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PAPER NO. 12

THE EURO-DOLLAR MARKET AND ITS PUBLIC POLICY IMPLICATIONS

MATERIALS PREPARED FOR THE
JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

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LETTERS OF TRANSMITTAL

FEBRUARY 20, 1970.

To Members of the Joint Economic Committee:

Transmitted herewith is a study presented as No. 12 in our series on economic policies and practices in industrial countries and entitled "The Euro-Dollar Market and Its Public Policy Implications." This analysis was prepared by Ira O. Scott, Jr., professor of finance and dean of the Arthur T. Roth School of Business Administration at the C. W. Post Center of Long Island University, Brookville, N.Y.

As a nontechnical survey of the origins of the Euro-dollar market and its current operation and status, this study is relevant to any consideration of U.S. balance-of-payments problems and of how the U.S. banking system participates in the international transfer and utilization of internationally mobile capital.

The views expressed in this paper are, of course, exclusively those of the author and do not necessarily represent the views of the Joint Economic Committee, individual members thereof, or its staff.

Sincerely,

WRIGHT PATMAN,
Chairman, Joint Economic Committee.

FEBRUARY 19, 1970.

Hon. WRIGHT PATMAN,
Chairman, Joint Economic Committee,
U.S. Congress, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is an analysis of "The Euro-Dollar Market and its Public Policy Implications." Recently the Euro-dollar market has expanded rapidly in size, and its impact on the U.S. balance of payments has grown correspondingly. Deposits attracted by U.S. banks via the Euro-dollar market expanded so rapidly in 1969 that the Federal Reserve came to view the market as a mechanism for circumventing its stringent domestic monetary policies. It consequently imposed reserve requirements on deposits from abroad similar to those specified for deposits by U.S. residents. Moreover, by attracting funds formerly held by official foreigners, U.S. banks operating in the Euro-dollar market have at least temporarily reduced our payments deficits. But a possible reflux of the same funds might worsen the U.S. external position in the future. Thus, this study of the Euro-dollar market is extremely relevant to current economic issues.

The study has been prepared by Ira O. Scott, Jr., professor of finance and dean of the Arthur T. Roth School of Business Administration at the C. W. Post Center of Long Island University, Brookville, N.Y. The paper is presented as prepared by Dean Scott and does not necessarily represent the view of the committee, individual members thereof, or of any staff member.

At the request of the full Joint Economic Committee, this study of the Euro-dollar market was commissioned by the Subcommittee on International Exchange and Payments and is presented as No. 12 in the Committee's series on Economic Policies and Practices. This series was instituted several years ago as a means of making information on economic institutions in industrial countries more easily available to Members of Congress and the general public. Since Dean Scott's paper includes a nontechnical description of the origins of the Euro-dollar market, how it operates, its current stage of development, and the policy questions its existence has raised, his study is a logical addition to this series.

Sincerely,

HENRY S. REUSS,
Chairman, Subcommittee on International Exchange and Payments.

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THE EURO-DOLLAR MARKET AND ITS PUBLIC POLICY IMPLICATIONS*

By Ira O. Scott, Jr.**

I. Purpose and Description of the Study

Financial capital crosses the geographical frontiers of national political units whenever domestic or internationally accepted means of payment pass from the hands of residents into those of nonresidents. International capital flows occur in response to differentials in expected rates of return whenever artificial impediments to such flows either are absent or are reduced. When the redistribution of financial capital in this way leads to a corresponding movement of capital in real form, the overall productivity of real capital tends to increase and thus to contribute to the growth of real income.

In addition to the possibility of having favorable effects upon the output of goods and services, international capital flows may affect a country's balance of payments and the level of the domestic money supply. From these possible effects stem the public policy implications of freeing international capital movements.

In 1958, with the widespread return to currency covertibility,[1] the Western World emerged from an era of exchange restrictions imposed during the Second World War and its aftermath. The past decade, therefore, has witnessed an increased mobility of financial capital. Domestic liquidity and the balance of payments have been affected by these capital flows. Important public policy issues have grown out of these events and developments.

The present study is focused upon the foreign market for U.S. dollars, generally known as the Euro-dollar market. This market has been an important outgrowth of the liberalization of capital movements. The market has affected the balance of payments position of the United States. It has influenced the U.S. money supply. Since the Congress of the United States is the final arbiter of public policies affecting the balance of payments and the money supply, the purpose of the present study is to provide Members of Congress with a review of the developments and structure of the Euro-dollar market and an analysis of its implications.

The next section of the study is devoted to the structure of the market. Sources and uses of funds will be identified, the volume of transactions estimated, and the market mechanism described.

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*See the Bibliographical Appendix (p. 35) for a number of references to the Euro-dollar market.

**With the caveat that the author accepts full responsibility for the views expressed in this paper, he wishes to acknowledge his debt to the following readers: Geoffrey L. Bell, Sir George Bolton, Lawrence Chimerine, Emilio G. Collado, Julie C. Esrey, John B. Henderson, Bernd E. Karl, John Karlik, Fred H. Klopstock, Warren D. McClam, Donald H. MacDonald, Helmut Meyer, Thomas Roche, Robert L. Sammons, and Sir John Stevens.

[1] For current transactions mainly, and often for non-residents only.

In the third section of the study, the special role of U.S. commercial banks in the market is examined in greater detail. Also considered are the implications of the growth of the market for international capital flows, the U.S. balance of payments, and the U.S. monetary policy.

Finally, policy issues growing out of the study's findings are examined.

II. Structure of the Euro-Dollar Market

1. A definition, and the element of risk

Like the Holy Roman Empire, which was neither holy, Roman, nor an empire, the so-called Euro-dollar market is neither European nor a market for dollars. It is, rather, the market for bank deposits which are denominated in foreign currencies. In other words, the deposits are in the form of currencies other than that of the country in which the bank is located.[2] The list of foreign, or "guest", currencies include the pound sterling, the Swiss franc, the German mark, the Dutch florin, the French franc, and the Italian lira. The basis for the appelation, "Euro-dollar," lies in two factual aspects of the market.

First, most of the banks who accept these nonresident funds in the form of foreign currency deposits are located in Europe. Second, the great preponderance of such deposits is denominated in U.S. dollars. Consequently, transactions in the Euro-dollar market consist primarily of purchases and sales by European banks of the demand liabilities of U.S. banks.[3] The present study will, in any case, focus on the U.S. dollar sector of the market.

The element of risk permeates any money market, and the Euro-dollar market is no exception. It was born of the fear that dollars owned in Eastern Europe but left on deposit in the United States might be attached by U.S. residents with claims against Eastern European governments. It is nurtured by differentials in rates of return that take account of the risk of potential currency restrictions. Thus, a Euro-dollar deposit must be distinguished from the deposit liability of a U.S. bank. This is because of the risk that exchange restrictions might be imposed by the "host" country impairing the owner's control over the disposition of the "guest" currency. This risk is presumed to be greater than that created by the possibility of exchange controls in the United States. In any case, the former risk would probably be compounded by the latter.[4]

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[2] Some analysts, on the other hand, do carefully restrict the use of the phrase, "Euro-dollar market," to the market for U.S. dollars centered in Europe.

[3] Thus, acceptance by a foreign bank of dollar deposits in a U.S. bank at a certain rate of interest may be thought of as a purchase, while the placement of funds in the market may be considered a sale of dollar deposits. The repayment or withdrawal of funds might then be treated as a repurchase.

A foreign bank which receives funds has a dollar liability to the depositor or seller. Since the funds received or purchased are the deposit liabilities of a U.S. bank, the receiving bank counts among its new assets a claim on a U.S. bank. The receiving bank may then place the funds with another foreign bank. Afterwards, the original receiving bank has a liability to the depositor and a claim on another foreign bank. The latter bank, in turn, now owns the claim on the U.S. bank.

[4] The Euro-dollar market thus presents an enigma—an exception to the Schumpeterian dictum that "a dollar is a dollar is a dollar?"

Indeed, a distinction must even be made between U.S. bank deposit liabilities to residents and nonresidents. That is, the odds in favor of exchange controls are presumably greater than those in favor of a bank holiday at home. And, again, the former risk is likely to be compounded by the latter.

2. ORIGINS OF THE MARKET

The EURO-dollar market is, by any standard, the freest sector of the international money market. It is ironical, therefore, that the origin of the market is attributed by some to the placement by various State banks in the Soviet Union and elsewhere in Eastern Europe of U.S. dollars with two Soviet-owned banks, the Moscow Narodny Bank, of London, and the Banque Commerciale pour L'Europe du Nord, of Paris. These State banks apparently preferred to place their holdings of U.S. dollars with the Soviet-owned banks as a means of reducing the risk of having their funds blocked. In any case, a number of factors may be cited as contributing to the development of the EURO-dollar market.

The fundamental economic reason for the emergence and growth of the EURO-dollar market is that the participating European banks [5] have been able to establish competitive spreads between creditor and debtor rates of interest. On the creditor side,[6] European banks have been able to offer competitive rates of interest because—unlike their U.S. counterparts—they are not subject to cash reserve requirements, deposit insurance assessments, regulation Q,[7] or to a prohibition on the payment of interest on demand deposits with a maturity of less than 30 days.[8] They have also been able to compete with nonbank investment media in the New York money market.

On the debtor side,[9] European banks have often been in a position to undercut, in their dollar loan operations, interest-rate floors established by local cartels or official bodies which govern accommodations in domestic currencies.

Restrictive covenants growing out of the U.S. balance-of-payments control program and which apply to the overseas lending operations of banks in the United States also account in part for the advantageous position of the European banks.

Dollar lending operations outside the United States were made feasible by the general return to currency convertibility in 1958. Toward the end of 1958, the United Kingdom merged American-account and transferable-account sterling. Simultaneously, Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, and Portugal moved toward current account convertibility for nonresidents. Increasing prestige and authority enjoyed by the International Monetary Fund (IMF) and the European Economic Community (EEC) instilled increasing confidence in the viability of the fixed exchange rate system.

Technical leadership of the EURO-dollar market was easily captured by the British overseas, foreign, and merchant banking houses of the city of London. This role was assured by their longstanding position of dominance in the international money market. It was also promoted by the British restrictions of 1957. At that time, sterling loans in the form of trade credits beyond the normal financing periods and to finance third party trading activities were prohibited. Shut out of

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[5] These include the overseas branches of U.S banks.

[6] That is, in attracting deposits.

[7] This regulation, promulgated by the Board of Governors of the Federal Reserve System, places ceiling limitations on the rates of interest which U.S. banks may pay on time and savings deposits liabilities to U.S. residents.

[8] These European banks, are, of course, subject to various controls imposed by the governments of the countries in which they operate.

[9] That is, in making loans.

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a traditional area of operation, the international deposit-taking banks in London eagerly developed the EURO-dollar market as a substitute financing mechanism.

With its economic basis, feasibility, and technical aspects provided for, the market mechanism lacked only the fuel, which was to be liberally supplied by continued deficits in the U.S. balance of payments.[10]

3. SUPPLIERS OF FUNDS

The primary suppliers of funds to the EURO-dollar market have been commercial banks, central banks, international monetary institutions, nonfinancial institutions, and individual investors. Commercial bank recipients of dollar deposits in countries without organized money markets utilize the EURO-dollar market as an outlet for short-term funds. Those in countries having some semblance of a money market are still attracted to the EURO-dollar market when rates of return there are high relative to those obtainable from investment in domestic money market instruments.

Central banks have also been important suppliers of dollars to the market. When they receive dollars through their normal foreign exchange operations, these dollars may be placed in the market in several ways. First, they may be loaned to commercial banks in the central bank's own country, or the dollars may be sold to these banks against domestic funds.[11] The same dollars might then enter the EURO-dollar market through commercial bank placement.

Second, a central bank may place the dollars indirectly in the market through the Bank for International Settlements (BIS). Finally, a central bank may place the dollars directly in the market through their deposit with a foreign, non-U.S. commercial bank.

International monetary institutions, such as the BIS and the European Investment Bank (EIB), make short-term foreign currency deposits with participating commercial banks. The BIS is reportedly a major market operator in disposing of dollars deposited with it by member central banks.

The large American nonfinancial corporation with important foreign operations quickly grasped the opportunities afforded by the EURO-dollar market as a substitute for the investment of short-term funds in New York. The market appealed similarly to multinational corporations based in other countries and to wealthy individual investors in disparate parts of the globe.

U.S. companies that float foreign dollar bonds through their Delaware subsidiaries are forced for tax reasons to keep the proceeds of these issues outside the United States until used to finance overseas investments. The proceeds are thus regularly placed in the EURO-dollar market.

Finally, from varied sources, the market is, on occasion, deluged by short-dated funds of a speculative character.

The market has, as well, long been a haven for expatriate wealth seeking refuge from local political risks and tax exposure.

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[10] The relationship between the EURO-dollar market and the U.S. balance of payments will be discussed in greater detail later.

[11] Preferential swap facilities have been offered to their banks by central banks in Germany, Italy, the Netherlands and Switzerland.

4. DEMANDERS OF FUNDS

The final users of funds in the EURO-dollar market include commercial banks, securities brokers and dealers, exporters and importers, finance companies, governmental units, and international corporations. The foreign branches of U.S. commercial banks have transferred dollar deposits to their head offices as a means of shoring up the latters' cash positions. Canadian commercial banks have used the proceeds of U.S. dollar deposits to make "street" loans in New York.[12] Commercial banks generally have used dollars to make loans to exporters, importers, and to local customers.

London banks have channeled funds raised in the EURO-dollar market, and swapped into sterling, to the U.K. hire-purchase companies and local governmental authorities. The former supply consumer credit. The latter finance the construction of housing, schools, sewers, and waterworks. Belgian banks have raised funds in the market to be used in financing the budget deficit of the Belgian central government.

International corporations—especially those in petroleum, chemicals, minerals, and other commodities widely traded internationally—are among the major borrowers of EURO-dollars. The Norwegian shipping industry, Japanese companies, Italian concerns and German industrial houses have all received loans originating in the EURO-dollar market. American companies doing business abroad rely on the market as a means of complying with the provisions of the U.S. balance-of-payments control program.

5. THE SIZE OF THE MARKET

There are no available statistics which measure the volume of transactions in the EURO-dollar market. An indication of the size, relative importance, and growth of the market may, however, be gained from figures for assets and liabilities of European banks which are denominated in foreign currencies. Such figures are gathered by the BIS from banks in Belgium-Luxembourg, France, Germany, Italy, the Netherlands, Sweden, Switzerland, and the United Kingdom. The assets and liabilities reported are denominated in U.S. dollars, British sterling, Swiss francs, Deutsche marks, French francs, Dutch florins, and Italian lire. These asset and liability figures are inflated both by a substantial amount of redepositing between banks and by certain positions which are not related to EURO-dollar market transactions. At the same time, they do not include positions vis-a-vis residents nor the intake or placement of dollars in the form of swaps. In table 1, an allowance is made for these various factors. These figures represent BIS estimates of the scale of activity in the market on the basis of the principal sources and uses of funds for the eight reporting European countries.

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[12] This particular type of transaction was common before the development of the EURO-dollar market.

TABLE 1.—ESTIMATED SIZE OF THE EURO-DOLLAR MARKET

[Yearend figures in billions of U.S. dollars]

Items	1964	1965	1966	1967	1968
Sources:					
Outside area:					
United States and Canada	1.5	1.3	1.7	2.6	4.5
Japan	.3	.3	.4	.5	.6
Eastern Europe	2.8	3.3	4.0	4.8	6.6
Other					
Total	4.6	4.9	6.1	7.9	11.8
Inside area:					
Nonbanks	1.8	2.2	2.8	3.9	5.2
Banks	2.6	4.4	5.6	5.7	8.0
Total	4.4	6.6	8.4	9.6	13.2
Grand total	9.0	11.5	14.5	17.5	25.0
Uses:					
Outside area:					
United States and Canada	2.2	2.7	5.0	5.8	10.2
Japan	.4	.5	.6	1.0	1.7
Eastern Europe	.5	.5	.7	.8	.9
Other	.9	1.5	1.9	3.0	4.2
Total	4.0	5.2	8.2	10.6	17.0
Inside area:					
Nonbanks	2.3	3.3	3.7	4.1	4.7
Banks	2.7	3.0	2.6	2.8	3.3
Total	5.0	6.3	6.3	6.9	8.0
Grand total	9.0	11.5	14.5	17.5	25.0
Net: [1]					
Outside area:					
United States and Canada	+.7	+1.4	+3.3	+3.2	+5.7
Japan	+.4	+.5	+.6	+1.0	+1.6
Eastern Europe	+.2	+.2	+.3	+.3	+.3
Other	−1.9	−1.8	−2.1	−1.8	−2.4
Total	−.6	+.3	+2.1	+2.7	+5.2
Inside area:					
Nonbanks	+.5	+1.1	+.9	+.2	−.5
Banks	+.1	−1.4	−3.0	−2.9	−4.7
Total	+.6	−.3	−2.1	−2.7	−5.2

[1] A plus sign indicates that the area or grouping in question is a net user of Euro-dollar funds, whereas a minus sign indicates that it is a net supplier.

Source: Bank for International Settlements, 39th Annual Report, Apr. 1, 1968–Mar. 31, 1969 (Basle, June 9, 1969), p. 149.

The BIS divides the sources and uses of Euro-dollars between those inside and those outside the eight reporting countries. The "outside" components, in turn, are divided between those in the United States and Canada, Japan, Eastern Europe, and those located elsewhere outside the reporting area. "Inside" sources and uses are classified according to whether the reporting bank has (1) received dollars from, or loaned them to individuals or nonbank institutions located within the reporting area, or (2) received dollars, or loaned them to banking institutions within the reporting area.

Certain conceptual difficulties hamper any attempt to quantify the size and structure of the Euro-dollar market. One difficulty concerns the treatment of dollar positions vis-a-vis the United States. Long before the market was established, foreign banks had dollar liabilities arising out of the use of credit lines established with U.S. banks and dollar assets in the form of working balances and money market media of various kinds. Since these items do not form a part

of the EURO-dollar market, they are excluded, on the basis of rough estimates, from the figures presented in table 1.[13]

According to the BIS estimates, the EURO-dollar market has expanded from about $9.0 billion in 1964 to $25.0 billion in 1968.[14] During this period, a marked change occurred in the structure of the market. At the beginning of the period, the United States and Canada, Japan, Eastern Europe, and the reporting European area were all net users of funds. The "other outside area" was the only net supplier. This area consists mainly of the Middle East, Latin America, and "other Western Europe."

By the end of the period, the relative importance of the "other outside area" as a net supplier had decreased; while the reporting area itself had become the chief supplier of EURO-dollar funds. At the same time, the importance of North America as a user of funds had increased dramatically.

Looking to the sources side of the market, EURO-dollar funds supplied by North America have expanded significantly. This has been the case in spite of the U.S. balance of payments control program. There was a $0.2 billion decline in 1965, the year the program was introduced. But by 1968, supplies from North America had risen to $4.5 billion. About $2.5 billion of this increase was vis-a-vis the United States and largely reflected the deposits by U.S. companies of funds raised in European financial markets.

On the uses side, North America accounted for an increase of $8.0 billion, or roughly half of the growth of the market since 1964. These increased takings were particularly pronounced in 1966 and 1968 as a result of borrowing by U.S. banks. In 1968, moreover, direct EURO-dollar borrowing by U.S. companies appears to have achieved considerable importance.

6. THE MARKET MECHANISM

A number of parallels may be drawn between the EURO-dollar market and the market for Federal funds in the United States. In the Federal funds market, commercial banks which are members of the Federal Reserve System trade demand deposits held with the Federal Reserve banks. These deposits serve as legal reserves, but also as working balances which may be converted into earning assets through placement with other member banks or through conversion into loans or investments. The Federal funds market is an over-the-telephone market.[15] Transactions are noncollateralized. Transactors are mainly banks. Some of these banks make a market by taking positions. Others enter the market only to serve their own immediate needs. Transactions are large—in million dollar blocks for the most part.

Responsibility for these market decisions falls upon the shoulders of the officer who manages his bank's money desk. Money brokers serve on a commission basis, as go-betweens for buying and selling banks.

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[13] For a discussion of these and other conceptual and statistical difficulties, see Bank for International Settlements, 39th Annual Report, Apr. 1, 1968–Mar. 21, 1969, pp. 147–149.

[14] On June 19, 1969, BIS Manager D. H. MacDonald put the size of the market at $30 billion. (See *The New York Times*, June 20, 1969.)

[15] Teletype facilities are also used.

In the EURO-dollar market, foreign commercial banks, for the most part, are trading demand deposits held with commercial banks in the United States. These deposits are converted into earning assets through interest arbitrage operations with other foreign banks or through direct conversion into loans or investments. The EURO-dollar market is an over-the-telephone market. Deposits are received without the pledge of collateral. Trading units are usually in blocks of $1 million or more. Some banking participants play an accommodating role as intermediaries, bridging the gap between the supply and demand sides of the market. Some banks are mainly users of deposits, converting them immediately into end-use loans. The manager of the bank's money position determines his bank's position in the EURO-dollar market.

Whereas the Federal funds market is an overnight or over-the-weekend market, EURO-dollar commitments vary from call to 7 days, to 1 month, 3 months, and longer.

Negotiable time certificates of deposit (CD's) are also issued in EURO-dollars, usually for maturities of 30 days or longer.

The international character of the EURO-dollar market is accentuated by the integral role played by the foreign exchange market in the transformation of EURO-dollar deposits into loans of a domestic currency. The efficiency of the EURO-dollar market depends, in large measure, upon the existence of an efficient forward exchange market. Whenever a holder of dollars converts them into another currency—to finance a loan, an investment, or a transaction in international trade—the forward exchange market provides the means of eliminating the exchange risk. The manager of the money desk of a large European bank may, therefore, serve also as the bank's chief foreign exchange trader.

The simplest form of a EURO-dollar transaction consists of an interest arbitrage operation on the part of a European bank which pays one interest rate for a deposit and puts the funds received on deposit with another bank at a slightly higher rate of interest.[16] Such a sequence of interbank deposits may involve a number of banks before the chain is broken by a loan to a nonbank borrower.

EURO-dollar loans by European banks to nonbank borrowers may take several forms. EURO-dollars may be borrowed to finance imports from the United States when this method of financing is cheaper than drawing bankers' or trade acceptances, borrowing from an American bank, or obtaining a foreign currency loan, the proceeds of which are converted into dollars through the foreign exchange market. Eventually, the dollar obligation will be liquidated through the acquisition of dollars in the foreign exchange market.

EURO-dollars may be borrowed to finance imports from countries other than the United States. Settlement may be made in dollars, or the borrowed dollars may be converted into the third country's currency.

Exporters to the United States may borrow EURO-dollars and buy their domestic currency in the spot market. Given a deep discount on the forward dollar, this may be less expensive than borrowing the domestic currency and selling dollars forward.

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[16] The existence of an interest rate differential that permits such an arbitage operation may stem from the risk of exchange control, a lower credit standing of the second bank, or from the fact that the second bank has an opportunity to use the funds more profitably than the first.

EURO-dollars may be borrowed to finance long positions in other foreign currencies or in gold.[17]

A commercial bank may borrow EURO-dollars, convert them to the domestic or a third currency, and make a customer loan. To avoid the exchange risk in such a transaction, the bank will buy dollars forward at the same time it sells them spot.

The New York agencies of Canadian banks invest funds in the New York money market which have been deposited with their European branches or with their head offices in Canada.

In addition to accepting EURO-dollar demand and time deposits, some foreign branches of U.S. banks issue CD's to foreign banks, companies, and individuals. These CD's are offered in denominations of $25,000 or greater, for minimum maturities of 30 days, and at rates of interest sometimes below the EURO-dollar rates on deposits of corresponding maturities. Unlike their domestic counterparts, EURO-dollar CD's are not subject to regulation Q; they are not sold to U.S. citizens; and they are not redeemable in New York. There is, however, a secondary market for them in London. This market enhances the liquidity of the CD as a money market instrument and accounts for the fact that they may be issued at rates of interest less than those available on EURO-dollars.

The interest arbitrage operations of EURO-dollar banks give rise to a pyramiding of interbank deposits. In virtually every instance of an interbank EURO-dollar deposit, there is a transfer on the books of a bank in the United States. The account of the depositing bank is debited; that of the accepting bank credited. There may, therefore, be a pyramiding of a number of interbank deposits on the basis of a given dollar deposit in a bank which is located in the United States.

The European banks which form the interbank deposit chains tend to maintain the same, or nearly the same, dollar asset and liability maturities. This correspondence of maturities reduces the need to maintain a precautionary cash reserve with a U.S. bank. Those banks, however, which are actively engaged in EURO-dollar trading operations do carry small balances with their American correspondents. These are compensating balances which serve to defray the cost of clearing the deposit transfers that are the U.S. counterparts of the EURO-dollar chains. Interest rate margins earned on these arbitrage operations are narrow. Hence, they would be rendered unprofitable by anything more than minimal deposit balances in the United States.

The potential expansion of interbank deposits on a given U.S. deposit base is virtually unlimited. However, a chain may, at any point, be broken by a bank which finds it more profitable to lend the funds to a nonbank borrower rather than redeposit them with another bank. Moreover, some banks will accept funds only if they can serve end-use purposes.

The interest rate margin earned by the deposit-placing bank presumably includes a risk premium. This risk premium may be due to the relatively small size of the receiving bank's aggregate resources, or it may reflect the relative weakness in its local currency. The risk element may grow at each successive stage. At the point it fully absorbs the profit margin, the pyramiding process comes to an end.

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[17] Cf. James R. Hambleton, "Gold Rush Financing Debt—and Dangerous," *American Banker*, March 22, 1968.

These redeposit chains probably enhance the efficiency with which capital is allocated by the international banking system. Interbank time-deposit assets do not, however, contribute directly to the financing of expenditures. Only when a loan is made to a nonbank borrower are total expenditures and the level of economic activity affected.[18]

The EURO-dollar loan mechanism must be distinguished from the interbank deposit pyramid. A loan to a nonbank borrower will be made, for example, either through a credit to the borrower's account, an overdraft facility, or through a credit to the borrower's account in the United States. To use the funds, the borrower may draw checks on his dollar account or instruct the lending bank to convert the proceeds of the loan into specified foreign currencies. If the dollars which have been borrowed and spent are redeposited with a European bank, they may be re-lent again; and the cycle repeats itself.

The loan deposit sequence described above has been likened by Geoffrey Bell[19] and others to the money expansion process characteristic of the United States and other banking systems. The EURO-dollar expansion multiplier is potentially large, because many European banks are not required to hold dollar cash reserves with their central banks.[20] Nor do the European banks have more than a minimal need for contingency reserves. The multiplier concept is, in any case, useful only as an explanatory device and in an *ex post* sense. There is no theoretical limit to the multiplier in an open system.

For time deposits, the need for reserves is virtually nil, because the maturity dates of the deposits are, for the most part, known in advance. For call or current account balances, a number of substitutes for dollar cash reserves may be used. Local currency cash balances may be converted into dollars should the need arise. Credit lines may be maintained with American banks. Finally, contingency balances are typically placed at call with the overseas branches of American banks, Canadian banks, or other foreign banks with agencies or branches in the United States.[21]

The expansion process may be fueled in several ways. Multinational companies, foreign affiliates of American corporations, and nonbank financial institutions abroad may maintain EURO-dollar accounts, from which disbursements are made and into which some of the proceeds of EURO-dollar loans may well be paid. The proceeds of medium-term dollar loans may be placed in the EURO-dollar market. Finally, some of the dollars put into the market by central banks may have originated in EURO-dollar loans.

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[18] Even in this case, economic aggregates would be affected only if the loan would not otherwise have been made. If it were not for the availability of a credit in the EURO-dollar market, central banks might have provided easier domestic monetary policies.

[19] *Cf.* Geoffrey L. Bell, "Credit Creation Through EURO-dollars?" *The Banker*, August 1964, pp. 2–8.

[20] There may, of course, be reserve requirements of a conventional sort.

[21] American banks with overseas branches mingle these funds with their other short-dated assets, including those obtained in the Federal funds market. Canadian and other foreign banks with agencies or branches in New York may place these balances in the call loan market in New York, usually for the purpose of financing securities brokers and dealers.

On the basis of such an expansion process, Bell estimates the multiplier to be well in excess of 1.[22] Klopstock, on the other hand, puts the EURO-dollar multiplier in the 0.50 to 0.90 range.[23] Klopstock argues that leakages from the system are large. As noted before, the borrower may immediately convert the proceeds of his dollar loan into another currency. If dollars are actually paid out by the borrower, the recipient of the funds may well be a resident of the United States who deposits funds in his U.S. bank account rather than in an account with a European bank. If the recipient of the funds is a foreigner, he more than likely will immediately convert the dollars into another currency. It is true that dollars which are sold against a European currency may end up in the hands of a European central bank which puts the dollars back, directly or indirectly, into the EURO-dollar market. On the other hand, the European central bank may convert the dollars into gold or invest them in the New York money market. The existence of such leakages, of course, limits the size of the expansion multiplier.

The impact of the EURO-dollar market upon world liquidity is not restricted, however, to the multiplier process. EURO-dollar deposits have a remarkable growth record. But much of this growth is due to the strong competitive position of the European banks. They do not have to maintain cash reserve requirements or pay deposit insurance fees on deposit liabilities. They may pay interest on deposits with a maturity of less than 30 days. They are usually not subject to ceiling limitations on interest rates paid on foreign currency deposits with a maturity of 30 days or more. They have often benefited from advantageous terms in swap arrangements with central banks. Regardless, therefore, of leakages in the multiplier process, European banks have been able to replenish and expand their dollar liabilities with great success.

III. THE ROLE OF THE EURO-DOLLAR MARKET IN U.S. COMMERCIAL BANK OPERATIONS

1. MANAGEMENT OF A COMMERCIAL BANK MONEY DESK

The manager of the money position of a commercial bank in the United States is responsible for maintaining a legal reserve position for his bank. Depending upon the structure of interest rates, the bank's size, and the past and present policies of its management, this officer will select one or more sources to satisfy a need for cash. These sources of funds include the Federal funds market, the Federal Reserve discount window, the issuance of CD's, the purchase of EURO-dollars, the sale of securities, borrowing from a correspondent, the sale of commercial paper through one-bank holding companies, the sale of loan participations, the arrangement of repurchase agreements, and the curtailment of loans. The maturity of the funds acquired will be determined, in part, by official regulations, market rates of interest, and the length of time it is anticipated the funds will be needed. The commercial bank thus provides a key link between the markets for these various sources of funds. In turn, the EURO-dollar market, among others, may play a key role in the money position management o a commercial bank.

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[22] See Bell, *op. cit.* In other words, according to the Bell estimate, the initial deposit of a dollar in the EURO-dollar market would eventually give rise to more than a dollar in EURO-dollar deposits as a result o the redeposit of the proceeds of EURO-dollar loans.

[23] *Cf.* Fred H. Klopstock, *The EURO-dollar Market: Some Unresolved Issues*, Essays in International Finance, Princeton University, No. 65 (March 1968).

2. THE EFFECT OF REGULATION "Q"

The Federal Reserve System has, in recent years, effectively employed the ceiling limitation on time deposits as an instrument of anti-inflationary monetary policy. First, through the open market account, money market rates of interest are driven above the ceiling on interest rates which banks may pay on CD's. As a result, investors may permit their CD's to mature and invest the proceeds in higher yielding money market paper. The banking system thus finds a shift in its liabilities from the time to demand category. Since reserve requirements for demand deposits are higher than those for time deposits, this shift is equivalent to raising the weighted, or effective, cash reserve requirement which must be maintained by the banking system. As a result, the banks are forced into a deflationary posture.

A severe runoff in CD's of this kind occurred during the second half of 1966. There was a 5½-percent ceiling on interest rates which could be paid on large time deposits.

By September 1966, on the other hand, Treasury bills were yielding 5.36 percent, finance paper 5.67 percent, bankers' acceptance 5.75 percent, and dealer paper 5.89 percent. The effective rate of return to the investor on CD's is actually greater than the stated rate, because the latter is computed on a 360-day, rather than a 365-day, basis. (See table 2.) However, given their risk characteristics, rates of return on these money market instruments were competitive with the 5.576 percent effective return which could be realized on a 5½-percent CD. In view of the higher rates afforded by alternative investments, corporate treasurers and other investors began shifting from time deposits to money market media. As a result, total CD's outstanding fell from $18,272 million on July 27, 1966, to $15,460 million on November 30, 1966. (See table 3.)

TABLE 2.—CERTIFICATE OF DEPOSIT RATE COMPARISON

Stated rate [1]	Effective rate [2]	Effective cost [3]	Stated rate [1]	Effective rate [2]	Effective cost [3]
4½	4.562	4.879	5.30	5.374	5.730
4.55	4.613	4.931	5.35	5.424	5.790
4.60	4.664	4.986	5⅜	5.450	5.817
4⅝	4.689	5.013	5.40	5.475	5.843
4.65	4.715	5.039	5.45	5.526	5.897
4.70	4.765	5.097	5½	5.576	5.951
4¾	4.816	5.147	5.55	5.627	6.004
4.80	4.867	5.201	5.60	5.677	6.058
4.85	4.917	5.254	5⅝	5.703	6.085
4⅞	4.943	5.281	5.65	5.728	6.111
4.90	4.968	5.308	5.70	5.779	6.166
4.95	5.019	5.362	5¾	5.829	6.220
5.00	5.069	5.415	5.80	5.880	6.273
5.05	5.120	5.464	5.85	5.931	6.327
5.10	5.171	5.512	5⅞	5.956	6.354
5⅛	5.196	5.549	5.90	5.981	6.380
5.15	5.222	5.575	5.95	6.032	6.434
5.20	5.272	5.629	6.00	6.083	6.487
5¼	5.323	5.683			

[1] Rate of interest paid on the CD.
[2] Rate of interest received by the investor calculated on a 365-day basis.
[3] Effective rate adjusted for FDIC assessments and a 6-percent reserve requirement.

Source: Chase Manhattan Bank. A 6-percent reserve requirement is assumed.

TABLE 3.—MATURITY DISTRIBUTION OF OUTSTANDING NEGOTIABLE TIME CERTIFICATES OF DEPOSIT

Date	Total outstanding (in millions of dollars)	Percentage maturity within 5 months	Date	Total outstanding (in millions of dollars)	Percentage maturity within 5 months
May 20, 1964	11,736	72	Aug. 30, 1967	20,741	78
Aug. 19, 1964	12,193	77	Sept. 27, 1967	19,899	78
Nov. 18, 1964	12,740	84	Oct. 25, 1967	20,108	79
Feb. 17, 1965	13,747	80	Nov. 29, 1967	21,132	82
May 19, 1965	15,058	76	Dec. 27, 1967	20,328	83
Aug. 18, 1965	16,009	79	Jan. 31, 1968	20,919	82
Nov. 17, 1965	16,368	82	Feb. 28, 1968	21,086	83
Feb. 16, 1966	16,356	81	Mar. 27, 1968	20,554	84
May 18, 1966	17,724	75	Apr. 24, 1968	19,789	84
June 29, 1966	17,898	73	May 29, 1968	19,453	80
July 27, 1966	18,272	77	June 26, 1968	19.269	76
Aug. 31, 1966	18,192	80	July 31, 1968	21,449	70
Sept. 28, 1966	16,968	80	Aug. 28, 1968	22,306	77
Oct. 26, 1966	15,891	81	Sept. 25, 1968	22,258	78
Nov. 30, 1966	15,460	82	Oct. 30, 1968	23,303	79
Dec. 28, 1966	15,633	80	Nov. 27, 1968	24,307	80
Jan. 25, 1967	17,850	74	Dec. 25, 1968	23,500	78
Feb. 22, 1967	18,553	75	Jan. 29, 1969	21,032	76
Mar. 29, 1967	19,300	73	Feb. 26, 1969	19,971	79
Apr. 26, 1967	18,581	74	Mar. 26, 1969	18,787	79
May 31, 1967	19,076	74	Apr. 30, 1969	17,622	82
June 28, 1967	19,151	73	May 28, 1969	16,973	82
July 26, 1967	19,695	76	June 25, 1969	15,270	(1)

[1] Not available.

Source: Board of Governors, Federal Reserve System. These figures are based upon the maturity structure of CD's in denominations of $100,000 or more outstanding at weekly reporting banks.

3. ROLE OF THE EURO-DOLLAR MARKET

It was this credit "crunch" of 1966 that projected the Euro-dollar market into the role of being a major source of funds for leading U.S. banks. These banks, primarily through their branches in London and other major international financial centers, dramatically increased their use of the market as a means of improving their reserve positions. On July 27, 1966, total liabilities of U.S. banks to their foreign branches amounted to $2,786 million. (See table 4.) By December 28 of the same year, these liabilities had reached a total of $4,036 million.

TABLE 4.—LIABILITIES OF U.S. BANKS TO THEIR FOREIGN BRANCHES

[In millions of dollars]

	Amount
1964:	
Jan. 29	1,040
Feb. 26	1,077
Mar. 25	1,046
Apr. 29	1,146
May 27	1,132
June 24	917
July 29	1,008
Aug. 26	1,166
Sept. 30	1,166
Oct. 28	1,198
Nov. 25	1,380
Dec. 30	1,183
1965:	
Jan. 27	1,358
Feb. 24	1,592
Mar. 31	1,431
Apr. 28	1,433
May 26	1,432
June 30	1,436
July 28	1,572
Aug. 25	1,792
Sept. 29	1,611
Oct. 27	1,719
Nov. 24	1,697
Dec. 29	1,345
1966:	
Jan. 26	1,688
Feb. 23	1,902
Mar. 30	1,879
Apr. 27	1,909
May 25	2,003
June 29	1,951
July 27	2,786
Aug. 31	3,134
Sept. 28	3,472
Oct. 26	3,671
Nov. 30	3,786
Dec. 28 [1]	4,036
1967:	
Jan. 25	3,653
Feb. 22	3,396
Mar. 29	3,412
Apr. 26	3,047
May 31	2,776
June 28	3,166
July 26	3,660
Aug. 30	3,976
Sept. 27	4,059
Oct. 25	4,322
Nov. 29	4,206
Dec. 27	4,241
1968:	
Jan. 31	4,259
Feb. 28	4,530
Mar. 27	4,920
Apr. 24	5,020
May 29	5,888
June 26	6,241
July 31	6,183
Aug. 28	7,025
Sept. 25 [2]	7,131
Oct. 30	7,080
Nov. 27	7,273
Dec. 25	6,976
1969:	
Jan. 29	8,725
Feb. 26	8,947
Mar. 26	9,743
Apr. 30	9,617
May 28	10,041
June 25	13,609
July 23	14,522

[1] Break in series occurred with December 28 figures of 4,050 and 4,036.
[2] Break in series occurred with September 18 figures of 7,599 and 7,610.

Source: Board of Governors, Federal Reserve System. The data shown in this table cover gross liabilies of U.S. banks to their branches in foreign countries. After December 1966 the data exclude military facility branches, but include certain overdrafts for the first time. The data are not directly comparable to the weekly series on assets and liabilities of large banks, primarily because the latter liabilities to foreign branches (included in "other liabilities") are on a net rather than gross basis. These data also differ from the monthly data on liquid liabilities to foreigners because they include certain liabilities that are classified as long-term or official in the monthly series.

The attractiveness of the EURO-dollar market as a source of funds for U.S. banks was enhanced by the fact that borrowings from foreign branches were not subject to reserve requirements or assessments for deposit insurance. In addition, checks in the process of collection which were issued in connection with Euro-dollar transactions could be deducted from gross demand deposits for reserve computation purposes. Taking these savings into account, and depending upon the mixture of simultaneous sales and borrowings and the day of the week, U.S. banks might pay up to 250 basis points more for deposits taken from their overseas branches than for domestic time deposits. An individual bank in the United States could thus increase its reserves by borrowing from an overseas branch. The reserves that one bank gained, of course, were lost by another. Therefore, such EURO-dollar borrowings did not increase the level of reserves for the banking system as a whole. But required reserves fell. Hence, the level of excess, and, therefore, free reserves, was increased by this means.[24]

[24] Given member bank borrowings from the Federal Reserve System. That is, free reserves equal excess reserves minus member bank borrowings from the Fed. Excess reserves equal actual reserves minus required reserves. The cost of Euro-dollar borrowings was, of course, increased with the institution of marginal reserve requirements against net liabilities to foreign branches. The change in regulations also required that checks issued by or on behalf of a foreign branch against its account with the home office be included in gross demand deposits as is the case with ordinary official checks. *Cf.* "Euro-dollar Float," *U.S. Banking Developments*, Chemical Bank, August 11, 1969. (See texts of amendments to Regulations D and M, *Federal Reserve Bulletin*, pp. 656–657, August 1969.) U.S. bank demand for Euro-dollars, however, appears to be quite inelastic. (*Cf.*, *e.g.*, "Trends in the Euro-dollar Market," *Continental Comment*, Continental Illinois National Bank and Trust Company, November 7, 1969; and "Euro Money Market Tight Again," *Monthly Economic Letter*, Frankfurter Bank, December, 1969.)

The 1966 experience was repeated during the latter part of 1968 and the first half of 1969. (See tables 3 and 4.) On November 27, 1968, outstanding CD's amounted to $24,307 million. By June 25, 1969, this total had fallen to $15,270 million. During the same period, U.S. bank liabilities to their foreign branches nearly doubled, going from $7,273 million to $13,609 million.

Almost synonomous with the new role of the EURO-dollar market in U.S. banking operations has been the role of the city of London. This achievement has been realized in spite of one of the most severe straitjackets—via United Kingdom exchange controls—ever to be imposed upon a free market. But the City flourishes in the entrepôt role.

Table 5 depicts the role of London in the EURO-dollar market. In 1965, United Kingdom banks accounted for 47 percent of the total external liabilities in U.S. dollars incurred by the reporting European banks. By 1968, the United Kingdom share had grown to 57 percent.

TABLE 5.—ROLE OF LONDON IN THE EURO-DOLLAR MARKET

[Yearend figures for external liabilities denominated in U.S. dollars]

	Reporting European banks [1] £ millions	United Kingdom banks		United States banks in the United Kingdom	
		£ millions	Percent of reporting banks	£ millions	Percent of United Kingdom banks
1965	4,107	[2] 1,879	47	849	44
1968	11,196	[3] 6,408	57	[4] 3,766	59

[1] Source: Bank for International Settlements, 39th annual report, Apr. 1, 1968, to Mar. 31, 1969 (Basle, June 9, 1969), p. 143. The 8 European countries which report to the BIS are Belgium, Luxembourg, France, Germany, Italy, Netherlands, Sweden, Switzerland, and the United Kingdom.

[2] Bank of England, Quarterly Bulletin, vol. VI, No. 1 March 1966), table 84, p. 19.

[3] Bank of England, Quarterly Bulletin, vol. 9, No. 1 (March 1969), table 19, p. 110.

[4] Bank of England, Quarterly Bulletin, vol. 9, No. 1 (March 1969), table 10, p. 96. Figures are for currencies other than sterling.

Prominent in the city of London are the branches of U.S. commercial banks. In 1965, they accounted for 44 percent of the United Kingdom banks' external liabilities in currencies other than sterling, mainly U.S. dollars. (See table 5.) In 1968, the U.S. bank share had expanded to 59 percent.

The question of the importance of U.S. banks in the city may also be considered the other way around, namely, the importance of the city to the U.S. banks. Table 6 shows the assets and liabilities of the overseas branches of Federal Reserve member banks.[25] There it may be seen that the largest percentage expansion during 1968 in overseas branch assets occurred in the United Kingdom, with the number of United Kingdom branches increasing from 25 to 35.

[25] Member banks account for more than four-fifths of total commercial bank assets in the United States.

TABLE 6.—ASSETS AND LIABILITIES OF OVERSEAS BRANCHES OF MEMBER BANKS OF THE FEDERAL RESERVE SYSTEM

[Yearend figures in millions of U.S. dollars]

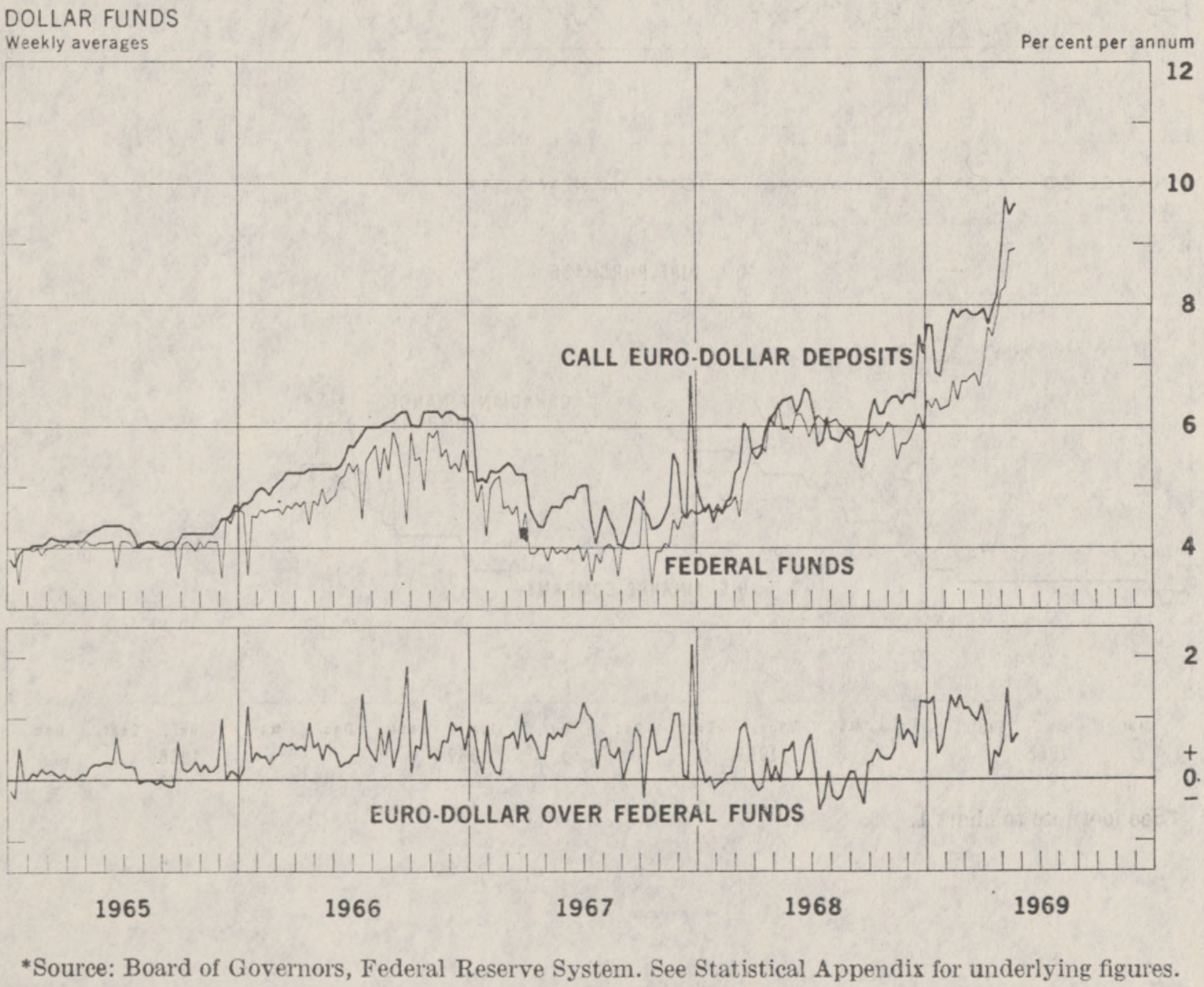
Items	England and Ireland		Continental Europe		Latin America		Far East		U.S. overseas areas and trust territories		Other		Total	
	1967	1968	1967	1968	1967	1968	1967	1968	1967	1968	1967	1968	1967	1968
Number of branches	25	35	46	34	133	178	63	72	31	35	9	9	295	375
Assets:														
Cash	1,543	2,201	638	441	212	251	137	150	43	42	21	53	2,397	3,335
Loans	3,155	4,933	1,416	1,120	591	880	1,047	1,308	500	551	137	137	6,551	9,225
Due from head offices and U.S. branches	2,712	4,291	923	359	119	97	422	418	411	411	21	7	4,045	6,147
Other	768	1,752	1,144	801	348	508	660	787	11	33	78	87	2,665	4,311
Total	8,178	13,177	4,121	2,721	1,270	1,736	2,267	2,663	965	1,037	257	284	15,658	23,018
Liabilities:														
Deposits:														
Demand	838	1,343	623	569	511	570	439	513	245	294	103	100	2,705	3,443
Time	6,534	10,501	2,283	1,454	372	638	777	839	492	505	138	166	9,767	14,932
Due to head offices and U.S. branches	32	64	105	28	53	152	209	193	213	223	1	1	536	738
Other	774	1,269	1,110	669	334	376	842	1,118	15	15	16	17	2,650	3,905
Total	8,178	13,177	4,121	2,721	1,270	1,736	2,267	2,663	965	1,037	257	284	15,658	23,018

Source: Board of Governors, Federal Reserve System.

IV. The Integration of National Money Markets Through the Market for Euro-dollars

The Euro-dollar market is an international money market—an international market for dollar-denominated obligations at short term. Confidence in the continued freedom of short-term capital movements and the fixity of exchange rates, plus the availability of efficient forward exchange markets, have greatly reduced fears of losses on the part of short-term investors and permitted the expansion of the Euro-dollar market. The existence of such an international money market should provide a communications link between national markets. This link should be forged by the international flow of short-term capital. Its effect would be manifested in the sympathy of movement of national money market rates of interest. The purpose of this section is to examine the evidence which might point to the existence of such an international linkage provided especially by the Euro-dollar market. The evidence is presented in charts 1–7.

Chart 1*



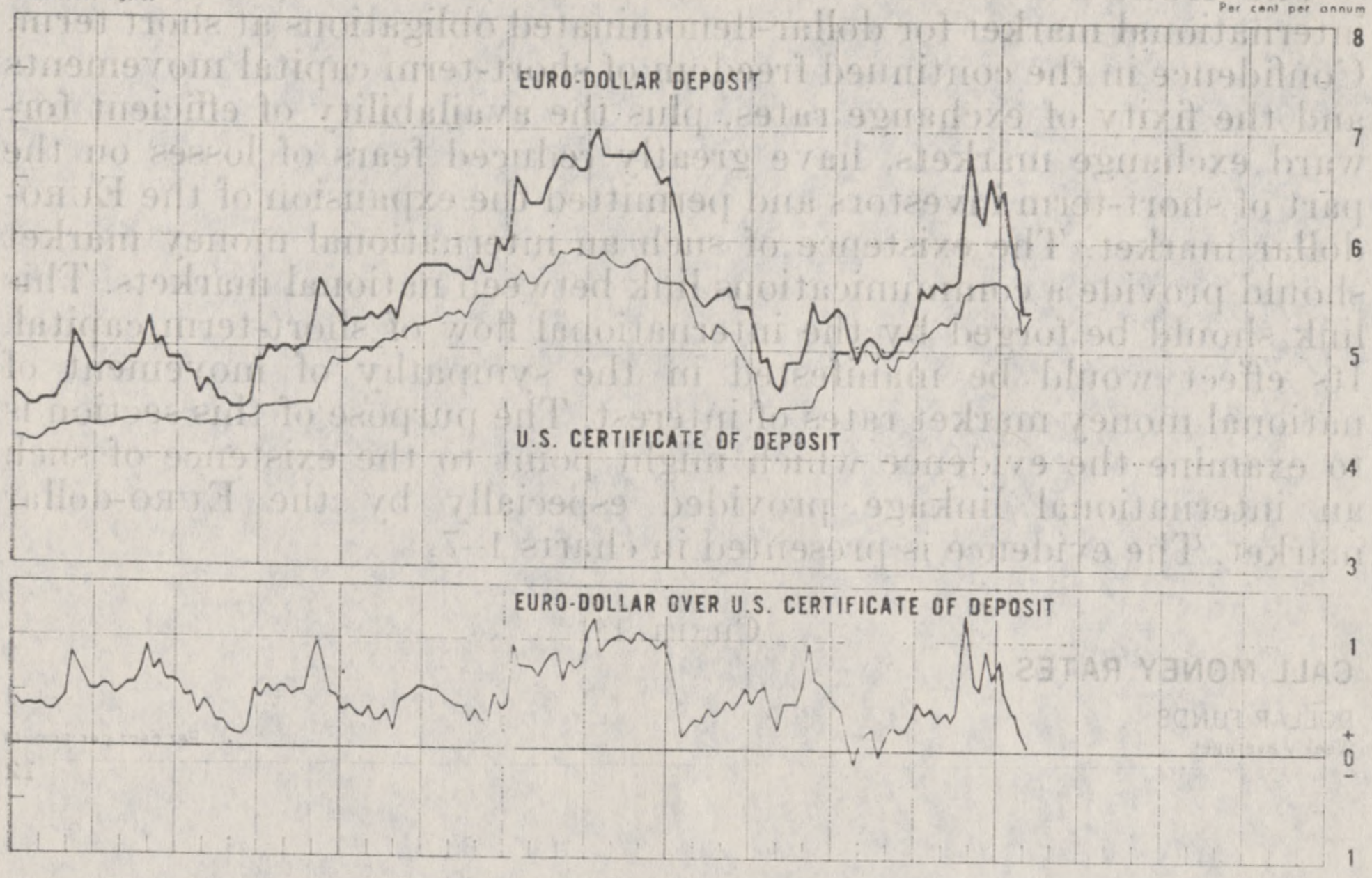
*Source: Board of Governors, Federal Reserve System. See Statistical Appendix for underlying figures.

Chart 2*

NEW YORK, LONDON, MONTREAL:
YIELDS FOR U.S. DOLLAR INVESTORS ON 3-MONTH FUNDS

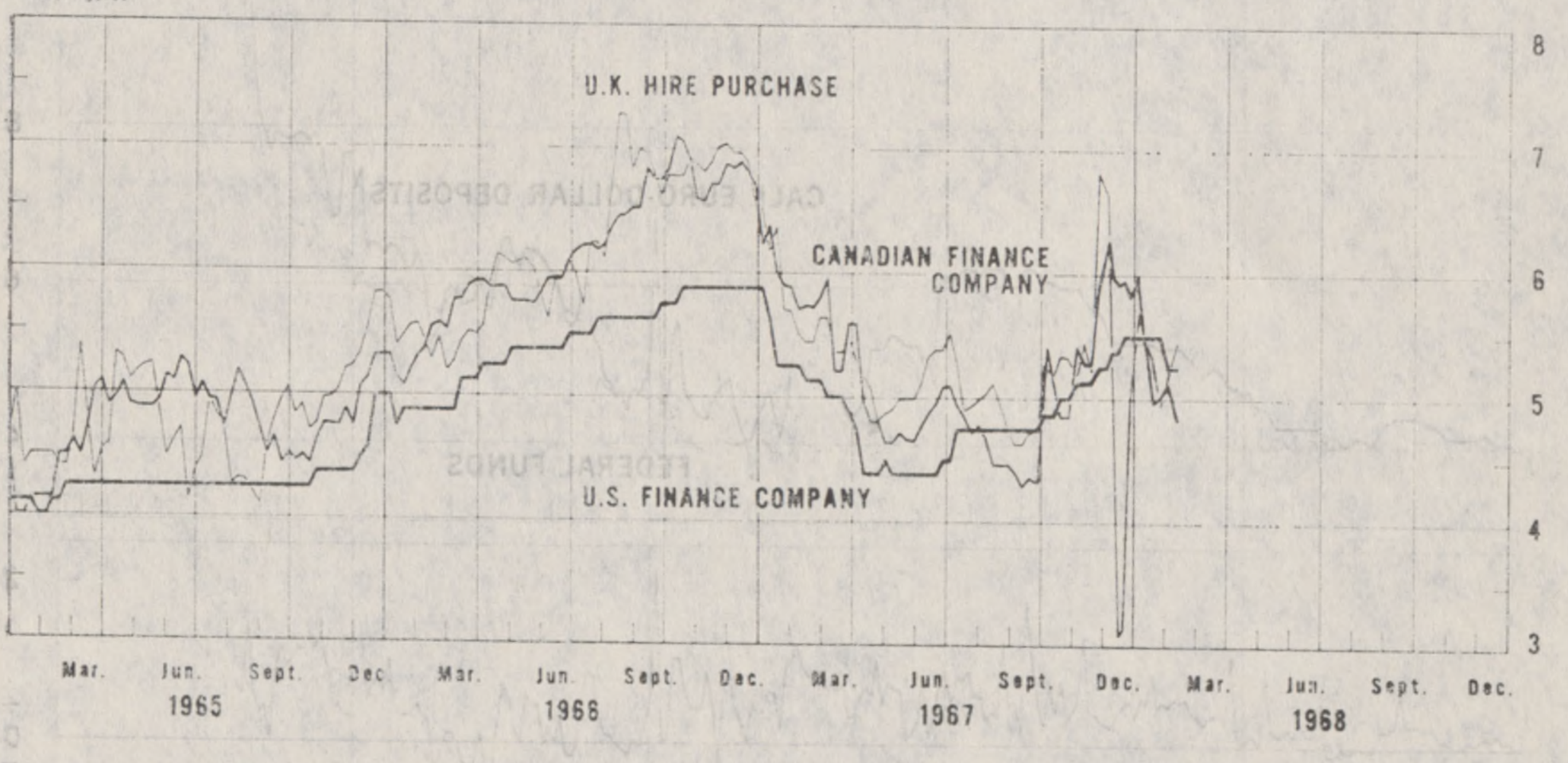
DOLLAR DEPOSIT RATES: NEW YORK-LONDON

Wednesday figures



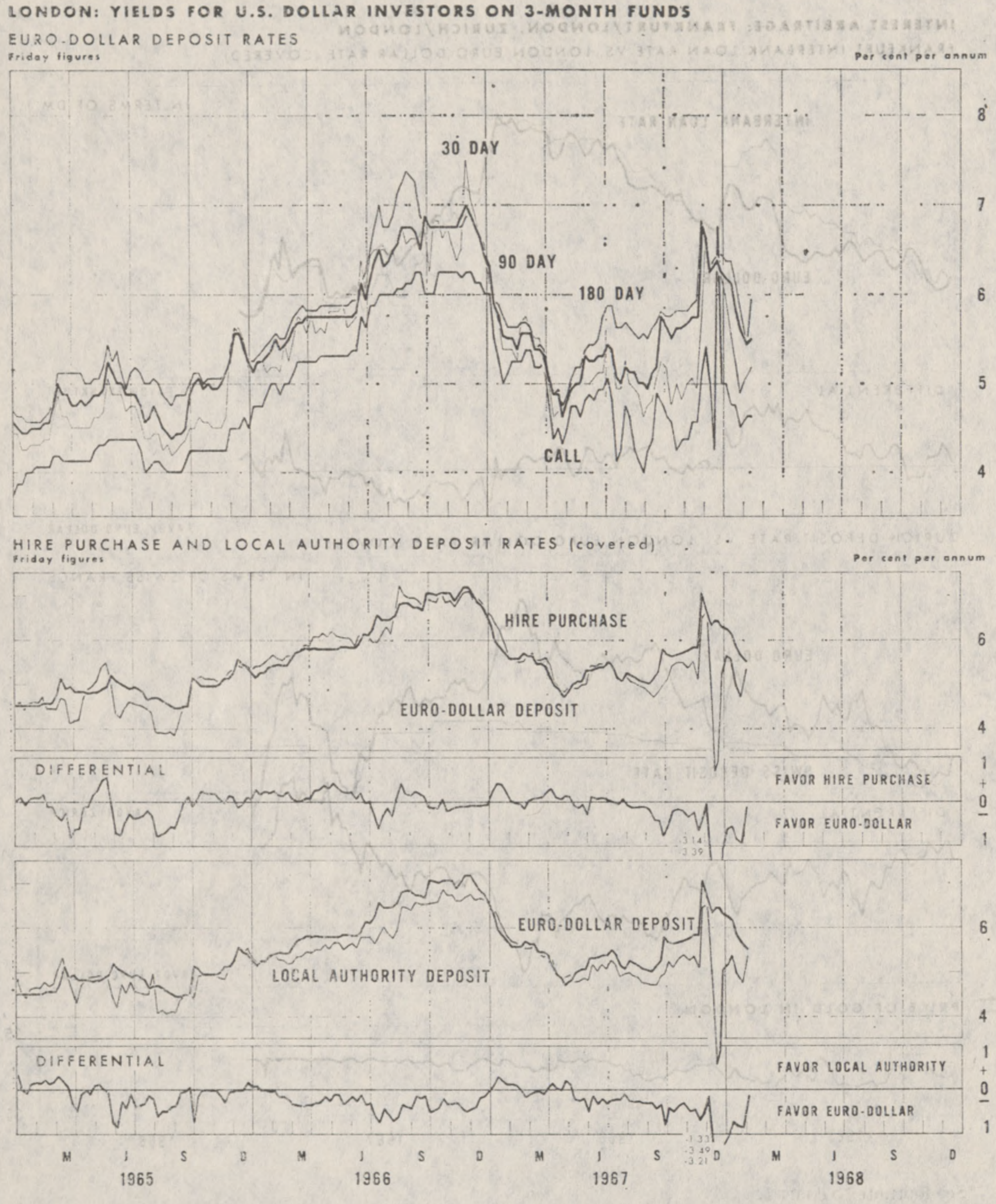
FINANCE CO. PAPER RATES (covered) QUOTED IN NEW YORK

Friday figures



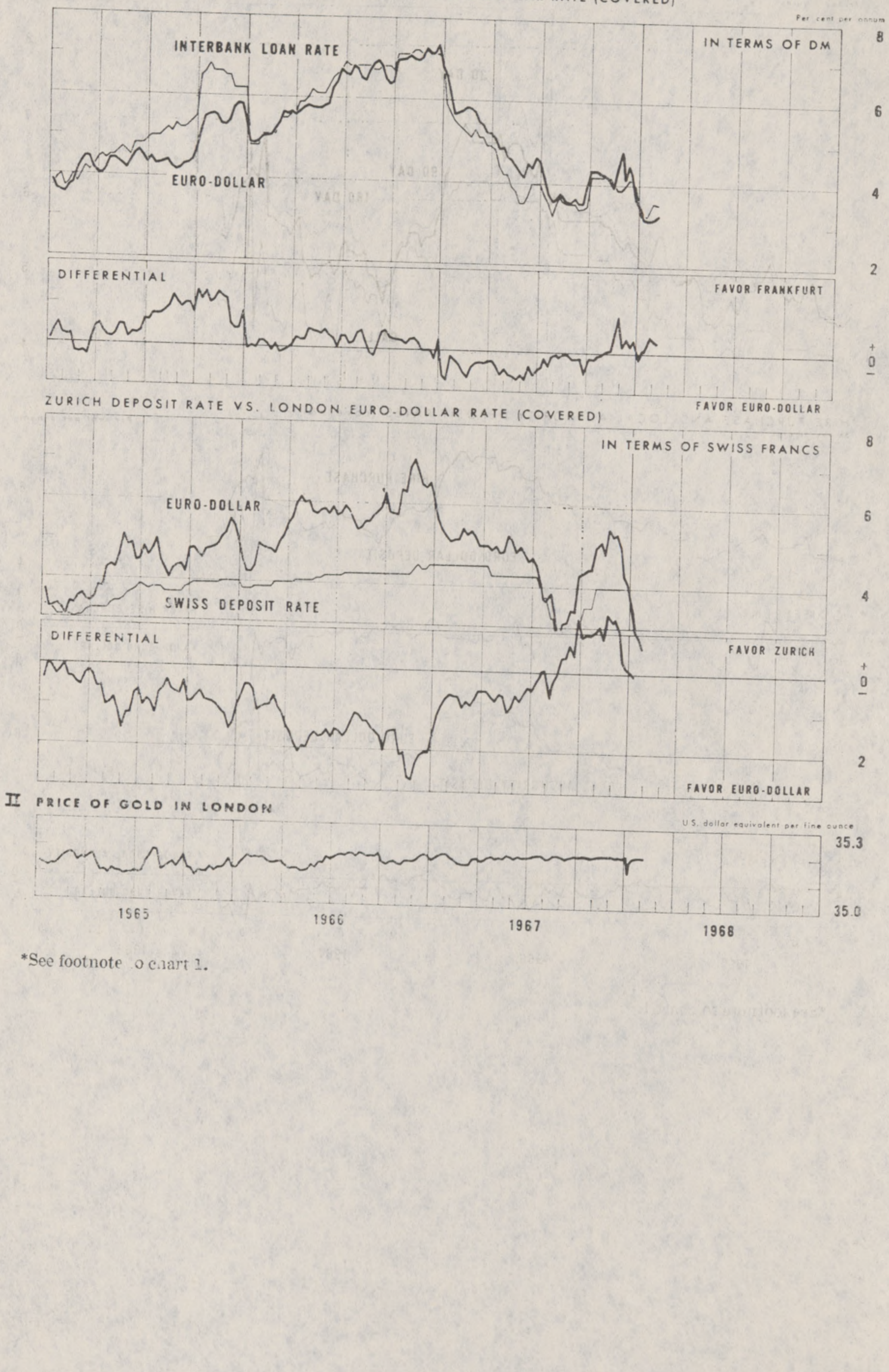
*See footnote to chart 1.

Chart 3*



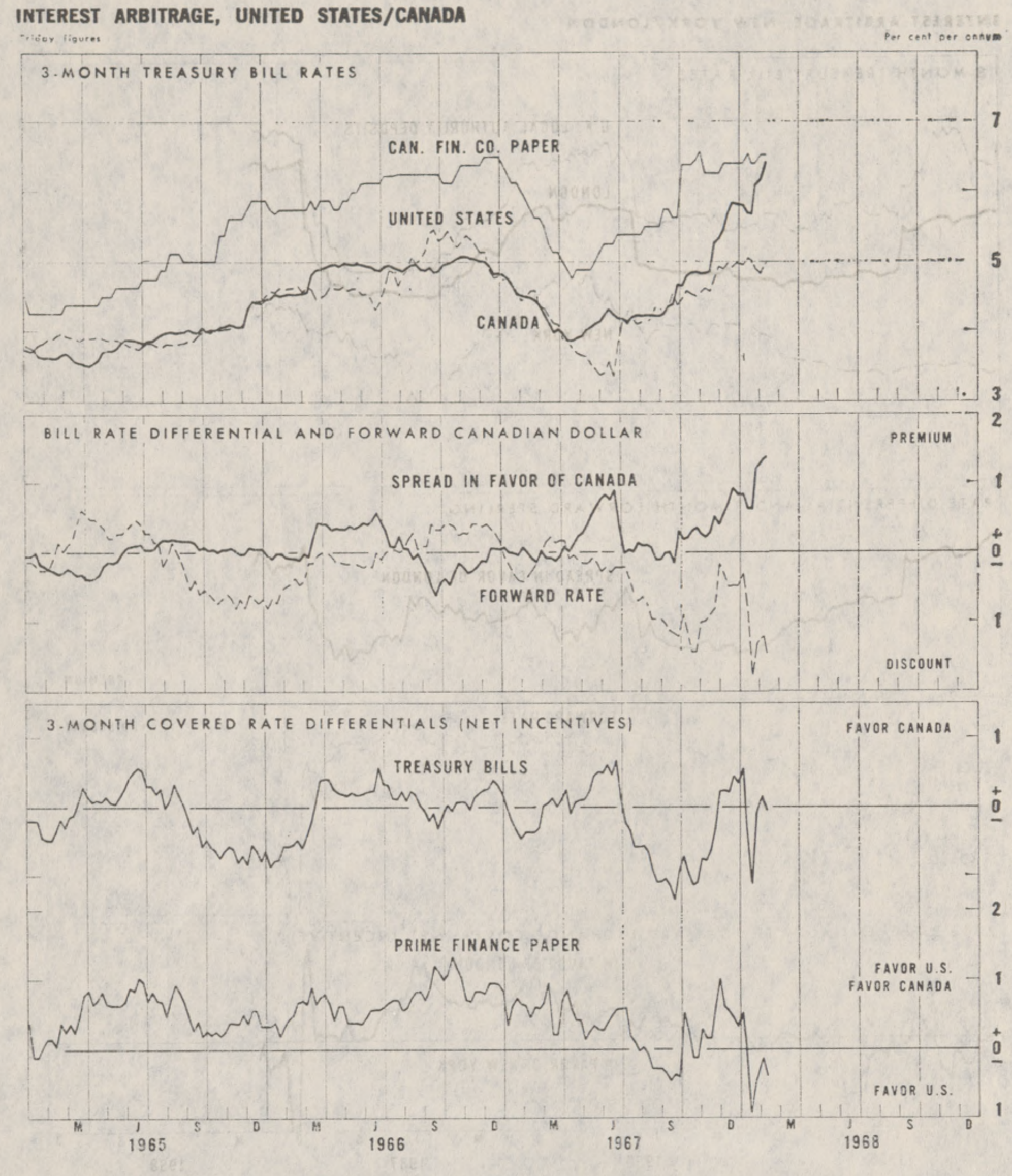
*See footnote to chart 1.

Chart 4*



*See footnote to chart 1.

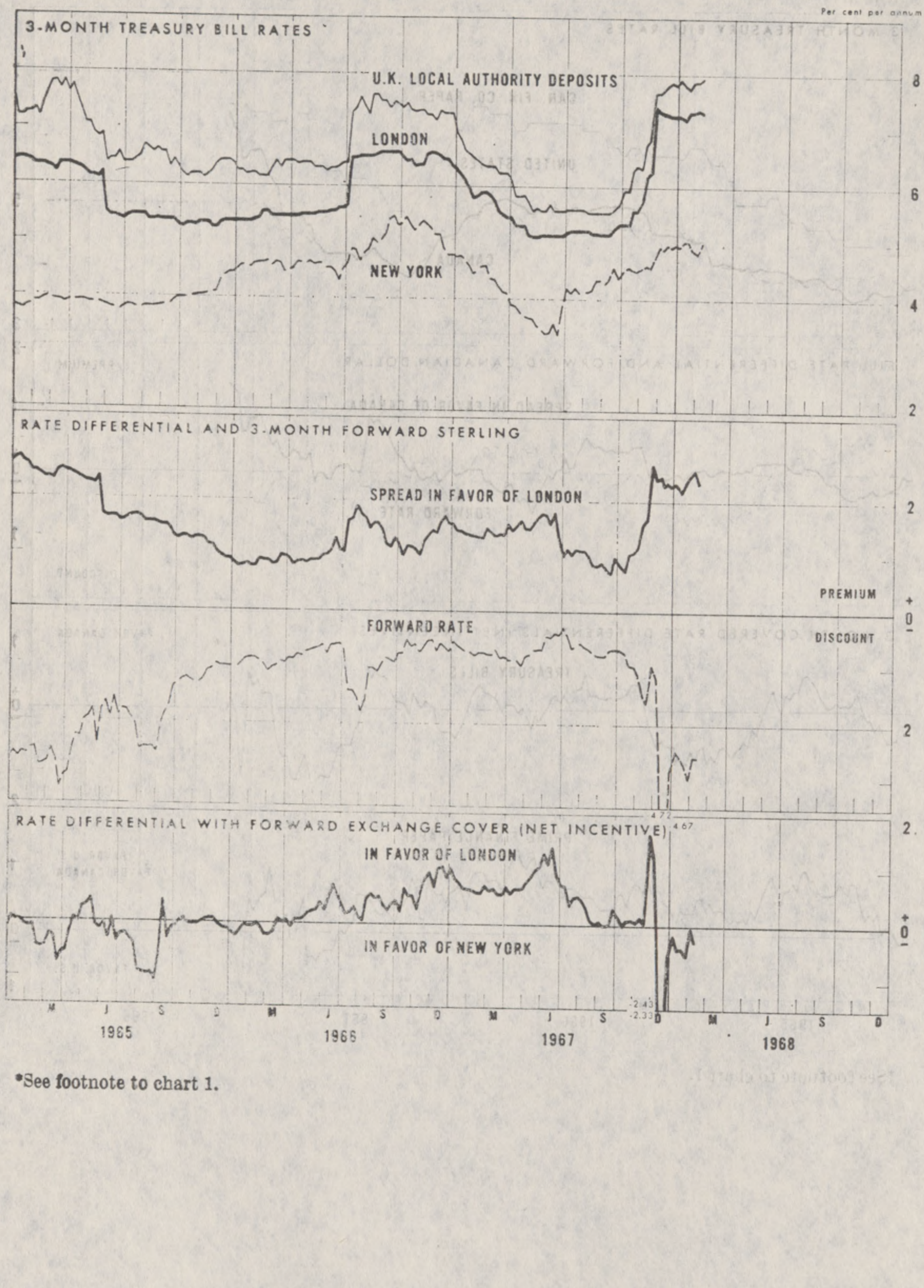
CHART 5*



*See footnote to chart 1.

CHART 6*

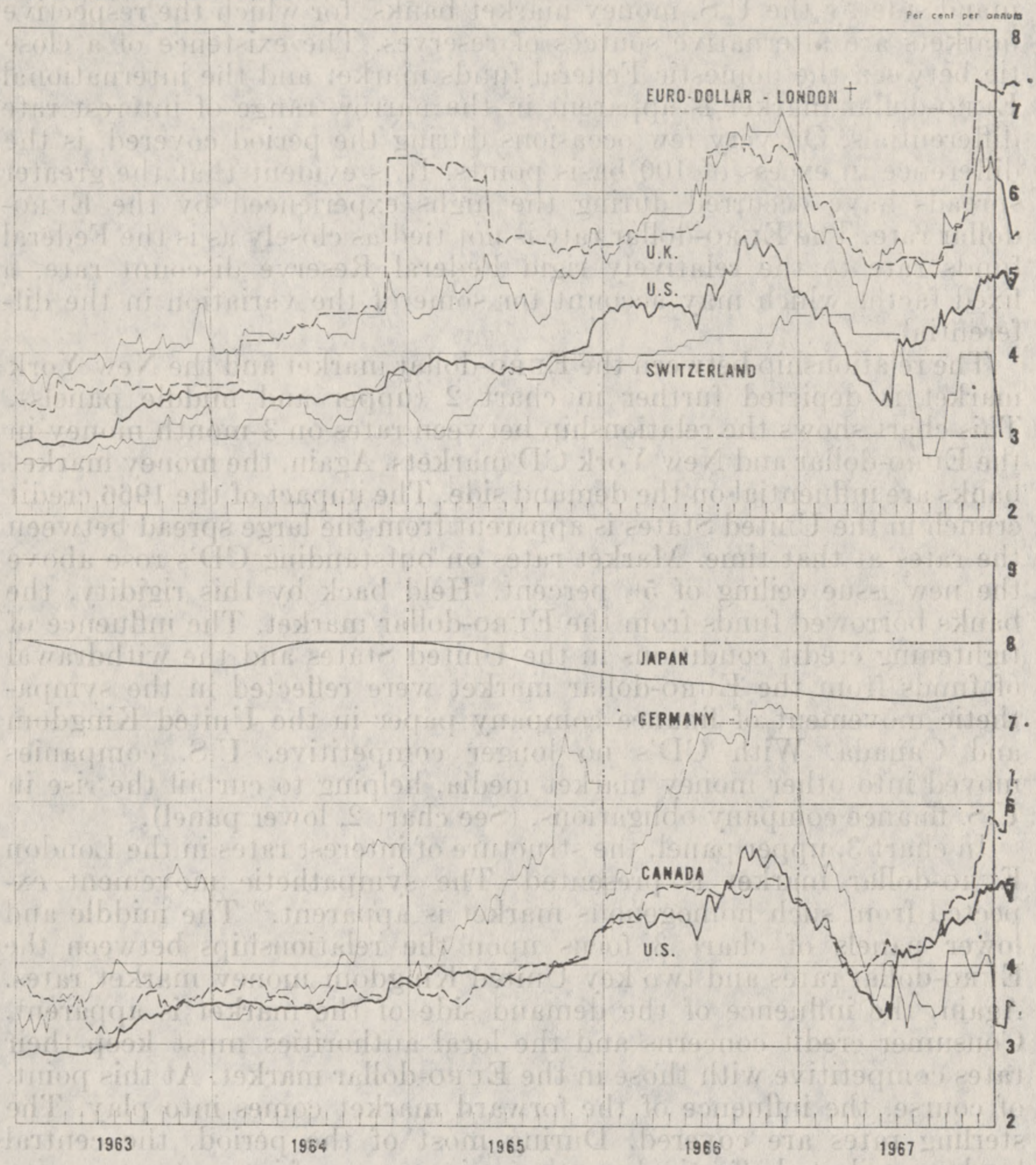
INTEREST ARBITRAGE, NEW YORK/LONDON



*See footnote to chart 1.

CHART 7*

SHORT-TERM INTEREST RATES**



*See footnote to chart 1.

**3-month treasury bill rates for all countries except Japan (average rate on bank loans and discounts), Switzerland (3-month deposit rate), and Germany (Interbank Loan Rate).

†3-month rate for U.S. dollar deposits in London.

In chart 1, there are presented interest rates on EURO-dollar call money and Federal funds. These rates are both affected on the demand side by the U.S. money market banks, for which the respective markets are alternative sources of reserves. The existence of a close tie between the domestic Federal funds market and the international EURO-dollar market is apparent in the narrow range of interest rate differentials. On very few occasions during the period covered, is the difference in excess of 100 basis points. It is evident that the greater spreads have occurred during the highs experienced by the EURO-dollar rate. The EURO-dollar rate is not tied as closely as is the Federal funds rate to the relatively rigid Federal Reserve discount rate, a fixed factor which may account for some of the variation in the differential.

The relationship between the EURO-dollar market and the New York market is depicted further in chart 2 (upper and middle panels). This chart shows the relationship between rates on 3-month money in the EURO-dollar and New York CD markets. Again, the money market banks are influential on the demand side. The impact of the 1966 credit crunch in the United States is apparent from the large spread between the rates at that time. Market rates on outstanding CD's rose above the new issue ceiling of 5½ percent. Held back by this rigidity, the banks borrowed funds from the EURO-dollar market. The influence of tightening credit conditions in the United States and the withdrawal of funds from the EURO-dollar market were reflected in the sympathetic movement of finance company paper in the United Kingdom and Canada. With CD's no longer competitive, U.S. companies moved into other money market media, helping to curtail the rise in U.S. finance company obligations. (See chart 2, lower panel).

In chart 3, upper panel, the structure of interest rates in the London EURO-dollar market is presented. The sympathetic movement expected from such homogenous market is apparent.[26] The middle and lower panels of chart 3 focus upon the relationships between the EURO-dollar rates and two key United Kingdom money market rates. Again, the influence of the demand side of the market is apparent. Consumer credit concerns and the local authorities must keep their rates competitive with those in the EURO-dollar market. At this point, of course, the influence of the forward market comes into play. The sterling rates are covered. During most of the period, the central bank contributed effectively to the maintenance of interest-rate parity through operations in the forward exchange market. During the troubled times of late 1967, however, this was not the case.

The four panels of chart 4 relate covered EURO-dollar rates to domestic rates of interest in Germany and Switzerland. Generally sympathetic movements are discernible. However, neither country possesses a money market which is comparable in resiliency to those in London and New York. Moreover, both countries have employed various selective measures to impede the inflow, or promote the outflow, of short-term capital.[27] The effect of these devices is especially apparent in the case of Zurich.

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[26] There is also some evidence that short-term rates tend to be relatively high when rates are high generally. This pattern characteristic is consistent with the expectations theory of the term structure.

[27] Cf. the concluding section of this paper for an enumeration of such techniques.

Chart 5 depicts the close relationships which exist between money market rates in Canada and the United States, while chart 6 presents similar comparisons for the United States and the United Kingdom. Clearly, there is not a full adjustment in the forward exchange markets to the interest rate differentials. However, the impact of market forces plus official intervention account for the relatively narrow range of net investment incentive.

Finally, in chart 7, the raw interest rates of the countries considered, along with Japan, are shown. The periodic explosions in the United Kingdom rate mark attacks on the pound and the desperate attempts of the United Kingdom authorities to mount an effective defense. The mirror-like reflection of United Kingdom and United States rates often displayed by the Swiss rate tells the story of Switzerland as a haven for flight capital. The Japanese pattern reflects heavily administered rates. The remarkable seasonality which dominates the German rate, reflects, to an important extent, the premium attached to year-end window-dressing by the German banks.[28] But, given the lack of fluidity in a number of markets and the existence of various control policies, the sympathy of movement that does remain is impressive. And, much of the responsibility for this pattern, it would seem, may be attributed to the EURO-dollar market.

The previous discussion has centered on the hypothesis that the EURO-dollar market has provided a communications link between national money markets. To test this hypothesis further, the behavior over time of differentials between money market rates of interest in seven countries and the United States, as reported by the International Monetary Fund, have been examined. The 3-month Treasury bill rate was used for Canada, the Netherlands, the United Kingdom, and the United States. Call money rates were employed in the case of Belgium, France, Germany, and Switzerland. The test results are presented in table 7. There it will be seen that the period 1948–68, has been divided on the basis of the general return to currency convertibility in 1958.

TABLE 7.—DIFFERENTIALS BETWEEN MONEY MARKET RATES OF INTEREST IN THE UNITED STATES AND 7 COUNTRIES[1]

	1948–58		1959–68	
	Coefficient of trend (percent)	Correlation coefficient	Coefficient of trend (percent)	Correlation coefficient
Belgium	−4.3	0.881	−1.0	0.521
Canada	11.6	.841	−1.4	.871
United Kingdom	21.2	.786	−2.0	.740
Netherlands	1.0	.753	5.3	.926
Germany	[2] −28.9	[2] .188	−5.1	.290
Switzerland	[2] −1.5	[2] .843	2.5	.728
France	([3])	([3])	−4.0	.916

[1] These statistics were computed by my colleague, Lawrence Chimerine, whose assistance is gratefully acknowledged.
[2] Computed for 1950–58 only.
[3] Data not available.

The coefficients of trend were derived by regressing the percentage differential between the money market rate for each of the seven coun-

[28] Based on correspondence with Franz Scholl. See also "Recent Trends in Short and Medium-Term Interbank Relations Classified by Banking Groups," *Monthly Report of the Deutsche Bundesbank*, Vol. 19, No. 12 (December 1967).

tries and the United States. The rate for the United States was subtracted from that of the other country, and the difference was divided by the United States rate. Thus, for example, the —4.3 percent coefficient of trend for Belgium means that during the period, 1948–58, the Belgian rate less the United States rate, as a percentage of the United States rate, declined by an average of 4.3 percent a year.

In general, if the level of interest rates in a foreign country is above that in the United States and the differential decreases, the trend coefficient will be negative. If the differential increases, the coefficient of trend will be positive. On the other hand, the level of interest rates in the foreign country may be below that of the United States. In this case, if the differential increases, the trend coefficient will be negative. If the differential decreases, the coefficient of trend will be positive.

The correlation coefficients represent simple correlations between the rates of each country and the United States during the indicated time periods.

The development of the EURO-dollar market was, to say the least, facilitated by the moves toward currency convertibility in 1958. Consequently, the impact of the EURO-dollar market as a link between national money markets should have been greater during the 1959–68 period. The test results are in part consistent, and in part inconsistent, with the thesis that the EURO-dollar market provided such a national money market link.

Five of the seven trend coefficients estimated for the second period are negative. This result is consistent with the hypothesis being tested. Moreover, the two countries with positive trends were the Netherlands and Switzerland, two countries which have generally experienced lower interest rate levels than the United States.

In the five countries with negative trends, only Belgium has recorded rates usually lower than those of the United States. In this instance, the case of Belgium, the empirical result fails to support the theory being advanced. The empirical validation of the theory also is subject to qualification because the results lack statistical significance.[29] In about one-half of the cases, the trend coefficients for the 1959–68 period are not significantly different from zero. Those for France and the Netherlands are clearly significant. Those for Germany and Switzerland are of marginal significance. The statistics for the remaining countries are not significantly different from zero.

With regard to differential behavior for the two periods, the results are also mixed. The United Kingdom pattern is a consistent one, since United Kingdom-United States differential tended to widen during the earlier,[30] and narrow during the later, period.[31] The Swiss case is also consistent. Swiss money rates have usually been below those in the United States; and differentials widened during the former,[32] and narrowed during the latter, period.[33] The Canadian result also tends to favor the hypothesis. For the other countries, however, the theory fails the test.

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[29] This statement is based upon the 0.05 level of significance. That is, given the number of observations, the correlations were so low that they could have occurred more than 5 times in 100 samples drawn from an uncorrelated population. The inference is drawn, therefore, that there is little, if any, correlation.

[30] Becoming more positive.

[31] Becoming less positive.

[32] Becoming more negative.

[33] Becoming less negative. In other words, since Swiss rates were less than those in the United States, a narrowing of the differential would reduce the negative difference.

Finally, correlation coefficients may be compared for the two periods. For only three countries were the correlation coefficients higher in the postconvertibility period. For the other three[34] countries, correlations with the U.S. rates were greater during the preconvertibility period. This result may seem inconsistent with the basic hypothesis, since better linkage supposedly results in higher correlation. On the other hand, a lower correlation may have been a necessary concomitant of a negative trend differential in a case where the level of foreign interest rates was higher than the U.S. level. That is, it would have been necessary for foreign and U.S. rates to move in opposite directions in some years to reduce the differential, a rate pattern that would also reduce the correlation. It follows that the comparison of correlation coefficients is not a wholly satisfactory test.

A fundamental difficulty confronts any attempt to measure the influence exerted by the Euro-dollar market upon international interest rate differentials. This difficulty arises from the theory of interest rate parity, according to which national interest rates *corrected for foreign exchange risk* will tend toward equality. In other words, *covered* interest rates will tend toward equality. Inasmuch as forward exchange markets are subject to speculative movements and central bank intervention, the extent to which uncovered rates of interest will reflect the impact of international money flows may be limited. Hence, it was not unexpected to find that the econometrics produce less than fully satisfactory results. Indeed, it is surprising that the results were as good as they were.

V. The Euro-Dollar Market and the U.S. Balance of Payments

1. THE EFFECT OF THE EURO-DOLLAR MARKET UPON THE U.S. BALANCE OF PAYMENTS

Since balance-of-payments equilibrium is an important policy objective, any consideration of U.S. policy vis-a-vis the Euro-dollar market must take into account the effects of the market upon the U.S. balance of payments. An attempt to assess these effects will be made next.

Initially, the market probably induced an outflow of funds. During the market's formative years, rates of return on investment and interest rate levels were higher in most countries of Western Europe than in the United States. Most European countries did not have money markets which facilitated international capital movements. The development of the Euro-dollar market provided an outlet for short-term funds that responded to the higher rates of interest outside the United States but did not involve the illiquidity of poorly structured money markets, such as those found in many foreign countries.

Once established, however, the market absorbed funds that might otherwise have fallen into official hands. As official holdings rise, some foreign central banks are increasingly subject to political pressures at home to convert all but a working balance into gold. However, the amount of dollar balances which fall into the hands of official institutions may be reduced in a number of ways and for a variety of reasons:

[34] French data were not available for the earlier period.

(*a*) U.S. commercial banks may borrow EURO-dollars through foreign branches and other foreign banks to help satisfy legal reserve requirements.

(*b*) Foreign banks may acquire EURO-dollars and relend them in the New York money market. Klopstock has estimated that outstanding foreign agency and branch securities' loans in New York have been in the $700 million to $1 billion range in recent years.[35]

(*c*) Foreign banks have borrowed EURO-dollars and reloaned them at long term, as well as short term, to companies in the United States. Klopstock has estimated that about $500 million, of such loans were outstanding at year-end 1967.[36]

(*d*) Foreign banks with branches and agencies in New York have employed EURO-dollars as operating funds rather than drawing upon their U.S. correspondents.

(*e*) To some, though minor, extent, foreign banks have added to their working balances with U.S. banks to compensate the latter for clearing services.

(*f*) Though the need for contingency reserves is a modest one foreign banks do hold some balances in the United States for this purpose.

(*g*) Foreign banks and the foreign branches of U.S. banks borrow in the EURO-dollar market and relend to European and other foreign companies and the European and other foreign affiliates of American companies, thus reducing their own and their customers' demand for bank loans in the United States.

(*h*) Foreign monetary authorities may conduct dollar swap operations with their commercial banks which bring downward pressures on the EURO-dollar rate structure through interest rate subsidies and increases in supply. Such interest rate effects will tend to increase private holdings in the United States and thus reduce the level of official dollar balances.

Taking all of these factors into account, Klopstock has estimated that foreign private dollar holdings in the United States would be about $3.5 billion less than their present level were it not for the existence of the EURO-dollar market.[37] In other words, if the EURO-dollar market had not existed, these dollars might have found their way into official hands and thus affected adversely the U.S. balance balance of payments on an official settlements basis.

With regard to the impact of the market upon the balance of payments on a liquidity basis, there is a certain asymmetry in the effect of inflows and outflows. When, for example, a U.S. company transfers dollars from an account with a U.S. bank to an Italian bank, the deficit on a liquidity basis increases. The deficit on this basis is not affected if the Italian bank redeposits the funds with the London branch of another U.S. bank. Nor is it reduced when the London branch relends the dollars to its head office in New York.[38]

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[35] See Klopstock, op. cit.
[36] See ibid.
[37] See ibid. Also see Fred H. Klopstock, "Impact of Euromarkets on the United States Balance of Payments," *Law and Contemporary Problems*, vol. 34, No. 1 (winter, 1969), pp. 157–171.
[38] The balance of payments on the official settlements basis is not changed by any of these transactions.

2. THE EFFECT OF THE U.S. BALANCE OF PAYMENTS UPON THE EURO-DOLLAR MARKET

Since the policies designed to bring the U.S. balance of payments into equilibrium have an impact upon European money and capital markets, their specific impact upon the EURO-dollar market should also be considered. All would agree, presumably, that the supply of dollars to foreigners through past deficits in the U.S. balance of payments has made an important contribution to the development and growth of the EURO-dollar market.[39] These deficits have led to a sharp rise in U.S. banks' liabilities to nonresidents, including foreign central banks, commercial banks, nonfinancial corporations, and individuals. Whether U.S. balance of payments equilibrium would lead to the drying up of the market is, however, problematical.

The answer to the latter question depends upon the structure of the U.S. balance of payments as it reaches equilibrium. Suppose, for example, that there is a Vietnamese peace settlement combined with an increase in the current-account surplus. Suppose further that these favorable developments result in the elimination of all direct controls over capital movements. In these circumstances, and given relatively high interest rates in the EURO-dollar market, it is quite possible that the market would flourish.

Even with a continuation of direct controls over capital movements, a number of factors point to the viability of the market. The absorptive capacity of the market compares favorably with the narrow money markets found in most countries. Foreign banks and corporations have few alternative outlets to the EURO-dollar market. And, in fact, a large proportion of placements in the EURO-dollar market are made by investors who acquire the necessary dollars in the foreign exchange market.[40] Finally, American banks and companies would continue to utilize this recently developed and expanded source of funds.

It must be concluded, therefore, that equilibrium in the U.S. balance of payments would not necessarily cause a contraction in—let alone destroy—the EURO-dollar market. It would most likely remain in substantially its present form and size. Consequently, many of the policy implications of its existence would remain.

VI. POLICY IMPLICATIONS OF THE EURO-DOLLAR MARKET

1. THE CHALLENGE TO MONETARY POLICY

The existence of the EURO-dollar market has greatly complicated the environment in which central banks operate. The market has had a direct impact upon the level of interest rates and the availability of credit in individual countries. Domestic banks may, for example, accept dollar deposits from the market, convert the proceeds of these deposits into the local currency, and make local currency loans to domestic borrowers. Foreign banks may obtain funds from the EURO-dollar market and make foreign or local currency loans to domestic companies. Domestic banks and corporations may liquidate existing

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[39] It is true, of course, that the reverse would have been the case had U.S. deficits substantially dimmed the long term prospects for the dollar.

[40] Foreign investors could, of course, simply place these dollars in the United States. However, placing the dollars in Europe has a certain, if illusory, appeal to many foreign lenders.

placements in the EURO-dollar market in much the same way as they would liquidate short-term investments in order to provide funds for expansion.

As has been noted in some detail earlier, commercial banks in the United States have, from time to time, relied heavily upon the EURO-dollar market as a source of funds. The acquisition of such funds by domestic banks may tend to offset the effect of a restrictive monetary policy. Similarly, in periods of expansionary monetary policy, domestic banks and companies may absorb liquidity through the placement of funds in the EURO-dollar market. Such placements counteract or offset the effort of the central bank to expand liquidity at home. Thus, the EURO-dollar market has added another dimension to the problem of domestic monetary management.[41]

2. USE OF DIRECT CONTROLS

Central banks in a number of countries have employed various direct controls to prevent banks and nonfinancial corporations from pursuing policies that are inconsistent with central bank objectives. Such policies, of course, have to some extent been employed or are being employed in the United States. Others might be adapted for use in the United States. Some of the individual controls which may or are being used are as follows:

(*a*) EURO-dollar or foreign-currency loans by domestic companies may be prohibited outright, subjected to licensing arrangements, or rationed administratively according to the type of borrower to be accommodated.

(*b*) Various kinds and degrees of restrictions may be placed upon corporate borrowings from foreign banks.

(*c*) The placement of dollars in the EURO-dollar market by domestic banks or companies may be prohibited or subjected to quotas.

(*d*) Restrictions may be placed upon the conversion of EURO-dollars into local currencies or an outright prohibition may be enforced. Such conversions may also be subjected to control through adjustments in the terms of swap arrangements with domestic banks.

(*e*) Domestic banks may be prohibited from incurring net liabilities in a foreign currency. Such a prohibition prevents the bank from holding domestic currency loans as assets behind EURO-dollar liabilities.

These and other types of regulations and exchange controls have been employed in a number of countries—notably the United Kingdom and Italy—and have undoubtedly hindered to some extent the growth of the EURO-dollar market. In the United States, present day restrictions upon foreign lending by banking and other financial institutions

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[41] Given free international capital movements, similar problems would arise even without the existence of a EURO-dollar market. Holders of EURO-dollar deposits would have the alternative of holding direct claims on the United States if the EURO-dollar market did not exist. Domestic banks would borrow money from abroad—payable either in their own, the lender's, or a third currency—in order to cushion the effect of a restrictive monetary policy. Thus, the problems posed by the EURO-dollar market differ only in degree—not in kind—from those presented by the liberalization of international capital movements. That there is a difference in degree is accounted for by institutional factors such as the key currency role of the dollar, the relative liquidity of EURO-dollar investments, and the network of foreign branches of U.S. commercial banks.

and direct controls on EURO-dollar placements by American companies are examples of the kinds of direct controls that may be used to prevent international capital flows which are facilitated by the existence of the EURO-dollar market. These measures have been taken in this country in an effort to reduce the balance of payments deficit. However, the same measures also affect the environment in which domestic monetary policy operates.[42]

3. IMPLICATIONS FOR EXTERNAL POLICY

(a) Balance-of-payments effects

The balance-of-payments effects of the EURO-dollar market are not easily assessed. However, the existence of the market may well attract foreign dollar holders. Consequently, they may place dollars in the market rather than converting them immediately into local currencies. As has been seen in the earlier description of the market mechanism, the dollars may eventually be converted and fall into the hands of a central bank.

Nevertheless, the postponement in time of the fact of conversion does result in the temporary absorption of U.S. dollars by a foreign market. Hence, the balance-of-payments effect on an official settlements basis is favorable, and the threat to the U.S. gold stock is lessened. Otherwise, general shifts of funds into and out of the United States are determined largely by expected rates of return.[43] Relatively low interest rates in America may induce a general exodus, relatively high rates of return a reverse flow.

(b) The market and speculation in gold or foreign currencies

During attacks on the dollar, low-margin financing requirements for gold purchases have been met by EURO-dollar credit. The collateral is high grade. It is not surprising, therefore, to find EURO-dollars seeking such an outlet. As in the case of the Deutsche Mark, the EURO-dollar market has also been used as a vehicle for speculating in a foreign currency. The basic problem has many ramifications. A direct approach, which has already been implemented to an important extent, calls for the imposition of high margin requirements by national monetary authorities upon this specific kind of lending activity.

(c) The market and the pound sterling

Monetary management on an international scale is affected by movements into EURO-dollars from weak currencies. Such movements, under the present regime of international surveillance and mutual support, add still another dimension to monetary management. Thus, the 1966 credit crunch in the United States resulted in the conversion of sterling investments into EURO-dollars, which were then called home by U.S. banks. The Federal Reserve, in turn, was asked to lend to the Bank of England. This cycle, to some degree at least, meant that the Federal Reserve was replacing, through the London circuit, the same dollars it was destroying through open market policy at home. The existence of such a cycle does not neces-

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[42] Congressman Reuss has called upon the Federal Reserve System to issue guidelines for a voluntary freeze on bank credit. See the *New York Times*, June 20, 1969.

[43] These include allowances for risks of various kinds including the risk of devaluation.

sarily completely vitiate domestic monetary policy. Policy impacts may be effective in a dynamic process, even though they would be fully neutralized should a long-term static equilibrium ever come into being.

In any event, the existence of such a phenomenon is hardly more than a present-day symptom of the closer ties between national capital markets. The earlier discussion with regard to the related problem of monetary management at the domestic level has a bearing in the present context.

(*d*) *The use of direct controls*

The widespread impact of the EURO-dollar market as a communications link between national capital markets could be effectively eliminated through the reinstitution of a thorough-going system of exchange controls. As is patently clear from the historical record, the elimination of exchange controls on most short term capital movements was a basic ingredient in the inception and refinement of the EURO-dollar system. Their reinstitution could do much to destroy the institutional fabric of the market. The international position of the dollar and the benefits to be gained through the liberalization of international capital movements must, on the other hand, be weighed in the balance.

(*e*) *The use of indirect policies*

The effective employment of a high interest rate policy—combined, if necessary, with an expansionary fiscal policy—would do much to temper the need for direct controls on capital movements. Unilateral transfers, foreign aid, and military outlays must be considered. The question of the parity relationships of the dollar is pertinent. Nevertheless, the problem of capital flows, itself, could be handled largely by a rational administration of the policy mix. Moreover, if the indirect policy approach were successfully implemented as far as the balance of payments is concerned, more rapid progress might be made in the area of international monetary reform, and longer run pressures in the gold market [44] might be relieved.

4. THE POLICY MIX AND THE FLEXIBILITY OF FISCAL POLICY

The key to further progress—perhaps, at this juncture, even the maintenance of the status quo—consists of the flexible administration of the policy mix. And the key ingredient in a flexible policy mix is flexible fiscal policy.[45] In the absence of fiscal policy flexibility and given the view that the use of direct controls to regulate international capital movements is a lesser evil than employing them to achieve domestic economic objectives, monetary policy is burdened with domestic stabilization goals while controls direct over capital movements are used to assure balance-of-payments equilibrium. Flexibility

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[44] In terms of dollars.

[45] This statement should not be construed as implying that if fiscal policy is flexible, monetary policy may thereby be flexible. Quite the contrary, it is precisely the condition of fiscal policy flexibility that permits the flexible use of monetary policy as an instrument of external equilibrium.

Cf. Ira O. Scott, Jr., *European Capital Markets*, Office of the Comptroller of the Currency, Washington, D.C., 1968, ch. 10.

of the fiscal instrument would, therefore, provide a necessary condition for the liberalization of capital movements.[46]

Even with fiscal policy flexibility, central bankers may fear the loss of control over the level of domestic interest rates. Interest rate policy at home will necessarily reflect, or be influenced by, monetary policies abroad, as a central bank protects its country's external position. Finance ministers may be equally apprehensive if a restrictive monetary policy, dictated by high interest rates in foreign money and capital markets, makes politically costly inroads into the mortgage market and housing industry. Nevertheless, if fiscal policies in different countries were generally flexible, central bankers would be free to concentrate upon the external position. They might, in turn, through cooperative efforts and effective coordination, be able to keep interest rates at a relatively low level. Such a policy, generally adhered to, would obviate the necessity for defensive monetary actions on as grand a scale as would be required in the absence of such cooperation and coordination. Moreover, such policies of international cooperation oriented toward coordinated efforts to keep interest rates relatively low would relieve pressures on the mortgage market and construction industry.

Relatively low interest rates would also be conducive to higher rates of growth, thus, compensating to some extent for the unfavorable effect on growth of restrictive fiscal policies pursued during periods of strong inflationary pressures at home. Indeed, greater flexibility of the fiscal instrument and coordination of national monetary policies would reduce the need for some forms of cooperation, such as the use of swap arrangements,[47] which sometimes complicate the problem of domestic monetary management. The Federal Reserve has, for example, done swaps with the Bank of England to buoy up the pound. It has entered into similar arrangements with the BIS to cool the Euro-dollar market and thus decrease its attractiveness to international investors. But, the existence of such arrangements is symptomatic of a need for a greater degree of flexibility at the domestic policy level. Greater flexibility at that level would thus decrease the importance of flexibility in international relationships.

Fiscal flexibility is, nevertheless, not a sufficient condition for the elimination of the need for direct controls on capital movements. The spatial distribution of rates of return may be such that, in spite of the coordination of monetary policies, private capital may be exported rather than flow into domestic uses which have been given high social priorities. In this event, the avoidance of direct controls may depend upon the willingness of the governments involved to adopt other selective devices, such as tax incentives, subsidies, and the like, to assure the achievement of domestic resource allocation objectives.[48] Only

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[46] As Katz has put it in his study of E.E.C. central banking:
". . . the European central banks sought primarily to attain domestic economic goals, even when such policies conflicted with the requirements of international balance. As a result, we find general tendencies, both in Europe and outside, toward the use of direct controls to check international flows of capital . . ."
See Samuel I. Katz, *External Surpluses, Capital Flows, and Credit Policy in the European Economic Community, 1958 to 1967*, Princeton Studies in International Finance, No. 22 (1969), p. 44.

[47] Cf. "Central Bank Swaps—A Bulwark of International Monetary Cooperation," *Federal Reserve Bank of Atlanta Monthly Review* (December 1967).

[48] Cf. Francesco Forte and Ira O. Scott, Jr., "The Use of Selective Taxes as a Means of Achieving Balance of Payments Equilibrium," *National Banking Review*, Vol. 3, No. 4 (June 1966), pp. 439–447.

then can a rather heavy reliance upon direct controls in the area of international capital movements be circumvented.[49]

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[49] The "bard of economics" expresses his view of the matter as follows:

In cents and dollars, pounds and pence,
There is a Liquid Turbulence,
And large financial integration
Leads to excessive speculation,
Whereas in Marks and Francs and Lire,
The market's smaller, trade is dearer,
So European Gnomes or Elves
Expend their savings on themselves—
Though people now are growing fond
Of Eurodollar and Eurobond
For Love of Money Finds a Way
When Greeks and Arabs come with pay.

If capital is free to flow,
The State may find itself in tow
(Humiliating Circumstance!)
Behind the Tug of High Finance.
With many hands on many tillers,
And ten Charybdises and Scyllas,
And strong Propensities for Wrecks,
The wonder is we save our necks,
And yet the politicians shudder
To think of one hand on one rudder,
Because nobody can agree
On whose the guiding hand should be.
So Integration, all can see,
Is Good—for everyone but me.

Do flexible exchange rates spell
Descent into some kind of hell?
No, when exchange is Freed, man rises
To high Miltonian Paradises,
Where Trade is obviously meant
To substitute for Government,
And the whole Universe is planned
By heaven's non-existent hand.

This "verse" has been quoted from Kenneth E. Boulding, "The Ditchley Bank Anthology," *Michigan Business Review*, Vol. XXI, No. 2 (March 1969), p. 17.

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