentially, three basic products or services. One consists in the exchange of present money against future money. Another is the bringing together of borrowers and lenders. The third is the execution of payments on behalf of customers. Even the most complex financial arrangements can usually be described as 'bundles' of these standard products. While the bundling and

unbundling exhibits an infinite variety, the basic products themselves have remained largely unchanged since late medieval times and perhaps since antiquity. Except for electronic technology, if an experienced banker from medieval Venice or Genova came to life again, he could understand the operations of a modern bank in a matter of days.

2.2. *Adaptive innovation*

Financial innovation largely consists in the development of new ways of bundling the basic services [see Dufey and Giddy (1981, p. 3)]. For the most part, such innovations are just entrepreneurial adaptations to changing market conditions. Rather than to new drugs, they are comparable to the adjustment of crops to changes in agricultural prices. I shall call these 'adaptive' innovations.

Although adaptive innovations may produce profound revolutions in the structure of the financial system, they are, in principle, reversible. If the underlying conditions disappear, they will, in due course, disappear as well. Adaptive innovations also tend to be country-specific. While market conditions in the United States may cause a pronounced decline in the proportion of money in total liquid assets, different market conditions in another country may simultaneously produce a shift in the opposite direction. As a matter of fact, recent innovations were much more pronounced in the United States than in other countries with highly developed financial systems. Since the available technology was presumably similar, this points to the preponderance of institutional factors reflected in market conditions.

In recent decades, adaptive innovations were mainly reactions to the combined forces of inflation and interest ceilings. These were, so to say, the hammer and the anvil that forged the financial system into its present shape and helped to give it its increasingly international character. This development was associated with the introduction of the roll-over technique, which made it possible to finance long-term commitments at a succession of short-term interest rates.

Once domestic interest ceilings are lifted and/or inflation has disappeared, the internationalization of banking may develop a tendency to weaken again. The effects of the International Banking Facilities on Euromarkets illustrate this point. However, the reversibility is likely to be only partial, at least over a time span of, say, a decade. Even if all the conditions that originally contributed to the growth of Euromarkets disappeared overnight, the Euromarket would not decline with anything like the speed with which it grew up. There is some sort of hysteresis effect. Its main source is the widespread realization that the efficient location of financial activities is highly sensitive to regulation. Seemingly small changes in regulation can

have large effects on the comparative advantages of financial centers. Once this lesson is learnt, banking firms will wish to maintain a structure that provides insurance against future changes in the regulatory environment. The trend toward multinational banking may thus turn out to be relatively permanent even if the immediate reasons for the emergence of external currency markets may, for a time, become weaker.

2.3. *Technological innovation*

Besides adaptive innovations, there are 'technological' innovations. The core of financial technology is the storage, retrieval and transmission of information. An early breakthrough was the development of double-entry bookkeeping in late medieval times, providing the basis for the capitalist firm and modern banking. The present stage is characterized by the electronic revolution. While the Venetian banker would catch up with adaptive innovations in a matter of days, catching up with technological innovations would keep him busy for years. The common denominator of technological innovation is the reduction in transaction costs. This takes place at three levels.

First, there is a reduction in the costs of *interpersonal cash transfers* through electronic transfer systems. This increases the utility of demand deposits relative to currency. In the limit, currency would become obsolete, but this stage will not be reached in the foreseeable future. From the point of view of this paper, the significant aspect of the lowering of cash transfer costs is its dependence on the size of the payments system. If transfer costs are lower among participants of the same system than between participants of different systems, centralization is more efficient than decentralization. In addition, the scale economies of a centralized system increase with the number of participants. This introduces important scale factors into the innovation process.[1] To the extent transfer systems are maintained by individual banking firms, scale economies imply an irresistible trend toward multi-branch banking and concentration. There seems to be no intrinsic reason, however, why transfer systems should generally be coextensive with banking firms. At least within the same economy, the trend is more likely toward a separation between a number of banking firms of various sizes and a centralized transfer system, possibly operated as a public utility or a cooperative venture of banks.[2]

The second aspect of transaction cost reduction concerns the *interpersonal transfer of interest-bearing assets.* Recent improvements in money-market technology have increased the ease with which assets can be transferred and

[1]Empirical findings on scale economies in electronic funds transfer systems are reported in Walker (1978).

[2]For a comprehensive survey of related problems see Hopton (1983).

have reduced transaction costs. By and large, this tends to increase the demand for non-monetary assets relative to cash balances. It also reduces the supply of interest-free short-term credit. It has long been recognized that transaction costs on interest-bearing assets are one of the basic determinants of the demand for money. If they gradually decline toward zero, individuals and firms find it profitable to invest any cash balances even for very short periods and cash balances would tend toward zero, too. The same would, of course, be true for bank reserves held with the central banks, provided they are not subject to reserve requirements and do not earn interest. The decline in transaction costs on interest-bearing assets may also be expected to make asset arbitrage more perfect. The critical yield differential at which one asset is substituted for another is lowered.

The third aspect of technological innovation concerns the cost of *inter-branch transfers*. It seems plausible to assume that inter-branch costs are significantly lower than inter-bank costs. This creates an incentive for branch banking, including branch banking across international borders. It also seems likely that the transactions and communications costs among branches of the same bank are declining relative to those between different banks. This would progressively strengthen the incentive for branch banking in the course of time. The general result is the increased perfection of asset arbitrage.

3. Multinational banking

International banking typically develops in three stages. First, a bank accepts deposits from foreign sources and/or makes loans to foreign borrowers in its own domestic currency. This may be called the foreign-customer stage. In the second, or foreign-currency stage, a bank accepts deposits and/or makes loans in foreign currency. On a global scale, it was reached with the advent of Euromarkets. In the third, or foreign-branch, stage, a bank maintains its own foreign branches. This is the stage of multinational banking. While it has a long history, it now seems to be in a period of rapid expansion. Clearly, the three stages cannot always be neatly separated and in individual cases their order may actually be reversed. The distinction helps, however, to focus attention on specific aspects of multinational banking.

In principle, the motives for the emergence of multinational banks are the same as those for the development of multinational firms in other industries.[3] The analysis of multinational firms has to answer two questions, namely, (1)

[3]Grubel (1977), and Gray and Gray (1981) explain the emergence of multinational banks in the light of a theory of multinational firms. A general framework for the analysis of multinational firms is provided in Niehans (1977).

why different stages of a productive process take place in different countries, and (2) why these stages are nevertheless united in the same firm.

3.1. Comparative political advantage

The first problem belongs to the pure theory of international trade. In the case of multinational banking, it is simplified by the fact that comparative advantages, in the sense of natural resources, climate and factor endowments, play only a subordinate role. It is remarkable how financial centers seem to develop out of nothing almost anywhere if political and regulatory conditions are right. As a consequence, the pure theory of international trade does not tell us very much about multinational banking. It essentially tells us that in financial intermediation across international borders it is often informationally efficient for customers to deal with nearby banks. As a consequence, financial intermediation between ultimate borrowers and ultimate lenders in different countries tends to involve a chain of banks and thus a 'wholesale' stage.

The principal determinant of the international location of financial services seems to be government action, be it legislative, administrative or judiciary. Financial services, precisely because they are not strongly dependent on comparative advantages in the usual sense, are highly sensitive to the regulatory environment. Small differences in legislation, banking regulation and the like can decide on the viability of certain activities in a given country. It may be appropriate to label these factors 'comparative political advantages'.

3.2. International integration of firms

It is clear that neither the proximity of ultimate customers and their banks nor comparative political advantage necessarily requires multinational banks. In principle, all wholesale business could be handled by independent correspondent banks, and in each location national banks could be specialized according to comparative political advantage. This raises the second problem: what forces lead to the integration of financial intermediaries in different countries in the same multinational firm? For an answer we have to look to the theory of industrial organization. The most general answer is that the whole of the multinational bank must be worth more than the sum of its separate parts. More specific answers can be found at different levels.

A first group of motives are *economies of firm scale*. With respect to both withdrawals of deposits and defaults on loans, banks are subject to the law of large numbers. This means that, other things equal, large banks have lower risks and, therefore, are more efficient than small banks. (Of course,

precisely for this reason, other things are usually not equal in small and large banks.) From this point of view, multinational banking may simply be a means for a bank to achieve a more efficient size. It is doubtful, however, whether this motive can be very strong. In large economies like the United States it is probably negligible, because the domestic market is amply sufficient to permit optimally-sized banks. In small economies it is potentially more significant. After all, multinational firms are the small country's way to obtain the benefits of large firms. But even in a small economy like that of Switzerland only modest fractions of deposits and loans are generated by foreign subsidiaries.

In fact, the chain of causation may well run in the opposite direction, as suggested by the product-cycle model. Small banks may be content with foreign correspondents. With growing size, they become able to maintain their own wholesaling subsidiaries. Finally they may even enter foreign retail banking. From this perspective, the fixed set-up cost of foreign branches acts as a brake to multinational banking at low levels of operations.

A second, and probably more important, group of factors are the *imperfections of the market for information.* As noted above, the core of banking technology is the storage, retrieval and transmission of information. It generally turns out that the transmission of information is easier and cheaper within the firm than between firms. There is, indeed, a market for information on creditors and debtors, but it is very imperfect and the prices are unlikely to approximate the competitive ideal. In the financial sector, in particular, the intra-bank flow of information is likely to be much better than the inter-bank flow. It is surely possible for different subsidiaries of a multinational firm to use different banks. These banks could then sell each other their bits of information about their common customer — presumably at a price. It is clear, however, that this would be an uneasy relationship, each bank fearing to lose out to the other. This situation is avoided if subsidiaries of the same multinational firm deal with subsidiaries of the same multinational bank. In view of the imperfection of the market for information, multinational firms thus create an incentive for multinational banks.

This factor may still be overshadowed by the third factor, namely the *diversification of political risk.* Political risk may be defined as the risk of future changes in comparative political advantage. If this risk were not taken into account, the international structure of banking would shift very rapidly, firms dying in one location while springing up in another. However, once banks have learnt to understand political risk, they will try to reduce it by international diversification. What for national banks could be a matter of life and death may thereby become a matter of mere shifts in activities between branches. Depending on taxes, liquidity regulations and the like, deposits with a given bank may be legally held in Frankfurt, New York or in

the Caribbean. By maintaining a network of foreign subsidiaries, a bank may thus be able to adjust rapidly and at low cost to changes in political advantages. The global result of this trend is a decentralization of financial activities. According to the traditional view, forcefully represented by Kindleberger (1974), the historical trend is towards the formation of financial centers. Present developments seem to be dominated rather by centrifugal forces.

4. The great capital-flow confusion

4.1. The traditional argument

It has been argued in the preceding sections that the expansion of multinational banking is likely to be associated with a further improvement in international asset arbitrage. Given yield differentials would produce increasingly large asset shifts. In the current literature on international monetary economics, such asset shifts are usually interpreted as international capital movements. Under floating exchange rates, such capital flows have a necessary counterpart in trade balances, capital inflows being associated with trade deficits while outflows are associated with surpluses. Trade balances, in turn, can produce profound disturbances in the national economies. It seems to follow that the improvement in asset arbitrage threatens to expose national economies to an increasing risk of international disturbances.

This diagnosis often leads to the prescription of artificial impediments on asset arbitrage. The leading example of such impediments since the widespread restoration of convertibility was the U.S. Interest Equalization Tax. Impediments of various kinds were also imposed by other countries on both inflows and outflows. In recent years, notable economists have proposed special 'counter-speculative' taxes on international asset flows [Modigliani (1973, pp. 252–253), Liviatan (1983)].[4]

The reasoning underlying such proposals was clearly set out by Meade (1951, p. 103). If, in an experiment, interest rates in country A are reduced relative to those in country B, B's borrowers have an incentive to borrow in A rather than in B, and asset holders in A will shift their funds from A to B. The 'new view' of international capital flows, initiated by Branson (1968, 1970) and others, interprets this as an increase in the desired stock of net foreign assets of country A.

The paradigm of this mechanism seemed to be provided by covered interest arbitrage. In the case of forward purchases of sterling against dollars, sterling is borrowed while dollars are lent. This appears to involve a flow of short-term capital from England to the United States. Forward sales of

[4]Dornbusch (1982) also refers to an unpublished paper by Tobin (1978) which, however, was not available to me.

sterling, on the other hand, appear to be associated with a flow of short-term funds in the opposite direction. Keynes (1923, p. 125f., particularly p. 149f.) seems to have initiated the tradition of regarding short-term capital flows as controlled by deviations of exchange rates from interest parity. Further developed by Spraos (1953, pp. 87–92), Tsiang (1959) and Branson (1968), this tradition dominates the literature on capital flows to the present day.

4.2. The difference between arbitrage and capital flows

The centerpiece of this tradition is the identification of arbitrage with capital flows. I believe that this identification is not justified and that the traditional view is thus fallacious. It has always been recognized that financial capital flows between two countries have a necessary counterpart in relative shifts in real capital goods and/or wealth between their residents. Purely financial transactions, no matter how large, do not have the power to move a single dollar's worth of net capital across national borders. Whatever a banker can accomplish in a few minutes on the telephone is surely not a net capital flow.

Forward exchange operations, in particular, far from being a suitable paradigm for capital flows, are the paradigm of financial transactions that produce no net capital flows. In covered interest arbitrage, foreign borrowing and lending are precisely matched by forward commitments, leaving the net foreign asset position of each country unchanged.

The same is true for financial asset arbitrage in general. Consider Meade's experiment and suppose the interest differential results from an offer of the central bank in A to buy A-securities in exchange for B-securities on more favorable terms than before. The result would simply be an exchange of securities between that central bank and private residents in both countries, leaving net foreign assets in the balance-of-payments sense unchanged.

Correspondingly, the elimination of an interest differential through arbitrage requires neither an increase in A-wealth relative to B-wealth nor an increase in the real capital stock in B relative to A, which means it requires no net capital flow. A-capitalists do not have to buy securities from B-capitalists. Capitalists in both countries are simultaneously trying to do the same thing, namely, to buy B-securities and to sell A-securities. The speed with which their efforts bring interest rates in line again has nothing to do with export or import surpluses and thus with genuine net capital flows.

This can also be seen from another point of view. Net capital flows in the balance-of-payments sense have to do with payments and receipts of A-residents in their transactions with B-residents. Arbitrage, however, has nothing to do with residency. It can take place among A-residents and among B-residents even in the absence of any transactions between the two groups. It follows that security arbitrage does not imply capital flows in the

balance-of-payments sense. All it implies is shifts between different financial assets with the same net foreign asset position.

There is no particular relationship between the promptness of arbitrage and the mobility of net capital flows. The first depends mainly on transaction costs and, in many financial markets, may be close to infinity. The second depends on the speed with which households adjust actual wealth to desired wealth through saving and on the speed with which the actual stock of real capital goods is adjusted to the desired stock through investment. There is little evidence that these two speeds are higher today than, say, in the 19th century and they may well be lower. Despite the near-infinite speed of arbitrage, the mobility of capital flows may actually have declined.

If this criticism of the traditional view is valid, the gradual improvement in asset arbitrage through international banking has no clearcut implications for the disturbance of national economies through capital flows. I believe, in fact, that there is hardly any evidence that the emergence of Euromarkets and multinational banking had clearcut effects on net capital flows and thus on trade balances. The argument for impediments on capital flows is correspondingly weak. Asset arbitrage can indeed produce serious exchange rate fluctuations and these fluctuations may well produce real disturbances, but the relationship between exchange-rate overshooting and net capital flows is unclear and the effectiveness of arbitrage impediments against exchange-rate overshooting has not been demonstrated.

5. The effectiveness of monetary policy

Concern has often been expressed that Euromarkets, by providing external markets for dollars, have weakened the effectiveness of U.S. monetary policy. Multinational banking would presumably lead to an additional weakening of monetary policy. The question is whether this is true.

5.1. The continued effectiveness of market action

To get the problem in sharp focus, it is useful to distinguish two types of policy measures. In one case, the central bank acts, in principle, like any other bank, buying or selling financial assets in the market. Such measures may be called 'market actions'. Open market operations and foreign exchange operations are prime examples. In the other case, the government or the central bank imposes regulatory constraints on financial intermediaries and possibly other agents. Such measures may be called 'regulatory actions'. Reserve requirements, interest ceilings, taxes, credit rationing schemes, and restrictions on foreign borrowing or lending serve as examples.

The efficacy of market actions is not impaired by Euromarkets and multinational banking. If the Federal Reserve sells treasury bills in the open

market, dollar liquidity contracts regardless of multinational banking. There is no escape from market actions by moving funds from the New York branch to the London branch of a multinational bank. The tightening of dollar liquidity will immediately be reflected in higher dollar interest rates in external markets as well as at home. Of course, depending on the structure of financial markets, the precise quantitative effect may be somewhat different, but the significance of such differences is minor and it is virtually impossible to make general statements about it. With respect to market actions, the fear of weakening of monetary policy by the expansion of multinational banking is unfounded.

This means that in the presence of a highly efficient multinational banking system, open market operations will have, by and large, the same effects on domestic liquidity, output and prices as they would have in its absence. Conversely, the expansion of multinational banking, taken by itself, is unlikely to have significant effects on domestic liquidity, output and inflation. In particular, the expansion of multinational banking cannot be taken as an indication of liquidity creation and of a consequent potential for inflation.

5.2. The extension of protective regulation

Regulatory constraints present a different picture. Multinational banking has clearly eroded their effectiveness and continues to do so. Asset holders may not vote with their feet, but they certainly vote with their checks, and usually they vote against regulation. The growth of external money markets has tended to reduce the share of liquid assets subject to U.S. deposit insurance, and the advent of money-market funds has accelerated this development [Mayer (1982, p. 29)]. Assuming unchanged regulations, the proportion of deposits subject to interest ceilings and reserve requirements has certainly declined.

The question is whether this erosion of regulation is desirable. The clarity of the answer, while imperfect, can be somewhat improved by introducing a further subdivision. Regulatory constraints seem to have two objectives. In part, they are designed to protect the bank's creditors; these may be called 'protective regulations'. Liquidity requirements, deposit insurance and equity requirements are obvious examples. Other regulatory constraints are intended to be used as instruments of monetary policy. They may be labelled 'policy regulations'. Thus minimum-reserve requirements came to be widely (but falsely) regarded as 'classical' tools of monetary policy in the early post-war period.

From the point of view of the present argument, the significant feature of protective regulation is the fact that those who have to bear its cost also reap its benefits. Consider deposit insurance. It surely adds a cost to bank operations and thus reduces the market rate on bank deposits. Nevertheless,

the supply of deposits may increase rather than decline because the interest cost has a counterpart in the reduction of risk. Similarly, government supervision of bank liquidity, though perhaps reducing deposit interest, may make a banking system more attractive to depositors. While an exact calculus of benefits and losses would be complicated, it is clearly not true that banks subject to such protective constraints are necessarily at a disadvantage.

The main economic objective of protective regulation is the avoidance of banking crises. To the extent that recent developments, as suggested above, have weakened protective regulation, they may have made the financial system more vulnerable to crises.[5] The necessity of emergency measures by the International Monetary Fund, the Bank of International Settlements, central banks and groups of commercial banks to forestall the consequences of international defaults illustrate this point. An adaptation and extension of protective regulation to the new forms of loans and deposits may thus be an important point on the agenda of banking policy. Inasmuch as well-designed protective regulation is a public good provided by the government to both the banking industry and the public, there may be considerable pressure for such an extension.

5.3. The competitive dismantling of policy regulation

For policy regulation, the implications of multinational banking are likely to be different. There are strong reasons to believe that the forces of international competition will lead to its progressive obsolescence.[6] The basic reason is the discriminatory character of policy regulation, arising from the fact that the costs of regulation are not balanced by useful services. If certain banks are subject to minimum reserve requirements, their share of the total banking industry will shrink while other financial intermediaries expand. If domestic banks are subject to policy regulation, financial intermediation will tend to emigrate.

Once this is recognized, nations inevitably begin to compete for the location of financial services within their borders. In the early postwar period, after a quarter-century of disruption in international financial markets, it tended to be taken for granted that financial intermediation is relatively immobile. The great lesson of the last 25 years is that it is, in fact, highly mobile. An excise tax can make or break a national gold market, a withholding tax can prevent the development of a national money market, etc. Under the impression of this experience, the elimination of discriminatory regulation will, I think, increasingly be used as an instrument of international competition. Recent changes in U.S. banking legislation,

[5]This has been emphasized by Guttentag and Herring (1980).

[6]This point has been made forcefully in the excellent paper by Giddy and Allen (1979).

including the provision for International Banking Facilities, provide telling examples. The misgivings of the Swiss legislature about higher banking taxes is another illustration. Countries that try to resist this trend will be punished by a shrinking of their financial industries.

Naturally, there will be efforts to reach international agreements on discriminatory regulation. American efforts to gain European support for the coordinated regulation of Eurodollars are a case in point. In view of the competitive situation, such efforts to construct 'regulators' cartels' do not look promising. A country, reluctant to kill the goose that lays the golden eggs, will usually be only too happy to profit from another country's regulative zeal.

By and large, the progressive obsolescence of discriminatory regulation should be welcome. There has long been wide agreement among economists that the allocative and distributive effects of interest ceilings are unfortunate [Tobin (1970, p. 5)] and that such ceilings are not a useful or effective instrument of monetary policy [Friedman (1970, p. 32)]. There is also growing recognition that legal requirements on bank reserves held with the central bank are neither necessary as a monetary policy instrument nor, since they amount to a discriminatory tax, conducive to an efficient banking system. Direct impediments on international asset arbitrage have been conspicuous by their general lack of success. Overall, the rapid development of international banking has contributed to the efficiency of the participating economies. One specific contribution was the progressive undermining of distorting, and thus inefficient, regulation. It is to be hoped that the future development of multinational banking will bring further progress in this direction.

6. The reappraisal of monetary targets

The third group of policy problems concerns the use of monetary targets. Their common denominator is the increased substitutability between various types of financial assets, including monetary assets. The implications are found at different levels.

6.1. Changing interest elasticities?

At one level, it was argued that the reduction in transaction costs increases the interest-elasticity of the demand for money, thus flattening the LM curve. This would increase the output fluctuations resulting from disturbances in the IS curve, but reduce those resulting from disturbances in the LM curve [Cagan (1979)]. I am not sure that this argument is important, and I am not even sure that it is correct. It is true that a reduction in the transaction costs on bonds reduces the demand for money at any given level of the bond yield.

As pointed out in Mayer (1982), it does not necessarily follow that the interest-elasticity increases. Consider the familiar inventory models for the demand for cash. Both with proportionate and with fixed transaction costs the interest-elasticity is independent of transaction costs, in the first case at the level of $-1/2$, in the second case at -2. This is intuitively plausible also on more general considerations, because transaction costs typically introduce friction in the sense of slowing the adjustment to interest changes; it is not clear why they should influence the relative size of the eventual adjustment in a particular way.

6.2. *The demise of intermediate targets*

At another level, financial innovation blurs the distinction between money and other financial assets. For the intermediate-target approach to monetary policy, this distinction plays an important role. While originally adopted probably because of the particular decision-making procedures in the Federal Reserve System, Milton Friedman's advocacy of M_1 as intermediate target made this approach the hallmark of strict monetarism.

In the course of the last five years, financial innovations made it increasingly difficult to maintain M_1 as an intermediate target. With the continuous shifts in the financial structure and in the characteristics of financial assets, any given specification of M_1 was constantly changing its economic meaning. The demand for whatever was defined as money seemed to shift. To compensate for these shifts, policy makers were forced to make frequent adjustments in their statistical series. I think this is a game central banks should not play. Monetary aggregates are valuable sources of information provided they are left unchanged for a long time, certainly for decades. Constant changes to suit the perceived needs of policy makers reduce the information value of the series and undermine confidence in monetary policy itself.

Today, therefore, central banks seem to move away from elevating one particular monetary aggregate to the exalted rank of an intermediate target. M_1 is in the process of being relegated to the same role as other aggregates, namely the role of a source of potentially useful information about the economy. Of course, this shift in procedures does not, in itself, involve a shift in the substance of monetary policy. In particular, policy can still be as monetarist or non-monetarist as the central bank deems appropriate. The shift in procedures just means that both the performance and the intentions of the central bank will increasingly be expressed in terms of the aggregate it really controls, namely, the monetary base.

6.3. *The obsolescence of bank multipliers*

At a third level, financial innovations, including multinational banking,

seem to have threatening portents for the effectiveness of bank reserve requirements [see Cagan (1979)]. If reserve requirements are different for different types of deposits, innovation-induced shifts of funds produce fluctuations in the money supply. If funds move from deposits and institutions with high required reserves to deposits and institutions with low, or even zero, required reserves, the average reserve requirement is lowered and thereby made less effective as a stabilizer.

Arguments of this kind consider the consequences of financial innovation in the context of the traditional money multiplier theory. I believe their validity is doubtful because financial innovation undermines the relevance of the traditional multiplier theory itself. The gradual decline in transaction costs, the development of Euromarkets and multinational banking, the relative contraction of the regulated segments of the financial system and the gradual relaxation of regulation, make credit markets progressively more perfect. As a consequence, the multiplier model, constructed for highly imperfect markets [Tobin (1963)], becomes less and less applicable. A good paradigm for a credit system without multipliers is the Eurodollar market. It is essentially a nearly-perfect distribution network for time deposits in which banks can expect to borrow or lend funds of any maturity in almost any desired amounts at rates close to market rates. As a consequence, the relevant risks concern not deposit in- and outflows, but future interest rates; liquidity reserves are not important.

Of course, reality does not quite conform to this paradigm either, but still retains features of the traditional model. In fact, just as the national money markets began to assume features of the Euromarket, so the latter developed features of the former national markets. I would nevertheless conjecture that the traditional multiplier model is no longer a useful guide for monetary policy. The erosion of reserve requirements may be less of a threat than is often suggested, and bank reserves may no longer be a useful thing to control.

What the central bank still can, and should, control is the monetary base, defined as the sum of currency and bank reserves. In this important respect, financial innovation and multinational banking have brought no significant change. It is conceivable that the central bank, just as it supplies the public with currency, will begin to supply it with deposits in a central electronic transfer system. It is also conceivable that the attractiveness of such deposits may be increased by the payment of interest and by giving them the status of legal tender. However, this would leave the working of a base policy essentially unaffected.

If this were a conference on science fiction, it would perhaps be interesting to speculate about monetary policy in a world in which the decline in transaction costs has finally obliterated the distinction between money and non-monetary assets. But this is quite far from the world we live in and is, at the present time, better left to the pure theorists.

References

Branson, W.H., 1968, Financial capital flows in the U.S. balance of payments (North-Holland, Amsterdam).
Branson, W.H., 1970, Monetary policy and the new view of international capital movements, Brookings Papers on Economic Activity 2, 235–270.
Cagan, P., 1979, Financial developments and the erosion of monetary controls, in: W. Fellner, ed., Contemporary economic problems (American Enterprise Institute for Public Policy Research, Washington, DC) 117–151.
Dornbusch, R., 1982, Flexible exchange rates and interdependence, Working paper no. 1035 (National Bureau of Economic Research, Cambridge, MA).
Dufey, G. and I.H. Giddy, 1981, Innovation in the international financial markets, Journal of International Business Studies 12, no. 2, 33–51.
Friedman, M., 1970, Controls on interest rates paid by banks, Journal of Money, Credit, and Banking 2, no. 1, 15–32.
Giddy, I.H. and D.L. Allen, 1979, International competition in bank regulation, Banca Nazionale del Lavoro Quarterly Review 32, no. 130, 311–326.
Gray, J.M. and H.P. Gray, 1981, The multinational bank: A financial MNC?, Journal of Banking and Finance 5, no. 1, 33–63.
Grubel, H.G., 1977, A theory of multinational banking, Banca Nazionale del Lavoro Quarterly Review 30, no. 123, 349–364.
Guttentag, J. and R. Herring, 1980, Financial disorder and eurocurrency markets, in: Bank structure and competition (Federal Reserve Bank of Chicago, Chicago, IL) 43–59.
Hopton, D., 1983, Payment systems — A case for consensus (Banking for International Settlements, Basel).
Keynes, J.M., 1923, A tract on monetary reform (Macmillan, London).
Kindleberger, C.P., 1974, The formation of financial centers: A study in comparative economic history, Princeton Studies in International Finance, no. 36.
Liviatan, N., 1983, Anti-inflationary monetary policy and the capital import tax, Unpublished manuscript (Hebrew University, Jerusalem).
Mayer, T., 1982, Financial innovation — the conflict between micro and macro optimality, American Economic Review Papers and Proceedings 72, no. 2, 29–34.
Meade, J.E., 1951, The balance of payments (Oxford University Press, London).
Modigliani, F., 1973, International capital movements, fixed parities, and monetary and fiscal policies, in: J. Bhagwati and R.S. Eckaus, eds., Development and planning (Essays in honor of Paul Rosenstein Rodan) (MIT Press, Cambridge, MA) 239–253.
Niehans, J., 1977, Benefits of multinational firms for a small parent economy: The case of Switzerland, in: T. Agmon and C.P. Kindleberger, eds., Multinationals from small countries (MIT Press, Cambridge, MA) 1–39.
Spraos, J., 1953, The theory of forward exchange and recent practice, Manchester School 21, 87–117.
Tobin, J., 1963, Commercial banks as creators of 'money', in: D. Carson, ed., Banking and monetary studies (Richard D. Irwin, Homewood, IL) 408–419.
Tobin, J., 1969, A general equilibrium approach to monetary theory, Journal of Money, Credit, and Banking 1, no. 1, 15–29.
Tobin, J., 1970, Deposit interest ceilings as a monetary control, Journal of Money, Credit, and Banking 2, no. 1, 4–14.
Tobin, J., 1978, A proposal for international monetary reform, Unpuplished manuscript, Cowles Commission, Yale University.
Tsiang, S.C., 1959, The theory of forward exchange and effects of government intervention on the forward exchange market, International Monetary Fund Staff Papers 7, 75–106.
Walker, D.A., 1978, Economies of scale in electronic funds transfer systems, Journal of Banking and Finance 2, no. 1, 65–78.