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THE EURO-DOLLAR MARKET:
SOME UNRESOLVED ISSUES

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INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

PRINCETON UNIVERSITY

Princeton, New Jersey

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THE EURO-DOLLAR MARKET: SOME UNRESOLVED ISSUES

In recent years, a few books as well as a fairly large number of articles and essays have dealt with the international markets for foreign-currency deposits, notably the Euro-dollar market. The subject has proved to have considerable fascination for students of international finance. This is not surprising, since the market's ramifications encompass virtually every facet of international financial relations. On its origins, functioning, and characteristics, little can be added to what has been said before. But, to judge from recurrent questions raised by economists in informal discussions, not all the analytical issues associated with the market have received the attention they deserve. It is the purpose of this paper to examine some of these issues in the hope of stimulating further discussions of the market's problem areas. The answers are sought against the background of the institutional realities of the market.

One issue that has aroused a fair amount of interest among economic analysts concerned with international finance is how the utilization of Euro-dollars affects the volume of dollar credit and dollar deposits outside the United States. Do foreign banks that employ Euro-dollar balances for loan and investment operations have the capacity to increase their dollar deposit liabilities to the public, and simultaneously their dollar loans, by some multiple of the increase in U.S. dollar deposits originally placed with them? Is there, as a result of Euro-dollar transactions, a monetary expansion process abroad analogous to the creation of dollar credit and deposits by banks in the United States as they acquire excess reserves?

Another problem has to do with a rather recent phenomenon, which is just beginning to excite the curiosity of students of the money market: the surge, during the last year or two, in the use of the market by major American banks for the purpose of expanding their credit base. The question is the significance of these sharply increased takings of Euro-dollars and their implications for domestic and international monetary policy.

Consideration of this issue raises the question of the market's relation to our balance of payments. On the one hand, has the market produced significant changes in any of our major payment accounts? And on the other hand, have the deficits in our international transactions been a necessary condition for the growth of the market, with the consequence

that the market is likely to shrink if our balance of payments moves into surplus?

Finally, an issue calling for comment is the response of central banks to market operations that have effects counter to their policy objectives. In this connection, we shall discuss briefly the whys and hows of the instruments that central banks have employed to maintain a measure of control over investor and user access to the market.

SUPPLY-AND-DEMAND STRUCTURE OF THE MARKET

A few words on the supply-and-demand structure of the Euro-dollar market may be a useful prelude to the discussions that follow. This market—which approaches \$15 billion in net size—is made up of foreign banking institutions that accept and invest balances on deposit in American banks. Institutions that are heavily engaged in Euro-dollar transactions and are therefore referred to as Euro-banks are located for the most part in Western Europe and Canada, but the term is applicable also to certain banks in other parts of the world, notably in Lebanon and Nassau.

As to the sources of the dollar balances that enter the market, there are first of all those placed by corporations and individuals, both resident and nonresident. These balances, in turn, derive from existing deposits held in the United States, from conversions of local and other foreign-currency holdings into dollars, or from dollar proceeds from sales of goods, services, and capital assets. Virtually all Euro-dollar balances represent deposits placed with a view to earning a return, but some—notably in Switzerland and Canada—are held in current accounts maintained by corporations for transactions purposes.

These dollar balances from nonbank sources reach the market, of course, through the commercial banks in which they have been deposited. But commercial banks themselves are also a source of supply, as they use the market on a large scale for the placement of excess cash reserves, converted into dollars for that purpose.

Central banks and other official institutions are another important source of Euro-dollars. A large number of central banks in developing countries and a few in Europe have for several years been depositing dollar balances in foreign banks. Some have done so only when their own commercial banks were withdrawing dollars from the market, notably during periods of seasonal or window-dressing pressures. A few, for a variety of reasons, have even offered substantial amounts of dollars, at attractive rates, to the commercial banks of their own countries under repurchase agreements; for the most part the commercial banks have employed such balances in the Euro-dollar market.

Finally, the Bank for International Settlements has continuously been

a major supplier of funds to the Euro-dollar market, employing dollars from various sources. Substantial amounts represent funds deposited with it by some central banks. At times, in order to stabilize the market, the BIS has employed dollars obtained under swaps with the Federal Reserve System; thus, for brief periods, the available supply in the Euro-dollar market has been augmented by Federal Reserve credit.

Turning now to the major uses of the dollar deposits accepted by foreign banks, the balances may be put to immediate end-use by the accepting bank, but often they are passed on for redeposit in other banks—a process that may be repeated several times, perhaps even within the span of a few hours. When the funds are finally employed, a major portion goes into loans to nonbanks for financing commercial transactions. Among these, loans for foreign-trade financing are the most important, partly because of governmental restrictions on other uses. If the borrower does not need dollars for payment purposes, he has his bank sell the loaned dollars for another currency; or the loan itself may be denominated in a third currency that the bank has bought with Euro-dollars in order to meet the needs of its customers for low-cost loans. In fact, a substantial portion of the dollars deposited in foreign banks is sold for third currencies, either by the recipient banks or by the ultimate borrowers. Such sales are invariably made when dollar balances are employed by Euro-banks in money markets outside the United States.

At present another major use of Euro-dollar balances is their placement in head offices by overseas branches of American banks, for the express purpose of improving the parent bank's liquidity position and credit base. Also, sizable amounts of Euro-dollars are employed in loans to American companies for financing the needs of overseas affiliates. And further amounts are utilized by the New York agencies and branches of foreign banks for commercial loans and loans to securities dealers and brokers. Thus, in appraising the effects of the Euro-dollar market, adequate allowance must be made for the fact that a substantial portion of dollar deposits placed with Euro-banks is actually employed for deposit and credit operations in the United States, rather than for loan and investment transactions abroad.

THE PROCESS OF MULTIPLE EXPANSION

The question whether Euro-banks as a group can engage in a multiple expansion of dollar credit and deposits abroad has important implications for international financial mechanism.¹ No attempt is made here to handle this problem by means of a formal multiplier model. The pur-

¹ The question has received some attention in the literature. See, for instance, Leland Yeager, *International Monetary Relations: Theory, History and Policy* (New York 1966) p. 468; also Geoffrey L. Bell, "Credit Creation Through Euro-Dollars?" in *The Banker* (August 1964).

pose of the following observations is rather to point up some of those institutional characteristics of the market that have a bearing on what might be called the Euro-bank multiplier.

Pyramiding of Interbank Dollar Deposits

Needless to say, the problem has no direct relevance to interbank redeposits of dollars—that is, balances that are redeposited by one Euro-bank in another rather than employed for loans to nonbanks. But since such redeposits are an important feature of the Euro-dollar system it may be in the interest of analytical clarity to discuss them briefly.

Euro-banks redeposit dollar balances in other Euro-banks primarily in order to take advantage of interest-arbitrage opportunities. Such deposits also permit more intensive use of surplus funds and assist both suppliers and takers of dollar balances in making short-term adjustments in their liquidity positions. But dollar deposits by Euro-banks also serve the specific purpose of providing correspondent banks in and outside the Euro-dollar area with funds for financing commercial transactions.

Virtually every interbank Euro-dollar deposit involves a transfer in the books of a bank in the United States whereby the funds are credited to the account of the bank accepting the balance. The Euro-dollar market may thus give rise to a pyramiding of interbank deposits abroad on the basis of a given dollar deposit in an American bank. But the economic significance of these successive redeposits is confined to the fact that they make for a rapid and efficient transmission of short-dated funds to banks that are in a position to employ dollar balances for end-use purposes. The redeposits tend to improve the allocational efficiency of international banking, but successive interbank time-deposit liabilities do not add to the means of payment available for commercial transactions. Economic activity is not increased except to the extent that ready access to additional resources adds to the ability of banks to supply credit to borrowers in need of funds.

The banks that participate in deposit trading need to hold only minimal transaction balances in American banks as long as they see to it that the deposits they accept and place carry the same maturities. Some of the banks that are heavily engaged in deposit trading also carry commensurate balances with their American bank correspondents, but the size of these balances is typically quite modest and is not tied to their outstanding dollar liabilities. In view of the very narrow interest-rate margin earned in each successive deposit transaction, any sizable retention of balances in American deposit accounts would render the redeposits unprofitable.

In the absence of any required or desired relationship between balances in American banks and interbank dollar-deposit liabilities of foreign

banks, the expansion potential of such deposits is virtually infinite: on the basis of a single dollar deposit, Euro-banks could generate a very large multiple of deposit liabilities and claims. In actual practice, however, the successive redeposit of balances cannot go on indefinitely. At each stage of redeposit, an accepting bank may find it more profitable to put the balance to an end-use than to redeposit it, especially because dollar balances tend to flow to countries with relatively high loan rates. Moreover, some banks make it a practice to accept balances only if they need funds for end-use purposes. The leakage of deposits into end-uses becomes increasingly likely if, as may well occur, the interest-rate margin earned by the deposit-placing bank includes a risk premium, arising either from the smaller size of the accepting bank's aggregate resources or from the vulnerability of its local currency. This risk may grow at each successive stage of redeposit and finally absorb the margin altogether. At that point, the pyramiding of interbank deposits comes to an end.

Even when Euro-dollar balances are put to end-uses, this by no means signals the beginning of a process of dollar-deposit creation abroad. Foreign banks often obtain or accept dollar balances because they wish to buy third currencies needed for loan and investment operations; such dollars do not even begin to circulate in foreign dollar-loan markets. Moreover, very large amounts of Euro-dollar deposits—possibly as much as \$5.5 billion—are employed by foreign banks, and especially by the overseas branches of American banks, for deposit and loan transactions in the United States. Only a part of dollar deposits in Euro-banks is employed in dollar loans to foreign nonbanks—the use that could initiate a process of multiple credit creation in Euro-dollars. The outstanding amounts of such loans extended by Euro-banks themselves may be roughly estimated at \$5 billion. In addition, banks outside the Euro-dollar area probably utilize for dollar loans to residents in their own countries approximately \$2 billion of the estimated \$4 billion that they obtain from Euro-banks.

Deposit Creation through Dollar Loans to Nonbanks

Euro-banks, as a rule, extend dollar loans either by crediting the entire amount of the loan to the borrower's account in their books or by authorizing him to make overdrafts on his account. The borrower then instructs the bank either to use the dollars for the purchase of specified currencies or to transfer given amounts of the loan to dollar accounts in given banks, and the lending bank makes these payments out of balances it holds in the United States. The process is essentially the same if the lending bank provides its customers with dollar checking facilities, as a few banks do in continental Europe; the banks in which the checks are

eventually deposited are paid by the lending bank through credit transfers to their accounts in the United States. Not infrequently, the lending bank follows the procedure that is customary in the foreign interbank dollar-deposit market: rather than have the borrower draw on his account abroad, the bank transfers the loaned amount to an account in an American bank designated by the borrower, who can then dispose of the funds according to his needs.

The Euro-dollar expansion process is in theory similar to the one that is familiar in the creation of credit in the United States on the basis of a given amount of excess reserves. Assume that a Euro-bank acquires or accepts balances in American banks not hitherto circulating in the Euro-market, and then substitutes dollar loans to nonbank borrowers abroad for its new bank balances in the United States. As the borrowers disburse the amounts borrowed, some of the recipients redeposit the dollars in Euro-banks, which use them in granting additional loans to foreigners. The cycle continues if these borrowers make payments that result in additional dollar deposits in Euro-banks. Each borrower's disbursement leads to an equivalent diminution of the lending bank's cash reserves in American banks.

In theory, this process would give rise to a series of dollar loans and deposits abroad based on one dollar deposit in the United States. Moreover, it could have a much larger multiplier than the analogous process in the United States, where the multiplier is limited by legal reserve requirements. Foreign banks that accept dollar deposits from nonbanks are not required to immobilize part of their dollar assets in nonearning balances with their central bank (though a few countries require that domestic-currency deposits be held in the central bank against net dollar liabilities to foreigners). Nor do they need more than minimal contingency reserves in American banks to meet unexpected withdrawals. For those of their dollar liabilities that are payable at stated maturity dates or after advance notice, rather than on demand, the need for contingency reserves held in the United States is virtually nil. For deposits payable at call and current-account deposits, the function of such reserves can be served by various alternatives. One is the Euro-bank's cash reserves in local currency, if convertible into dollars (though their actual use could entail unanticipated interest and forward-rate costs). Another is standby credit lines in American banks. And a commonly used alternative is call deposits of dollars in other Euro-banks, as such deposits can be made available in the United States within a day or two, if need be.

It may be noted, incidentally, that banks that accept call deposits—particularly some of the overseas branches of American banks and the Canadian and other foreign banks that have agencies and branches in the United States—are typically in a position to employ such balances profit-

ably in this country, either by using them as a substitute for purchasing liquidity in the United States or by placing them here as call loans to securities dealers and brokers. As a result, the function of protecting Euro-banks against cash drains and maintaining their ultimate cash reserves is to a considerable extent performed by those banks abroad that operate in both the Euro-dollar market and money markets in the United States, and, thus, are in a position to act as arbitrageurs between the two.

But, despite the fact that dollar loans extended by Euro-banks can theoretically lead to a very substantial multiple expansion, the expansion that actually occurs is quite limited. The reason is that leakages of dollars from the system are very large. In the United States, dollar deposits as they are disbursed remain in the banking system until they are extinguished through a contraction of bank credit or withdrawals of currency or specie; and, as long as they remain in the system, a loss of deposits by an individual bank is offset by a corresponding gain by another bank. In the Euro-dollar system, this does not hold true. The dollar liabilities of Euro-banks, consisting almost entirely of call and time deposits, serve only to a limited extent as a medium of payment, and one Euro-bank's loss of dollars is not likely to be offset by another's gain.

To be sure, the dollar is universally acceptable for international payments and a substantial portion of world trade is settled through payments over bank accounts in the United States. Nevertheless, the dollar is not a fully effective circulating medium of payments abroad: foreign firms and individuals cannot always employ their dollar receipts to meet their own payment needs without conversion into other currencies. In Western Europe, the core of the Euro-bank area, interregional transactions are typically billed and settled in local currencies. Frequently, commercial firms in need of financing, notably importers, find it convenient and less expensive, in the light of prevailing interest-rate constellations, to borrow dollars rather than the currency immediately required, but, more often than not, they direct the lender immediately to sell the loan proceeds for their account in order to acquire the currency needed for their payments. And, when loan proceeds are indeed used to make dollar payments to suppliers in various areas of the world, the recipient may well be a United States resident who deposits the dollars in his account with a bank in the United States rather than in a Euro-bank. If he is a foreigner, he is likely to need his own or third currencies for making disbursements and, therefore, to sell his dollar receipts; there is no reason for assuming that more than a small part of such dollar accruals to foreign accounts will be redeposited with a Euro-bank.

These general observations may be qualified to some extent. A number of multinational companies, including affiliates of American corporations,

maintain dollar accounts in Euro-banks, over which they receive payments from the United States and other parts of the world, primarily the dollar area, and from which they make disbursements, sometimes by check; many financial institutions and business firms that have continuous inflows and outflows of dollar payments maintain such accounts rather than incurring the costs of selling dollars at bid and repurchasing them at asked prices. At least some of the payments to such accounts probably originate in dollar loans from Euro-banks: thus the proceeds of a Canadian bank's loan in U.S. dollars may be paid by the borrower into his supplier's dollar account in a European bank, and that bank may then relend the dollars. In still another return-flow type of transaction, a company in the United States that receives a medium-term loan from a Euro-bank may keep the borrowed amount on deposit with the lender, pending disbursement for investment projects abroad. It is also quite possible that some of the dollars deposited with Euro-banks by central banks derived originally from Euro-dollar loans. And some recipients of these funds, notably in the oil-producing areas of the Persian Gulf, make it a practice to hold a proportion of their continuously growing wealth in the form of Euro-dollar deposits (residents of the Middle East held at the end of 1966 approximately \$1 billion in dollar deposits with European banks). There may well be a relationship, however tenuous, between the loan extensions of Euro-banks and their recapture of balances from such sources.

But these are modifications, not contradictions, of the general rule that Euro-banks in the aggregate cannot anticipate any sizable recapture of dollar deposits they have used for loan extensions. Nor can a particular Euro-bank expect—as can very large banks in the United States—that some of the disbursements by firms to which it extends credit will be paid into accounts of its own customers. The weight of the evidence indicates that the process of multiple expansion terminates at a very early phase of the circuit and, hence, that any increase in Euro-bank loans results in a relatively modest rise in dollar deposits in Euro-banks. Moreover, part of the deposit increase that does occur—how large a part depends on international interest-rate constellations—may be employed in the United States. And a further part—its size dependent not only on interest-rate but also on forward-rate constellations—may be swapped into third currencies. On the whole, therefore, it appears that the Euro-bank multiplier is very low, lying probably in the approximate range of 0.50 and 0.90.

The obvious ability of these banks to expand their dollar liabilities at a rapid rate—by as much as \$3.5 billion in 1966 alone—rests primarily on their ability to offer holders of liquid balances throughout the world investment facilities superior to those available in other markets. They

enjoy several competitive advantages over banks in the United States: they are able to pay interest on deposits with a maturity of less than 30 days; in their borrowing and lending transactions they are willing to operate within very narrow interest ranges; they are not subject to regulatory restrictions on time-deposit rates; and they benefit from the ease and convenience with which Euro-dollar deposits can be made. Other major elements in their competitive strength are their proximity to important depositors of dollars, their continuous contact with major market participants through their foreign-exchange dealings, and old-established account relationships with potential depositors. And a further factor contributing to growth is the market participation of those central banks that either directly place dollar balances with Euro-banks or sell them dollars at advantageous swap rates for reasons of domestic or international monetary policy.

In brief, in their dollar-loan operations Euro-banks pass on funds created almost entirely in the United States rather than by their own loans. They are well able to replenish their supply of dollars and thus to return to use in the Euro-dollar system the dollars that disappear from the system as a result of their loans and investments.

USE OF EURO-DOLLARS BY MONEY-MARKET BANKS IN THE UNITED STATES

Euro-dollar deposits have been used in money and loan markets in the United States to some extent since the Euro-dollar market first developed. In 1966, however, American banks through their branches in London and other major international financial centers sharply increased their use of the market in order to improve their ability to meet their loan commitments. By early December of that year, their takings (including balances of a rather different nature obtained from their Tokyo branches) had risen by \$2.3 billion to substantially more than \$4 billion. Toward the year-end and during the early months of 1967, the use of Euro-dollars by these banks fell off, but by November 1967 it had exceeded even its earlier peaks, reaching a total of more than \$4.5 billion. The surge in overseas branches' placements of Euro-dollar balances in their head offices is one of the most significant developments in the history of the market. As a result, a relatively small number of banks in the United States have become the most important factor on the demand side for Euro-dollars. The conditions that determine their demand for funds now have immediate reverberations abroad.

The use of the Euro-dollar market by banks in the United States has been facilitated by the fact that deposits accepted by the branches are not subject to any of the interest-rate limitations that apply to deposits at the head offices under Federal Reserve regulations. Nor do the interest-rate ceilings apply to whatever payments banks make under internal account-

ing arrangements in order to compensate their branches for funds obtained for their account. Branches, unlike the parent banks at home, can therefore pay interest on call, overnight, and other balances with a maturity of less than 30 days and, when these are deposited in head offices, the parent banks can obtain very short-dated deposits. Another attraction is that balances obtained from branches are not subject to legal reserve requirements or to the fees charged by the Federal Deposit Insurance Corporation.

The large-scale use of the Euro-dollar market by American banks in 1966 was an effort to find relief from pressures that were increasingly jeopardizing their liquidity position. In the summer of that year, when business loan demand was extraordinarily intensive, the Federal Reserve, in order to slow down the expansion of business loans, provided reserves only reluctantly. At the same time, rates on money-market paper rose well above the $5\frac{1}{2}$ per cent ceiling provided by Regulation Q for time deposits. Yet the Federal Reserve refused to lift the Q ceiling and thereby exerted strong pressure on those banks that relied for additional resources on the national market for certificates of deposit. As expected, corporate treasurers and other institutional investors shifted into competing open-market paper a large part of the funds obtained from C/D run-offs. As a result the large money-market banks with branches abroad found it increasingly difficult to attract new funds, and actually lost almost \$3 billion of C/D money that was sorely needed to meet the rapidly growing loan demand of important corporate customers.

Aggressive bidding for Euro-dollars through overseas branches thus constituted one of the major responses of large American banks to the credit crunch of 1966. By offsetting their time-deposit losses through purchases of liquidity abroad, the banks with overseas branches attempted to escape or cushion Federal Reserve pressures on their reserve positions and to live up to their loan commitments. Euro-dollar takings from their branches reduced the need to liquidate municipals at bargain basement prices and to make other costly portfolio changes in order to accommodate borrowers.

The surge in the use of Euro-dollars in the summer and fall of 1967 occurred in a money-market environment quite different from that prevailing in 1966. Though some concern over the possibility of a resumption of strong reserve pressures was evident, liquidity positions in 1967 were much more comfortable than a year earlier. The heavy takings in the more recent period must be viewed as indicating a greater readiness to make use of the market on the part of those banks that in 1966 had discovered its potential as a source of funds and had become reassured about its breadth and depth. Others probably decided to maintain their position in the market even in the absence of pressing needs for funds so

as to be able to step up takings if and when necessary. Moreover, in the summer and fall of 1967 balances offered to the branches were greatly augmented as foreign investors, because of waning confidence in sterling, shifted substantial amounts of funds from the London money market to the Euro-dollar market. (Conversely, the decline in branch deposits in head offices early in 1967 was the result—at least in part—of the massive reflux of short-term funds to the London money market.) In this context it should be noted that some branches, during periods of sharply increasing supplies, will take on balances in excess of immediate needs and place them in head-office accounts. The motive is to accommodate important suppliers or to maintain market relationships that have been established with considerable effort. Therefore, supply increases that cannot be easily absorbed by other market sectors will come to rest in the head offices.

The increase in 1966 of more than \$2 billion in the domestic use of Euro-dollars by American banks with branches abroad and the subsequent fluctuations in their takings have important domestic and international implications. Domestically, the question is the effect on required reserves and on the distribution of deposits and reserves among banks in the United States. Placements of Euro-dollars by overseas branches in their head offices and the corresponding gains of reserves by the banks involved do not mean, of course, that the total reserves of member banks are increased. However, as dollar deposits in American banks take the form of branch balances in head offices, deposits subject to reserve requirements are reduced and reserves are therefore released. Unless absorbed by the Federal Reserve, these reserves can be used for the acquisition of earning assets by the banking system. Thus a given degree of reserve availability can support a larger amount of investments in earning assets by the banking system as a whole.

As to changes in the distribution of deposits and reserves among banks in the United States, it is of course virtually impossible to trace the ultimate sources of the funds obtained by the large money-market banks as a result of branch takings for head-office account. It seems probable, however, that the gains of deposits and reserves by banks with branches abroad are at the expense of other banks in the United States. A large part of the underlying funds derive from dollar balances that continuously accrue to foreign-exchange markets in consequence of our balance-of-payments deficit, and are transferred to foreign accounts by banks throughout the United States. However, the demand for Euro-dollars by American banks may be so large that Euro-banks that wish to meet it at a price will step up their dollar purchases to a point where central banks must supply additional dollar balances to foreign-exchange markets. The central banks in turn will then be forced to liquidate money-

market investments in the United States, mainly Treasury bills, in order to generate the requisite funds. (This occurred in 1966. The Euro-dollar borrowings by American banks during that year were so large that they not only absorbed the net accrual of dollar balances to foreign accounts resulting from our balance-of-payments deficit, but also contributed to the substantial decline in the holdings of dollar assets of several central banks—and, incidentally, to the surplus in our balance of payments as computed on the basis of official reserve transactions.) The ultimate sources of the requisite funds are the buyers, whoever they may be, of the securities sold by the central banks.

The reaching out for Euro-dollars on the part of American banks has thus important repercussions on international flows of funds, as well as on flows within the United States. To the extent that the international flows of funds are equilibrating—that is, involve movements from countries with balance-of-payments surpluses to the money market of a deficit country such as the United States—there is much to be said for them. But the consequences can be harmful to international balance when the flows involve disequilibrating movements from money markets of countries with deficits in their international accounts. This became evident in 1966, when the high rates paid by the branches for Euro-dollars contributed to an outflow of funds from the United Kingdom. As the incentive for covered-interest arbitrage began to shift from sterling to Euro-dollar investments, foreigners reduced their stake in the London money market and acquired dollars from the British monetary authorities. Banks in London that had borrowed Euro-dollars in order to swap them for sterling did not renew their swaps as their investments in sterling money-market instruments matured. And these and other banks in the United Kingdom, within the narrow limits set by the authorities, swapped sterling into dollars for placement in the market.

These developments demonstrate that the ebb and flow of Euro-dollar takings by large American banks in response to ease and tightness in our money market not only affects the reserve position of major countries abroad, but also materially changes conditions in foreign money markets. Money-market conditions in the United States are now even more quickly transmitted to the Euro-dollar market than in the past, and through it to other segments of the Euro-currency market, as well as to national money markets. Conversely, major upheavals in foreign money markets, such as heavy flows into and withdrawals from London in response to the changing fortunes of sterling, substantially affect the aggregate amounts of funds offered in the Euro-dollar market. The interlinkage between the money market in the United States, the Euro-dollar market, and major foreign markets has become even closer than it was formerly.

THE EURO-DOLLAR MARKET AND THE BALANCE OF PAYMENTS
OF THE UNITED STATES

The Euro-dollar market is now the major repository for dollar balances held by foreign banks. The ultimate cause of the accumulation of dollar balances abroad is, of course, our persistent balance-of-payments deficit. The questions to which we now turn are whether the Euro-dollar market has contributed to the imbalance in our international accounts and, conversely, whether our deficits have been a major factor in the emergence and growth of the market.

*Effects of the Market on the Balance of Payments
of the United States*

The vast amounts of dollar-denominated short-term capital set into motion by the Euro-dollar market have left their mark on the capital accounts in the payments balance of the United States. How our balance has been affected by the market operations of one important group of transactors, American banks with branches abroad, was mentioned briefly in the preceding section. The Euro-dollar market has a number of other repercussions on the balance of payments—some of them highly complex and in need of examination.

Our balance-of-payments position, whether measured on the liquidity basis or on the basis of official-reserve transactions, is affected by the changes the market induces in outflows of private American capital. (The balance on the "liquidity" basis is measured by changes in monetary reserves and in liquid liabilities to all foreigners. The balance on the "official-reserve-transactions" basis is measured by changes in monetary reserves and in selected liabilities to foreign monetary authorities. In the unlikely event that the entire outflow of private American capital were retained by private foreigners, the official-reserve-transactions balance would not, of course, be affected.) In addition, the market may influence the official-transactions balance by giving rise to shifts between monetary authorities and private holders with regard to dollar balances held in American banks. The following discussion examines first the effects on capital outflows.

Capital Outflows from the United States. There is no doubt that the Euro-dollar market has significantly stimulated outflows of funds of U.S. residents, primarily because it has offered rate advantages. This stimulative effect has diminished considerably in recent years, but the reason has been the balance-of-payments program of the United States Government. American corporations have been induced to place some of their surplus funds abroad because large foreign banks have offered them more attractive depository facilities for dollar-denominated time

balances than those available from banks at home; and the inducement has been the greater because the foreign banks include some, notably the Canadian chartered banks, with which major American corporations have had well-established account relationships. (At the end of 1964 corporations in the United States held \$1.5 billion of U.S. dollar deposits in the Canadian chartered banks. By the end of 1967, as a result of the balance-of-payments program, such balances had dropped to \$600 million.) Most corporations that have placed funds in Canadian and other Euro-banks have never invested in other foreign money-market assets, and probably would not have done so if the Euro-dollar market had not existed. As compared with such investments, dollar time deposits in Euro-banks have the advantage of not entailing costs for covering the exchange risk, and hence of enabling the American investor to increase his return by the full differential between foreign and domestic rates for comparable short-term dollar investments. So long as that differential is favorable, and is not offset by nonmarket pressures, the Euro-dollar market exerts an adverse influence on our balance of payments.

On the other hand, the existence of the market has served also to reduce capital outflows from this country. Banks abroad, including the overseas branches of American banks, have been able to obtain sizable resources in the market at a moment's notice, thereby materially reducing their own and their customers' demand for bank credit in the United States, a debit item in our balance of payments. In addition, outflows for direct investment abroad have been reduced because of the ability of our corporations to arrange for Euro-bank loans to finance the short- and medium-term needs of their affiliates, instead of meeting these needs out of their own resources. Thus, some of the burden imposed on our balance of payments by United States-based financing of international trade and of large investment projects abroad has been shifted to Euro-banks.

This development has been particularly pronounced since the institution of the President's balance-of-payments program in 1965. To an important extent, the success of that program has been due to the ability of our banks to deflect the demand for dollar loans to their branches and to other banks abroad, which could obtain at least part of the required funds in the Euro-dollar market; American banks have also sold parts of their foreign-loan portfolios to their overseas branches, with payments made in Euro-dollars. Similarly, American corporations, even more than before, have had their affiliates meet working-capital needs through loans from Euro-banks, often at rates lower than they would have to pay in the United States.

Thus the Euro-dollar market may both stimulate and retard outflows of U.S. funds. Since 1965, as a result of the balance-of-payments pro-

gram, the stimulative influence of the market on our capital outflows has diminished substantially and its retarding influence has increased. But one could argue that this result could have been achieved also if the Euro-dollar market had not existed—that even in the absence of the loan facilities of Euro-banks, the program would have restricted foreign lending by American banks and persuaded American corporations not to increase the use of their own resources for direct-investment outlays overseas.

Capital Inflows into the United States. We now turn to the effects of the market on the distribution between official and private dollar balances. The facts of experience demonstrate that the market has given rise to a sizable increase of private balances. Euro-dollars have provided a bridge between the American and foreign money and loan markets, over which large amounts of funds have passed that otherwise would have remained in, or fallen into, the hands of foreign official institutions. As noted earlier, large American banks have been able to obtain from their overseas branches considerable amounts of dollar balances that in the absence of the market would have been acquired or retained by foreign central banks. The market has led foreign commercial banks to demand dollars for use in various sectors of the money and loan markets in the United States—for call loans to securities dealers and brokers (outstanding loans of agencies and branches of foreign banks in New York to securities dealers and brokers have ranged between \$700 million and \$1 billion in recent years), for placements in the Federal-funds market, notably over the weekend, and since 1966 for sizable amounts of loans to corporations (short- and long-term loans of foreign banks to corporations in the United States may be roughly estimated at \$500 million at the end of 1967). And banks abroad have been enabled by the market to obtain funds for financial operations in the United States without committing their domestic-currency resources. This has been especially true of some of the foreign banks that have branches or agencies in New York; without the market's facilities these banks would probably have drawn to a greater extent on their banking correspondents in the United States, or possibly have expanded their operations in this country to a lesser extent.

Another way in which the Euro-dollar market has induced the retention in private hands of dollars that otherwise would have been sold to monetary authorities is by increasing somewhat the working and commensurate balances that foreign banks maintain in the United States. In several of our major banks, very large inflows and outflows associated with Euro-dollar (and foreign-exchange) transactions occur each day in foreign accounts, and at least some foreign banks have added to their funds in American banks to maintain adequate working balances and

on occasion to compensate their correspondents here for the cost of clearing the huge turnover. Typically, however, the opening and closing balances of these accounts remain negligible relative to the activity. Analysis of foreign-deposit balances in our banks indicates that banks abroad have not increased their commensurate funds in line with the growth of their transactions over their accounts in this country. Therefore the improvements in our official-transactions balance on this account have not been very significant.

Finally, private holdings in this country are increased by the contingency reserves that Euro-banks carry in the United States to protect themselves against sudden withdrawals of dollars. As noted previously, the need for such reserves has been modest. The primary reason, however, is that placements of call money with other foreign banks can serve the same purpose. And, since the accepting foreign banks employ most of this call money in the United States for their own operations in our money and loan markets, one can argue that the needs of market participants for contingency reserves have indirectly added to private dollar holdings in the United States. Altogether, a rough estimate would suggest that in the absence of the Euro-dollar market, foreign private holdings in the United States would be about \$3.5 billion less than their present level.

Effect of Foreign Official Transactions. As for Euro-dollar placements or dollar swap operations of foreign monetary authorities, these affect our official-transactions balance if they change Euro-dollar rates sufficiently to induce foreign commercial banks to employ additional dollar balances in the United States. To be sure, at any particular point in time a dollar deposit by a monetary authority in a foreign commercial bank, or a swap sale of dollars to such a bank, increases private balances in American banks at the expense of official holdings. But this is no more than a momentary phenomenon if on the same day, or within a day or two, the dollars are sold by the commercial bank, by the customers to whom it extends loans, or by the corporations to which the customers make payments—with other central banks, or conceivably the same monetary authority, as the ultimate buyer. In this event, which is quite usual, the official-transactions balance of the United States shows no change at all after the dollars placed in the market have come to rest.

There is little doubt, however, that large and repeated Euro-dollar placements by monetary authorities have rate effects in the market, and these may well induce Euro-dollar recipients to increase their holdings of dollar balances in the United States and cause American banks to add to their takings from their branches. These rate effects are particularly evident whenever foreign monetary authorities engage in large dollar swap transactions with their commercial banks. Inasmuch as the swap

rate they offer their banks is typically more attractive than that obtainable in the open market, the swaps contain a subsidy element. Since the banks are therefore in a position to shade their offering rate on funds placed in the Euro-dollar market, the favorable swap rate may percolate through the Euro-dollar rate structure. Swaps may exert pressure on the rate structure also by reducing the demand for Euro-dollars: banks that require dollars or other foreign currencies for loans to customers may use swap proceeds rather than dollars obtained in the market.

Euro-banks that operate simultaneously in the United States and foreign money and loan markets continuously scan interest rates and other conditions in all of these markets—and also rates in various maturity sectors of the forward market for dollars in terms of third currencies. Any decline in Euro-dollar rates will alter their portfolio decisions, and probably change their commitments in several markets. Simultaneously, offerings by private holders of liquid funds are likely also to change in response to the rate changes. On balance, it is likely that at the margin the incentive to place additional funds in the United States will increase, notably during periods when the differential between Euro-dollar rates and money-market rates in the United States is narrow.

Thus it is likely that, whenever foreign monetary authorities arrange substantial additions to the Euro-dollar supply, at least part of the increment and possibly a large part will be absorbed by the money and loan markets in the United States, rather than by the central banks of other countries or by the central bank that made the original placement. This likelihood is increased if foreign monetary authorities place call deposits in Euro-banks, since typically such balances cannot be suitably employed outside the United States. In any event, the degree of improvement in the official-transactions balance of the United States depends on a whole spectrum of spot and forward rates, and on complex elasticities of supply and demand.

Dependence of the Market on the Balance of Payments of the United States

The birth of the Euro-dollar market and the years of its rapid growth have been accompanied by massive deficits in the international transactions of the United States. As is well known, these deficits have led to a sharp rise in dollar balances held in our banks by foreign central and commercial banks, corporations, and individuals. The question has often been raised whether there is a close cause-and-effect relationship between the buildup of these foreign dollar balances and the growth of the Euro-dollar market.

On the surface it would seem surprising if the concurrence of these two developments were a mere coincidence. After all, it is for the most

part foreign-held balances that are traded in the market. It would seem logical that foreign banks and nonbanks would wish to invest in a dollar-deposit market abroad a large part of those dollar receipts that exceeded their dollar requirements. The conclusion would be that without the huge balance-of-payments deficits of the United States the market would not have developed, or at least its growth would have been greatly retarded. And it would follow that a period of balance-of-payments surpluses would be accompanied by a corresponding contraction of the market: foreign-held dollar balances would shrink and hence also the supply of funds available for Euro-dollar placements. Closer examination reveals, however, that the market's dependence on our balance of payments is much more complex.

There is no doubt that our payments deficits have contributed in some measure to the market's expansion. They have contributed directly when foreign central banks have placed funds in the market or have sold to their banking systems the dollars that exceeded the amount they desired to hold, as our deficits have largely been the source of these accumulations. And our deficits, to the extent that they have been matched by balance-of-payments surpluses in Europe, have in several ways contributed indirectly to the movement of foreign dollar balances into the market. Some European central banks have been unwilling—or unable, because their policy tools were inadequate—to sterilize the increase in commercial-bank liquidity associated with these surpluses; and at times they have prevented short-term interest rates from rising to the levels called for by prevailing inflationary conditions, fearing that any further rate rise would encourage capital inflows and thus add to inflationary pressures. Thus in several European countries there have been periods when the commercial banks' liquidity was ample enough and interest rates were low enough to permit or induce substantial investments of excess balances in the Euro-dollar market. It could be argued, too, that without the dollar surpluses associated with our deficit, some European governments might have imposed or tightened restrictions on residents' ability to place funds in that market. Finally, our deficit has indirectly led to an expansion of the market for the reason that our monetary authorities—for balance-of-payments reasons—have at times pursued somewhat more restrictive monetary policies than would have been justified by purely domestic considerations. When money-market rates rise in the United States, the rates for Euro-dollars tend to follow, and investors of liquid funds will then shift balances from national money markets to the Euro-dollar market.

The fact remains, however, that our deficits have been only one of several factors in the market's growth. Of greater significance has been the superior attractiveness of the market as an outlet for the cash balances

of banks and corporations in many parts of the world. Foreign holdings of liquid balances seeking suitable investment media have increased by leaps and bounds during the last decade. Yet, money markets in many foreign countries are quite narrow or virtually nonexistent. Therefore foreign investors of short-dated funds have had to choose by and large between our money market, that of London, and the foreign-currency deposit markets. For great numbers of them, the Euro-dollar market, with its breadth, convenience, safety, low costs of doing business, and relatively high interest rates, has proved the most attractive.

It is obvious that most of the large increase in funds abroad seeking short-term investment would have occurred even if the United States had not had balance-of-payments deficits. Actually, substantial amounts of liquid funds are invested in the Euro-dollar market by residents of countries that themselves have had deficits vis-à-vis the United States.

The fact that foreigners as a group earn more dollars than they have immediate use for does not necessarily mean that individual foreign recipients of dollar balances have either the need or the desire to invest them in the Euro-dollar market or our money market. Ordinarily, they will sell such funds in the foreign-exchange market. A very large proportion of the placements in the Euro-dollar market are made by investors that do not earn dollar balances, but acquire them with surplus funds held in their own or third currencies.

Conversely, it is unlikely that a series of balance-of-payments surpluses of the United States would automatically initiate a severe contraction in the Euro-dollar market. Placements by monetary authorities would probably shrink; and if the payments surpluses led to a reduction of bank liquidity in Western Europe, flows of bank-owned surplus funds into the market would lessen. But there would be an offsetting factor in the increase of the supply of funds by U.S. residents. Large multinational corporations that are based in the United States might well be willing to make even greater use of the foreign dollar-deposit market than in the past if an improved payments position of the United States made it possible to relax or terminate the present mandatory restraint program. And American banks, now that they have come to know the market well, and to appreciate it as a ready source of funds for augmenting their own reserve and liquidity positions, would perhaps be inclined to place there any balances that European banks were willing to bid for at rates in excess of those quoted in our markets for short-dated funds. The greater responsiveness of American banks and corporations to the pull of higher money-market rates abroad might offset a large part of any reduction in foreign dollar supplies. In fact, it may well be that these short-term capital outflows would quickly diminish and conceivably wipe out

our surpluses as computed on the liquidity basis—though not necessarily on the basis of some alternative measure.

THE MARKET'S CHALLENGES FOR MONETARY POLICY

The emergence abroad of a highly organized and efficient market for dollar deposits has greatly facilitated rapid movements of short-term capital over national frontiers. For many central banks, this greater mobility of capital has radically altered the financial environment in which they operate.

In the first place, Euro-dollar transactions can significantly influence the availability of credit—the basic variable on which central-bank policy focuses. Attempts of monetary authorities to restrict credit expansion may be hampered if commercial banks, having accepted dollar deposits available in the market, convert them into local currency for loans to domestic borrowers. Those borrowers themselves may escape monetary-policy constraints by obtaining loans in foreign or local currency from banks abroad that obtain the underlying balances in the Euro-dollar market. Banks may substitute dollar loans for local-currency loans to some customers and thereby free local-currency resources to meet the needs of others who should not have been accommodated in the light of prevailing credit restraints. A policy of monetary contraction may be impeded also by banks and corporations pulling back their placements in the Euro-dollar market. Many facts of experience could be cited to underpin these examples.

In addition, Euro-dollar transactions may importantly affect other variables of primary concern to central banks—interest rates, spot and forward rates for foreign exchange, monetary reserves, and the international balance of payments. And there is no doubt that the market has not only made the pursuit of monetary-policy objectives more difficult but also exacerbated the familiar conflicts between domestic and international policy considerations. Thus an easing of monetary policy with a view toward adding to domestic liquidity and domestic credit may be inhibited because it would at the same time exert a stimulus—undesired on domestic or international grounds—to the placement of funds in Euro-banks abroad.

Central banks have not stood idly by and let the market blunt their policy weapons. On the contrary, their response to the market has been quite vigorous and varied. On the whole, they have shown remarkable ingenuity in attempting to make the market serve, or at least not counteract, their purpose.

As noted earlier, the operations of central banks themselves have been an important factor in the growth of the Euro-dollar market. These institutions have repeatedly made use of the market to reduce excessive

monetary reserve accumulations or to absorb excess liquidity in their banking systems; conversely, they have used the market to ease prevailing monetary pressures and to gain monetary reserves by discouraging outflows or encouraging inflows. Also they have attempted, through their own operations, to lend a measure of stability to the market—and thereby to avoid or counteract undesirable repercussions in money and exchange markets—by ironing out erratic supply and rate movements. These operations have involved—*inter alia*—the placement of their own funds in the market, directly or indirectly, and intervention in the forward exchange market, in order that the covered-arbitrage incentive for others to place dollars in the market might be in line with official policy objectives. The Federal Reserve System, as the monetary authority whose currency is the instrument in which the market deals, has on a number of occasions been associated with market intervention by foreign monetary authorities. For instance, in December 1966 and repeatedly in 1967, the System agreed that it would be useful for the BIS to activate its swap line with the Federal Reserve and thus provide the BIS with the wherewithal for sizable intervention in the market. These and similar operations have helped to ease the seasonal and other disturbances that have come to characterize the market and often brought in their wake disorderly conditions in the markets for foreign exchange. The increased readiness of central banks to alleviate undesirable strains on Euro-dollar rates and supplies by intervening in the market directly and rapidly—often in cooperation with the Federal Reserve System—provides a new element of insurance against instability in the market.

Central banks have also gone to great lengths to prevent banks and corporations from making use of the market along lines considered inimical to monetary-policy objectives. As a result, in many countries the market, particularly its loan as distinct from its deposit sector, is shot through with elaborate controls. They may be classified along the following lines.

1. Restrictions on the ability of banks to escape credit restraints by extending dollar and other foreign-currency loans to domestic corporations. Such loans may be prohibited outright or they may be made subject to license requirements. Or there may be specifications regarding the type of borrower that may be accommodated.
2. Restrictions on corporate borrowings of dollars from foreign banks. Regulations in this category serve about the same purposes as the restrictions on the authority of banks to extend dollar loans to domestic customers.
3. Restrictions on the ability of banks and corporations to place dollar acquisitions in the market—either outright prohibition of such placements or the establishment of quota ceilings.

4. Restrictions affecting the ability of banks to convert dollars accepted in the market into local currency. Such conversion, again, may be prohibited, or it may be subjected to disincentives. In some countries, borrowers may not convert dollar-loan proceeds into local currency. Or borrowers are not permitted to cover forward local currencies acquired with dollar-loan proceeds.

5. Restrictions and reserve requirements that in effect either compel or induce banks to re-export any balances accepted in the market. This objective is on occasion accomplished by prohibiting banks from incurring net liabilities in foreign currency.

Altogether, there is now in several countries—notably in the United Kingdom and Italy—a formidable array of exchange controls and other regulations restricting the freedom of banks and corporations to place funds in the Euro-dollar market or to take advantage of funds available there. If these constraints had not existed, the market would probably have grown even more rapidly.

But the efficacy of the controls and restrictions should not be overestimated. The international economy is dominated by multinational corporations financed by banks whose networks of branches or affiliates stretch over several countries. In such an environment, controls applicable only in a few countries or to a limited group of financial institutions do not always work well. And rigidities of interest rates in domestic loan and deposit markets often cause funds to move through the market perversely, contrary to central-bank objectives and despite appropriate regulations.

It is not easy to appraise success and failure of the attempts to bring flows of funds through the market under control or prevent them altogether. Some market observers tend to make much of what has been achieved. Those familiar with the inner workings of the market are often less impressed. And policy makers who have to arrive at day-by-day decisions on monetary matters are only too well aware that their best-laid plans may go awry because of movements of Euro-dollar balances that are beyond their reach.

One of the major reasons why some of the measures taken lack bite is that in countries where the free market mechanism is given primacy the authorities are unwilling or unable to plug each loophole and stop each leakage—however frustrating to their objectives—by some prohibitive or restrictive act. Monetary-policy measures are typically of a general nature. At least in theory, market responses that tend to deprive such measures of their full effect can always be countered by selective controls. But some monetary authorities have for good reasons hesitated to resort to or add to such controls when banks and corporations have used funds obtained in the Euro-dollar market as an escape hatch. Not

the least of the reasons for this reluctance has been the suspicion that another control device would do no more than lead those most affected to discover some other means of escape.

There is no easy way out of the dilemmas for monetary policy associated with the emergence of the Euro-dollar system, and with other institutional developments that have fostered close integration of the world's money and capital markets. The best one can hope for is that the inevitable policy conflicts will be minimized through further international coordination of both general and selective measures.

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