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THE EURODOLLAR MARKET AND THE U.S. BALANCE OF PAYMENTS

by

Louis Charles Woolums

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in the Department of Economics in the Graduate College of The University of Iowa

August 1969

Thesis supervisor: Professor George S. Peck

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CERTIFICATE OF APPROVAL

MASTER'S THESIS

This is to certify that the Master's Thesis of

Louis Charles Woolums

with a major in Economics has been approved by
the Examining Committee as satisfactory for the
Master of Arts degree at the convocation of
August 1969.

Thesis committee: _____
Thesis supervisor ,

Member

Member

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CHAPTER I

INTRODUCTION

During the last decade, Eurocurrency markets have grown very large, and important changes in financial practices have transpired. Contemporaneously, the international monetary system has undergone severe strains which have at times threatened to collapse the system. Only strenuous efforts on the part of the monetary authorities have prevented such an occurrence.

Even though an international monetary disaster has so far been averted, there is little room for complacency in dealing with problems which tend to stress the system beyond limits of resiliency. Additionally, the precarious condition of the system generates the belief that new financial practices should be carefully studied to determine just how the system is being affected by such practices.

Since the United States has considerable interest in maintaining international monetary stability, and the Eurodollar market is so large, it is almost necessary to inquire as to what, if any, effect the Eurodollar market has on the balance of payments position of the United States. Although a few writers have discussed the foregoing question, by no means has the subject been exhausted analytically. The rigorous analytical substance, however, which is so often taken for granted in economic science, is generally absent in existing

literature. With such a new area of study, practically every writing contributes something in furthering the understanding of the Eurodollar market, and depreciation of earlier writings is not intended here.

Few economists interested in the Eurodollar market would deny, in any event, that considerable work remains to be done and from the vantage point of this writer, it appears that the unpublished research of Aryeh Blumberg¹ may be the beginning of extensive analytical work on the Eurodollar market-balance of payments question.

Returning to the problem of a Eurodollar market effect on the United States balance of payments, it would seem to be a relatively simple procedure to investigate and determine if any effects can be found. The procedure would perhaps be simple if one is satisfied with the loose definitions of the Eurodollar market. The writer now realizes, however, that the principal difficulty with most of the literature is the lack of a sufficiently rigorous definition of the Eurodollar market, as well as the lack of a macroview of activity within the market. What is meant by the "balance of payments" for the United States, and what the monetary authorities perhaps see as the basic problem within the international monetary system, given certain policy objectives, present similar problems of definition.

The subject matter of this paper is divided into five chapters with the definition of the United States balance of payments and the rationale for that definition presented in Chapter II. Since the

¹Aryeh Blumberg, private meeting held at Vanderbilt University, Nashville, Tennessee, June, 1968.

Eurodollar market is relatively new among financial institutions, a very brief discussion of the origin and history of the market is presented in Chapter III. The Blumberg analysis and some empirical support for that analysis are presented in Chapter IV.

In Chapter V, the Eurodollar market and the balance of payments are brought together and discussed from an analytical and logical point of view. Further work in the examination of this topic is suggested and some directions for the additional work are described.

CHAPTER II

THE BALANCE OF PAYMENTS OF THE UNITED STATES

The balance of payments accounts represent a record of most economic transactions which cross national boundaries during a certain time period. These accounts are a monetary record of monetary and real transfers, so questions involved would seem to revolve around those activities which appear in the balance of payments accounts. Does Eurodollar market activity have any effect on them?

Before continuing, a useful and frequently used term requires definition. A currency widely used to transfer value, to store value and as a unit of account between non-residents of the country of origin of that money is defined to be a vehicle currency.¹ That the United States dollar fits this definition is fairly obvious, but it is only one aspect of the role of the dollar as a vehicle currency which is discussed in this paper, that is, Eurodollar operations.

A question is posed in the introductory paragraph, but would an answer, an explicit accounting answer serve to further clarify our understanding of whether the Eurodollar market affects the balance of payments? That is, would an answer framed in the preceding manner be useful? The fundamental point was given indirectly in the

¹Swoboda, Alexander K., "The Eurodollar Market: An Interpretation," Essays in International Finance, No. 64, February 1968, Princeton University, p. 15.

Introduction: The threat of international monetary instability, as manifested in devaluation, revaluation or the collapse of a currency, is the reason for discussing this topic.

If the problem of international monetary stability is most easily characterized by exchange rates, then what would be the purpose of analyzing balance of payments accounts? As long as economic activity can proceed largely unimpeded, it really matters very little how individual accounts are affected. In one sense, then, the topic of this paper should perhaps have been the dollar exchange rate and the Eurodollar market. In the more practical sense, however, "balance of payments" has an aura which necessitates formulating the question as it is. In this manner the reader will realize, hopefully, that the balance of payments accounts, per se, are largely irrelevant for our purposes here. Few officials are concerned with what goods are imported or exported (ignoring strategic considerations), but many people are concerned with the international value of the United States dollar.

Even though floating exchange rates are still the topic of many discussions, it is obvious that those in power, whether in the official establishment or in the business world, wish to retain an international monetary system which employs fixed exchange rates. The developments over the last ten years, however, seem to point to continuing difficulties in maintaining the system essentially as it now is, including the fixed exchange rates. The United States will likely continue to be a net exporter of investment capital. In the past, of course, a large trade surplus did much to offset the net outflow

of capital, but in 1968 even the trade accounts were in deficit for a short period. Furthermore, a foreign war continued to demand unusual spending abroad for which there is neither automatic adjustment nor compensating exports.

Assuming that fixed exchange rates are desirable and are to be continued, does the Eurodollar market make the job of maintaining parities easier, more difficult or have no influence either way? The monetary aspect of the balance of payments is the concern here and not real changes which may occur due to the existence of a Eurodollar market. That is to say that even though the Eurodollar Market is clearly a monetary phenomenon, the production and flow of goods and services are undoubtedly influenced by the existence of a Eurodollar market, but the real effects in themselves are not the topic of this paper. What is meant by an equilibrium balance of payments, then, is that the exchange rate of the United States Dollar remains at the set rate without official intervention. Under this condition, the United States Treasury would have to sell very little, if any, gold from official reserves.²

The more conventional definition of international economic equilibrium for the United States is that equilibrium prevails when net exports (or imports) of short-term claims is zero, i.e., the country is neither in surplus nor deficit. As a matter of practice, however, few countries seriously object to a relatively small net import of short-term claims. Such an equilibrium as just described,

²The absence of depreciating or appreciating pressures on the dollar. Swoboda, p. 22.

however, is not consistent with a dynamic and growing world economy. Since many Western countries are either net importers or exporters of capital and the prospects of a radical change are very small, it is debatable whether the conventional equilibrium is even desirable.

Implied in this working definition, that is, a stable exchange rate, are some points worth noting. The United States can continuously be in deficit on official accounts, but as long as the exchange rate is stable, equilibrium prevails. In this sense, international equilibrium can result when all countries concerned maintain constant relative growth rates. The rate of inflation or deflation of the economies involved would also have to be constant relative to each other. Thus, as long as each country's real growth rate, coupled with its rate of inflation, occupies a constant percentage of the total economy under consideration, stable exchange rates would prevail, ceterus paribus.³ It is nearly inconceivable to this writer to imagine that constant relative growth rates could, however, come about without the various monetary authorities, et al., pursuing policies designed to bring about such an objective. Such policies could of course be construed to be a kind of official intervention, but the objective of these policies is so much wider than exchange rate stability, as such, that we need not be concerned about this aspect.

³ Provided that none of the economies involved suffers from adverse income elasticities of demand for exports versus imports; furthermore, foreign exchange reserves, relative to the volume of trade would have to grow at the same rate as economic expansion.

Assuming that the dollar⁴ continues to be the major vehicle currency, such a condition would demand an increasing volume of dollar liquidity which the United States could easily supply.⁵ As long as the demand for dollars grows at approximately the same rate as the supply, the exchange rate would be stable.

Implicit in this line of reasoning is the assumption that foreigners do not lose confidence in the dollar. A snowballing speculative attack on the dollar would not be likely to occur without a precipitating political event of one sort or another; but if one develops, the Western monetary authorities have numerous weapons with which to meet such an attack. Their most powerful weapon, however, is the desire to maintain the present system through cooperation in using swaps, lines of credit and temporary restrictions.

An argument often used to justify the American deficits holds that the United States is acting as a world central bank. Because their money is used as the major vehicle currency,⁶ Americans profit in several ways. The volume of foreign exchange transactions of Americans is minimal and the total costs of converting are, therefore, small. On the other hand, virtually all foreign users of dollars must convert

⁴"Dollar" will always refer to the United States dollar in this paper.

⁵Costantino, Anthony, "International Monetary Economics," Lecture Notes, The University of Iowa, Spring Semester, 1968.

⁶Swoboda, p. 11.

into their domestic currency sooner or later. Furthermore, American residents suffer little from exchange-rate uncertainty, inasmuch as they do not need to convert as often. The United States commercial banking system gains in that a higher level of profits results from the use of the dollar as a vehicle currency.⁷ Since foreign commercial banks are now loaning Eurodollars, however, the additional gains accruing to the United States banks are somewhat diminished.

⁷Ibid., p. 14.

CHAPTER III

BACKGROUND ON THE EURODOLLAR MARKET

The Eurodollar market has been the subject of much discussion and writing in the last five years, and some material of a casual nature is available. This chapter is an attempt to very briefly acquaint the reader with some history of the market and why it developed.

For purposes of this discussion, Eurodollars are short-term liabilities of the United States commercial banking system which are borrowed and lent, at least initially, by foreign financial institutions and individuals. The practice of international traders borrowing currencies other than their own is not a new phenomenon, but the one feature of the Eurodollar market that sets it apart from other periods of international finance is the magnitude of the market.¹

Some of the specific practices of the market had been going on for at least six years before the market reached significant proportions. Technically, Communist-bloc banks were the first dealers in the Eurodollar market. In 1953 the Moscow Narodny Bank of London, the Banque des Pays de l'Europe du Nord, of Paris, the State Bank of

¹As of December 1966, Eurodollar liabilities were estimated to be around \$15,080 millions. The Euro-Currency Market (annual report), Bank for International Settlements, Basle, Switzerland (June 12, 1967), 16.

the USSR and other Communist-country banks were net lenders of deposits denominated in United States dollars.

The motive of the Communist-bloc banks, in making the funds available to non-United States borrowers, was supposedly to pre-empt blockage of dollar deposits by the United States government in the event of additional political difficulties. At that time, East-West relations were particularly tense and the freezing of assets owned by the East in the United States was one type of political pressure which the United States could have used. Such a move was essentially pre-empted when these assets were transferred abroad. It is relatively simple for the Federal Reserve Board to order American banks to stop payment from any account and to cease processing any transfers under the name of a particular account.

Another reason for providing loanable dollar funds to European banks is somewhat stronger. By establishing a working relationship with banks in Britain and Continental Europe, the Eastern banks maneuvered into a position from which they could also borrow dollars. As it happened, the Communist banks became net borrowers of dollars from the British and European banks. Inasmuch as the rates on dollars were high in Europe, the profit motive undoubtedly also helped the Russians et al. to redeposit their dollar holdings outside the United States.

A vice president of the First National City Bank in New York, Lawrence Heath, believes that the Eurodollar market was born in the late fifties when the Midland Bank in London induced the Dresdner

Bank to withdraw a dollar deposit from Citibank in New York and place it with the Midland Bank. Citibank was paying $2\frac{1}{2}$ per cent, but Midland would pay 3 per cent for the deposit. Midland then loaned the money to Fiat Motor Company in Italy at $4\frac{1}{2}$ per cent.² A foreign bank had made a dollar loan to another foreign entity.

Prior to 1958, even though the United States had been in deficit for almost ten years, complaints were still being voiced about a dollar shortage in Europe. Simultaneously, however, some central banks were cashing in dollars for gold; the distribution of dollars abroad was obviously uneven. The international movements of short-term capital were effectively blocked by exchange controls and the latent foreign demand for dollars could not be expressed in the United States because to most European firms, American capital markets were inaccessible. Access to capital markets is principally a function of credit, and since very few European companies were well known in the United States, they have no credit rating. A credit rating in this sense is not like that provided by a rating service such as Dunn and Bradstreet, but rather involves an analysis of the company's balance sheet and, what is more, knowing the reputation of the accountants who audited the statement. Furthermore, commercial banks also are usually well acquainted with the managers of the borrowing company.

A great deal of foreign-owned dollars were kept in United States banks simply for convenience because foreign traders needed the dollars

²"Revolving Credit: Flexibility in Eurodollars," Business Abroad (February 6, 1967), pp. 19-22.

for transaction purposes; and since Federal Reserve regulations permitted only time deposits to be interest-bearing (and that rate was quite low relative to European rates) almost any other short-term investment would have been more profitable. With the establishment of essentially full convertibility, short-term capital flows increased substantially. Areas with a dollar shortage could now borrow from areas with a dollar surplus.

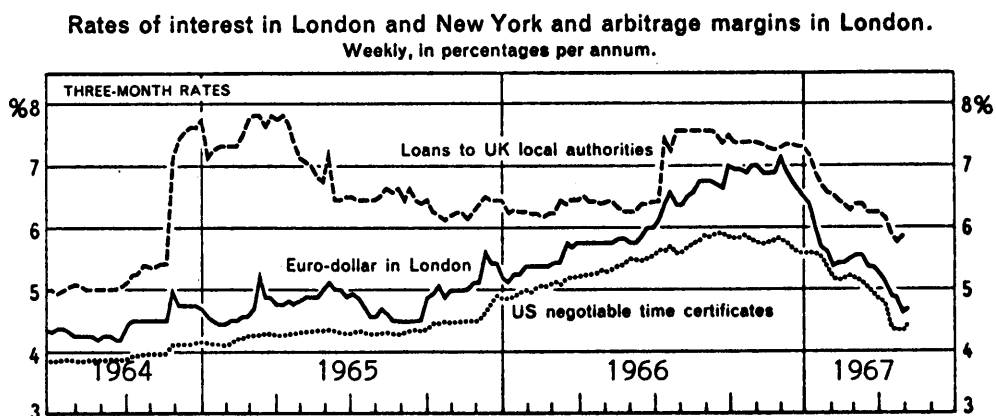
As the Eurodollar market increased in size, the foreign owner of dollar balances in the United States recognized an opportunity to earn more on his deposit because lenders could typically earn more on their dollars in the Eurodollar market than in the United States, and borrowers will typically pay lower rates on dollar-denominated loans abroad than they would have to pay on loans in their own currency. The interest rate on Eurodollars has practically always fallen between the maximum rate on a comparable financial instrument in the United States and the rate on domestic currencies in Western Europe. Furthermore, the rate on Eurodollars rarely varies by more than 3/4 of 1 per cent above the rate on United States negotiable time certificates.³ Because the rate on Eurodollars fluctuates with changes in seasons and policies, among other things,⁴ foreign central banks have been selectively placing their own dollars with foreign commercial banks in order to keep

³The Euro-Currency Market, Bank for International Settlements, p. 9.

⁴Credit tightening in the United States will cause an increase in the interest rate on Eurodollars, ceterus paribus.

the rate from rising higher than they believe desirable.⁵

FIGURE 1. RATES OF INTEREST IN LONDON AND NEW YORK WEEKLY, IN PERCENTAGES PER ANNUM*



*Eurocurrency Market, The Bank for International Settlements, June 12, 1967, p. 16.

In the early years of the Eurodollar market, both the borrowing and lending rates were subject to negotiation on an individual basis, but with passing time and an increasingly large market, Eurodollar operations have become more centralized. London is the center of Eurodollar market activity⁶ with rates being quoted daily on Eurodollars of various maturities. Rates on Eurodollars are published in The Economist. Eurodollar loans are generally for a million or more dollars with maturities ranging from call to one year, although the most common maturity is 90 days. Loans for longer than a year would

⁵The Euro-Currency Market, Bank for International Settlements, p. 8.

⁶W. Dennis Wright, private meeting held at The Continental Illinois National Bank and Trust Company of Chicago, Chicago, June 1968.

generally be obtained in the Eurobond market (dollar denominated bonds floated abroad).

The Eurodollar market came into existence as a result of many diverse pressures. Foreign financial institutions found that liquidity shortages could be alleviated during periods of tight money by using the Eurodollar market. These financial institutions also discovered that the Eurodollar market would

. . . permit greater latitude in foreign banking since dollar loans, as opposed to sterling or other local currency credits, were generally not subject to exchange control restrictions. In short, Eurodollar trading developed to offset restrictive monetary actions.

In Europe, it circumvented controls on foreign lending and measures designed to restrict domestic credit.⁷

The Eurodollar market is often related to the continuing balance of payments deficits of the United States. Before the advent of the Eurodollar market, foreigners who earned short-term dollar claims could keep them in the United States or convert them into their domestic currencies (in which case the foreign central bank might eventually acquire the claims). The Eurodollar market opened a third option: He could keep the dollars in the United States at a certain interest rate, or he could place them in the Eurodollar market at a slightly higher interest rate, or convert into his domestic currency.

Although the percentage of funds contributed by any one supplier is changing continually, by far the largest supply comes from foreign

⁷A. Robert Abboud, "The Significance of Eurodollars in Today's World Markets," Bankers Monthly Magazine (February, 1964), 30.

central banks (over 40% in 1966). International corporations, especially American, provide a considerable volume of funds to the market, as well as borrow large amounts; then there are the smaller firms which engage in international trade, individual holders of dollars--foreign and domestic--and foreign commercial banks, some of which have dealt in the market just to make contacts for future Eurodollar financial intermediation.⁸

The borrowers of Eurodollars are also a diverse group, and in some instances, they are also suppliers. Generally speaking, any individual or firm which has the necessary credit rating can get a Eurodollar loan. Borrowers of Eurodollars include such organizations as international firms, foreign domestic firms, commercial banks in the United States, some foreign central banks and Eastern European central banks.

Commercial banks borrow in the Eurodollar market to supplement their pool of loanable funds. Since there is, as yet, no reserve requirement on Eurodollars which are used as reserves, the entire amount may be loaned to a domestic borrower. At the Continental Illinois National Bank and Trust Company of Chicago, during the early part of April, 1969, Eurodollar takings were averaging approximately 900 million, of which 500 million were 90-day maturities and 400 million were daily maturities. Continental Bank uses the Eurodollar market as a fairly constant source, and the Federal Funds market is

⁸Paul Einzig, The Eurodollar System, Practice and Theory of International Interest Rates (New York: The Macmillan Company, 1964), 37.

generally used as a cushion to insure that the bank remains within legal reserve requirements.

Continental's London branch bids for the Eurodollar deposits from various foreign banks and upon successful bidding, the funds become available as soon as the branch can transfer them to Chicago. The branch owes these Eurodollars to the foreign bank but the home office has the use of the funds. The home office is free to re-lend the entire amount. The Eurodollar takings permit the bank to run a larger volume of loans without borrowing at the Federal Reserve bank.

The United States dollar occupies a most important position of being the major vehicle currency and is in demand through the world because many international traders find it convenient and profitable to deal almost exclusively in dollars. Other Euro-currencies are in use but they make up a pool that is only about 20 per cent the size of the Eurodollar pool.⁹ The immense relative size of the United States economy puts its currency in the position of being well suited (if any currency is well suited) to fulfilling the role of a vehicle currency. The volume of capital in the United States is quite large relative to that in the Eurodollar market and, therefore, the capital markets of the United States can absorb with relative ease the financial waves which are created by the international use of a domestic currency.

⁹Lawrence A. Mayer, "The World's Freest Money Market," Fortune, LXXVII, No. 4 (April, 1968), 114.

CHAPTER IV

THE BLUMBERG ANALYSIS

Introduction

The Blumberg analysis is used in this paper to define and explain the Eurodollar market within a logical framework. His Quasi-Gold Exchange Model with the Eurodollar Component is specified by way of "T" accounts of the various transactors in an abstract version,¹ and various relationships are defined, given the assumed behavior of the actors insofar as the kind of transactions is concerned. From the defined relationships, other relationships are deduced, some of which can be tested empirically. Section I defines the Eurodollar market operations (and therefore the Eurodollar market itself), and presents a discussion of some secondary transactions which result from activity on the part of individuals. In Section II Eurodollar market relationships are defined and discussed, and in Section III some empirical support for those relationships is presented.

Section I: The Nature of Eurodollars

What are Eurodollars? This question is perplexing if one does not have a frame of reference in which to structure an answer.

¹The model itself is not presented. Aryeh Blumberg, private meeting held at Vanderbilt University, Nashville, Tennessee, June 1968.

Fortunately, the work of Aryeh Blumberg provides the necessary schema, and it is from that viewpoint that the question is here considered. In the Blumberg model, there are four different operations which give Eurodollars their distinction and each is considered in turn.

First, however, a brief explanation of the schema is essential. Eurodollars will be defined by using "T" accounts to show the four reversible operations from which Eurodollars arise in a multinational, multi-denominational model. The actors in the model are the cosmopolitan public, the United States banking system and the foreign banking system. The cosmopolitan public (hereinafter referred to as public) is defined to be that public of the world which deals in such things as international trade and finance, and includes some citizens of the United States. The United States banking system is composed of a commercial banking system and a central bank (the Federal Reserve Banks and the United States Treasury combined). The foreign banking system is composed of a commercial banking system and all central banks.

The first operation considered is that of a member of the public placing a dollar denominated deposit from the United States commercial banking system into the foreign commercial banking system. By transferring dollars to a foreign bank, the public now owns a Eurodollar deposit, but to the public this deposit is indistinguishable from an ordinary dollar deposit in the United States except that the rate of return is higher on the Eurodollars. The foreign commercial banking system now has a dollar asset which is a liability of the United States banking system, and this dollar asset becomes part of the

Public		Foreign Commercial Bank	
A	L	A	L
-\$ (D) ²		+\$ (D)	+E\$ (E)
+E\$ (E)			

dollar-denominated reserves of the foreign banking system. This is an example of a "conversion" from dollars to Eurodollars.

The second circumstance is represented by a transaction which is Eurodollar creation. A member of the public borrows dollars from the foreign commercial banking system, giving a dollar-denominated note to the bank and receiving in turn a Eurodollar deposit. In this case note

Public		Foreign Commercial Bank	
A	L	A	L
+E\$ (E)	+E\$ Credit (F)	+E\$ Credit (F)	+E\$ (E)

that although this is dollar credit creation, it is not occurring in the United States. These foreign commercial banks are using dollar-denominated assets (dollar deposits in the United States [D], United States Treasury Bonds [Q] and gold, if any) as reserves from which dollar-denominated loans are made. When the loan is repaid, the Eurodollar credit is cancelled.

The third circumstance represents a change in denomination, but is unique in that the change is made between Eurodollar credits and

²Symbols in parentheses are those used by Blumberg; D - dollar deposits, E - Eurodollars, F - Eurodollar loans, and N - loans in currencies other than Eurodollars.

any foreign currency credit (designated as £ Credit). For example, a member of the public decides to convert a dollar loan from a foreign bank into a foreign currency loan. A net reduction of Eurodollar credit in the foreign banking system occurs.

Public		Foreign Commercial Bank	
A	L	A	L
	-E\$ Credit (F) + £ Credit (N)	-E\$ Credit (F) + £ Credit (N)	

The fourth operation results from a simple conversion in foreign exchange. If a member of the public wishes to convert a foreign currency deposit into a Eurocollar deposit, he merely requests his bank to redenominate the deposit in dollars. This transaction, of course, takes place at the current market rate of exchange less the profit margin of the bank. In the unusual event that the bank did not already own some dollar denominated reserves, it would be forced by good banking practice to acquire the reserves in order to meet potential dollar clearings.

Public		Foreign Commercial Bank	
A	L	A	L
-£ (K) ³ +E\$ (E)			-£ (K) +E\$ (E)

To summarize the foregoing, all four operations are presented below. These operations are to be considered independent of each

³Karats (K) are any and all non-dollar currencies.

other insofar as the "T" account is concerned. If it is assumed that the proceeds of all bank credit are held as deposits, then a one-to-one correspondence prevails between an increase of bank credit and deposit liabilities. Items number three and four considered together show, however, why the Eurodollar market is unique. Conversions can occur between different currencies and between credits denominated in different currencies. In the foreign commercial banking system, then, no reason exists a priori why additional Eurodollar credit creation (F) through a fractional reserve system should imply a corresponding increase in Eurodollars (E). Eurodollars are created when a foreign commercial bank generates a dollar-denominated demand deposit.

For example, an international trader in Europe desires a dollar-

Public		Foreign Commercial Bank	
A	L	A	L
1. -\$ (D) +E\$ (E)		+\$ (D)	+E\$ (E)
2. +E\$ (E)	+E\$ Credit (F)	+E\$ Credit (F)	+E\$ (E)
3.	-E\$ Credit (F) + £ Credit (N)	-E\$ Credit (F) + £ Credit (N)	
4. - £ (K) +E\$ (E)			- £ (K) +E\$ (E)

denominated loan (F) because it is cheaper than his domestic currency, but he wishes to use his domestic currency in transactions. The commercial bank extends to him a Eurodollar credit (F) and he receives a Eurodollar deposit in the bank. He could immediately take the proceeds of his Eurodollar credit (F), ignoring the costs of the exchange

transaction, and buy his domestic currency (K) at the current rate of exchange. Why should he, however, go through the motions of a foreign exchange transaction when the proceeds of the Eurodollar credit (F) could have been taken in the domestic currency (K) at the outset? The bank has acquired a dollar-denominated earning asset and incurred a liability in the domestic currency, that is, the total volume of Eurodollar credits has increased without a corresponding increase in Eurodollars.

The Eurodollar market is defined by the foregoing operations which themselves are the result of autonomous behavior on the part of members of the public and individual foreign commercial banks. With the advent of the Eurodollar market, then, the important institutional development is that foreign commercial banks can and do engage in dollar-denominated credit creation by using dollar liabilities of the United States banking system as reserves.⁴ Foreign dollar credit creation is further discussed in Chapters IV and V.

Those transactions which define the Eurodollar market also may give rise to other transactions in and among financial institutions. A discussion of some of these secondary transactions will serve to show the relationship between the activities of individuals and the macro-relationships of the Eurodollar market which are presented in the next section.

A Eurodollar deposit may come into existence if dollars are transferred from a United States bank to a foreign commercial bank. Assuming

⁴Blumberg.

that a non-resident of the United States desires to hold dollars or Eurodollars, he may transfer his dollar deposit, which may have been earned in foreign trade, to a bank abroad. The United States bank loses reserves⁵ and the foreign bank gains dollar "reserves". These dollar reserves may be retained by the foreign bank if they are needed; otherwise, the banks may buy karats with the dollars from the central bank.

If the dollars acquired are in excess of what the central bank wishes to hold, they may be converted into gold from the United States central bank⁶ or used to buy other foreign currencies. The central bank may, of course, elect to retain the dollars and invest in the Eurodollar market (by placing the dollars with a commercial bank) or United States Treasury bills.

The central bank of the United States interacts with foreign central banks in foreign exchange transactions, swaps and special transactions.⁷ Special transactions of the United States central bank

⁵Although the transfer of demand deposits abroad does not constitute a literal transfer of legal reserves abroad, the effect is the same as if reserves had been transferred. By transferring demand deposits out of the United States, the commercial banking system is unable to expand credit to the extent the legal reserves would have permitted. The effect of a demand deposit transfer on reserves is not, of course, one for one. Dollar demand deposits held by foreign banks constitute dollar "reserves" for the foreign banking system in this paper.

⁶In Blumberg's work, the Federal Reserve and the United States Treasury make up the central bank for the United States, and in his model, the Federal budget is assumed to be balanced.

⁷Blumberg has labeled as "special transactions" such things as swaps and special Treasury certificates ("Roosa Bonds"). These certificates are ". . . in the form of special Treasury certificates

are policy measures designed to improve or maintain the fixed value of the dollar. The effectiveness of these policies is discussed in Chapter V.

If a member of the public takes out a dollar loan (F) from a foreign commercial bank and takes the proceeds in Eurodollars (E), the bank must now hold sufficient dollars to meet any prospective dollar clearings. If the bank were to need additional dollar reserves, they could be obtained by (1) selling karats for dollars at the central bank, (2) borrowing dollars from the central bank, (3) selling karats for dollars in the open market and (4) borrowing dollars from another commercial bank, foreign or domestic. If the Eurodollars are paid to a United States resident and deposited in a commercial bank, the foreign banking system loses dollar reserves, and the United States banking system regains reserves. If the Eurodollars are paid instead to another foreigner, they may stay in circulation as Eurodollars.

The conversion of Eurodollars (E) into karats is a usual foreign exchange transaction. The bank may now require additional karat reserves in order to back the new karat demand deposit; these reserves could be acquired by selling dollars for karats. The counterpart to a foreign exchange transaction is the possibility of redenominating a

which are non-marketable but are convertible into cash at SHORT notice." (Capitals mine.) A swap of dollars for karats between the United States and foreign central banks . . ." usually results in an increase in the special Treasury certificates outstanding during the term of the swap." Monthly Review, Federal Reserve Bank of New York (New York: Volume 50, No. 6, June 1968), p. 122.

karat credit (N) into a Eurodollar credit (F). Admittedly, this operation would be unusual and it would not be likely to lead directly to any other transactions.

Even though a given transaction generally results in equal and opposite changes in the transactors' balances, the impact, if any, of these transactions on the balance of payments depends upon which actor initiates the transaction. For balance of payments considerations, for example, if the United States central bank buys karats, the dollar tends to be depreciated, while if a foreign central bank sells karats, the dollar tends to be appreciated, but in either case the transaction is the same on the balance sheets of both of the transactors. Much depends upon the identity of the initiator.

Section II: Eurodollar Market Relationships

Aryeh Blumberg developed several models in his research on the Eurodollar market and the basic operations and transactions of the market were presented from his work in Section I. In order to investigate time trends, magnitudes and co-variations, the conceptual model was elaborated into one which permitted the testing of empirical questions. From this model, certain balance of payments and Eurodollar variables will be presented in order to demonstrate relevant relationships and discuss some of the empirical findings. Those variables which affect the reserves⁸ of monetary authorities and/or the dollar

⁸In the immediate sense, gold and foreign exchange.

exchange rate are labeled balance of payments variables while the Eurodollar variables are those which deal directly with the operations of the Eurodollar market. These variables and relationships are defined for purposes of determining what has happened in the market and are not directly related to standard monetary theory.

The balance of payments variables are:

- g - the gold conversion ratio of foreign central banks
- d_z - the percentage of dollar assets outside the United States held by foreign central banks

The Eurodollar market variables are:

- d_b - percentage of dollar assets outside the United States held by foreign commercial banks
- G^{US} - quantity of gold bought from the United States Treasury during the time period
- D[Z] - dollar deposits held by foreign central banks
- D*[Z] - dollar assets held by foreign central banks⁹
- D[B] - dollar deposits owned by foreign commercial banks⁹
- D* - all dollar assets abroad
- Q - proceeds of special transactions which are held by foreign central banks
- E - Eurodollars (all dollar liabilities of the foreign commercial banking system)
- E* - net Eurodollar creation due to conversion of dollars or foreign currencies into Eurodollars

$$D^*[Z] \equiv D[Z] + Q + G^{US}$$

$$D^* \equiv D^*[Z] + D[B]$$

$$g \equiv G^{US}/D^*$$

$$d_z \equiv D^*[Z]/D^*$$

$$d_b \equiv D[B]/D^* \qquad d_z + d_b \equiv 1$$

⁹Dollar assets of foreign commercial banks are assumed to be sufficiently liquid that they can be considered as cash.

m - the reciprocal of the Eurodollar reserve ratio

$$m \equiv E/D[B]$$

M - the "Eurodollar multiplier"

$$M \equiv E/D^* = E/(D[B] + D^*[Z])$$

F - Eurodollar credits

f - the "net Eurodollar, conversion ratio"¹⁰

$$f \equiv 1 - (E - D^*)/F = 1 - E^*/F$$

Two of the variables, d_z and g , are indicators. As g increases, it becomes increasingly difficult for the United States to maintain the \$35/oz. price of gold, and, therefore, the official exchange rate. An interpretation of d_z is that it represents the degree of constraint on United States policy as far as balance of payments considerations are concerned. If the central banks are accumulating an increasing percentage of the American deficit, it is assumed in this model that the supply of dollars abroad is in excess of the demand. The situation would only be aggravated by rapid credit expansion in the United States.

The condition $D^* + F = E$ is termed the "balanced dollar position," and means simply that the net increase in dollar assets has gone to meet the demand for dollars. Note that in the model an excess of dollars would have depreciating pressures on the dollar exchange rate ($D^* + F > E$), but that excess demand for dollars would only cause more Eurodollar creation and thereby mitigate some of the appreciating pressures on the dollar exchange rate. Should a heavy demand for dollars continue, there would be net conversions of the proceeds of

¹⁰The regressions were run using F/E^* instead of f . Net Eurodollar creation $E^* = (E - D^*)$; $F/E^* = 1/(1 - f)$.

foreign currency loans (K) into Eurodollars (E), and the foreign currency would be suffering depreciating pressures.

From the model, the equilibrium condition (the absence of depreciating or appreciating pressures) for the dollar exchange rate is, then, $\frac{dE^*}{dt} = \frac{dF}{dt}$ where E^* is net Eurodollar creation. Implied is the condition $\frac{d}{dt} \frac{d_z}{dt} = 0$: assuming $d_z > 0$, the central banks hold the same percentage of dollars. If depreciating pressures are present, E^* would decline in absolute value and F would continue to reflect the borrowers' demand for Eurodollars, but when E^* and F move together and d_z is constant, depreciating pressures are absent and appreciating pressures are largely absent. If commercial bankers are willing to let their Eurodollar reserve ratio fluctuate, mild appreciating pressures are offset by Eurodollar credit creation. When $E^* = F$, there are no conversions of central bank dollars into Eurodollars, and if these two quantities are increasing, commercial banks are suffering a declining Eurodollar reserve ratio.

If $E^* = F$, then the relation $f = 1 - E^*/F$ is zero, and if it is assumed that commercial banks wish to maintain a constant dollar reserve ratio for the period, then d_z should decline. Further acquisitions of dollars are used to back more credit, and none would be going to the central banks. The equilibrium condition means that not only are the central banks not gaining dollars which could pressure official reserves, but neither is there any pressure on the dollar exchange rate.

One question now to be investigated is the behavior of the reciprocal of the Eurodollar reserve ratio (m) and the Eurodollar

multiplier (M). Furthermore, what, if any, relationships exist between m and d_z , M and d_z , g and d_z , and F/E^* and d_z ? Because of the very nature of these variables, close relationships would certainly be expected in some cases. For example, in the case of m and d_z , if more dollar deposits are held against a constant volume of Eurodollars, the central bank would hold a smaller share of the total dollar assets in the banking system.

Section III: Some Empirical Findings

Blumberg used raw data from publications of the Bank for International Settlements at Basle, Switzerland, and due to the organization of data by the Bank, regional breakdowns for test variables were predetermined. Three major foreign regions were considered: Canada, Japan and the Eight which consists of Belgium and Luxemburg, France, Germany, Italy, The Netherlands, Sweden and United Kingdom.

Some of Blumberg's work is presented to demonstrate the behavior of the important variables over the last several years (1962-66). Due to the lack of data, not all regressions have the same base time period, but certain patterns are clearly discernible in most cases. The data are annual up to and including the year 1962 after which they are quarterly. The regressions are presented for specified regions or countries.

banks placing dollar assets (D) at the disposal of the home office in the United States. Since the proceeds of this kind of loan (from a foreign commercial bank to an American commercial bank) do not appear as Eurodollars abroad, D[B] grows disproportionately when compared with E. Within the framework of the model, then, the "Eurodollars" have leaked out of the system.

The relationship between M and d_z is implicit within the model; a rising M ($M = E/D^*$) implies an increasing E, a decreasing D^* or both. In any of the cases, dollar reserves are required within the commercial banking system to back whatever amount of Eurodollars there are, and any effective increase in E would necessitate the transfer of dollar reserves from the central banks to the commercial banks. The following regression for the Eight seems to support the preceding statements.

$$\log d_z = 6.721 - 0.535 \log M \quad r = 0.823$$

(0.458) (0.0106)

Over the time period tested, d_z has been declining as M increased.¹²

In the case of F/E^* and d_z , the relationships will be more understandable if F/E^* is conceptualized in the following manner. The ratio, F/E^* will change as members of the public convert into or out of Eurodollars. If F is held constant, net conversions out of Eurodollars will lower the ratio and net conversion into Eurodollars will raise the ratio (the fluctuations of this ratio appear as changes in absolute value and sign). As there are net conversions into

¹²ibid.

Eurodollars, then, d_z is expected to decline because the foreign commercial banks would require additional dollar reserves to hold against a rising volume of Eurodollars (demand deposits); conversely, as there are net conversions out of Eurodollars, the foreign central banks will be increasing their share of dollar assets as the foreign commercial banks acquire karat reserves by selling their dollar reserves. The regression for the Eight European countries apparently supports the foregoing.

$$\log d_z = 2.287 - 0.136 \log F/E^* \quad r = - 0.889$$

(0.026) (0.020)

Over the time period tested, the net conversions out of Eurodollars has been declining.¹³

The relationship between d_z and g , if any, could perhaps reveal some characteristics which have direct bearing on the balance of payments. The gold conversions ratio ($g = G^{US}/D^*$) would generally be expected to fall as d_z declined, and vice versa. The regression for the Eight fails to lend much support to the preceding statement.

$$\log g = 0.261 + 0.955 \log d_z \quad r = 0.682$$

(0.836) (0.387)

In this expression, the constant term fails the test of significance, but otherwise, the regression indicates perhaps a quite small relationship between g and d_z . A more fruitful approach might be an investigation of the volume of liquid dollar assets held by the central bank as compared to the gold conversion ratio.

¹³ibid.

The regressions presented here are representative of all those which Blumberg did. In the estimation of this writer, the tests of significance are generally good and the correlations are quite good; there is sufficient empirical support for the model as defined by Blumberg to warrant further use of his variables. Furthermore, at the present time, this is the only analytical model available to this writer. Even if the model has been satisfactorily validated, what has been accomplished is a good analytical description of the activity within the Eurodollar market and some institutions which are a part of the market; causation cannot be inferred from these results. The movement of these variables, however, does yield a very good picture of the Eurodollar market and some variables related to the balance of payments problem.

CHAPTER V

THE EURODOLLAR MARKET AND THE UNITED STATES BALANCE OF PAYMENTS

Thus far, the Eurodollar market has been precisely defined, a good analytical framework has been presented and the behavior of the market over a short time period has been described. The central question still remains, however; does the Eurodollar market affect the balance of payments of the United States?

That the balance of payments has been helped by foreigners' holding more dollars is fact. Consider then the following hypothesis: Foreigners are holding more dollars because the Eurodollar market exists. If the hypothesis is true, then the variables of the Blumberg model should behave in a particular manner. Refer now to the table on the next page, "Time Trends."¹

First, the gold conversion ratio should be declining, which it is; the share of dollar assets held by the central banks, d_z , should also be declining because the foreign central banks act as a dollar pool for their commercial banks and the Eurodollar market permits an increasing demand for dollars to be expressed. From the data for the period observed, d_z has been declining despite the continuing deficit

¹This table was developed by Blumberg. Due to the nature of the data on gold conversions, it was necessary for him to compute a "minimum" and a "maximum" conversion ratio for each time period. Data for the computation of m and M were not available for the years preceding 1963. Blumberg stated that the time trends for g , m , and d_z were down, and for M and d_b the time trends are up.

TABLE 1. TIME TRENDS FOR EIGHT EUROPEAN COUNTRIES²

Eurodollar Reserve Ratios, Eurodollar Multipliers, Percentage Share of Reserves of Banks and Official Monetary Institutions, and Gold-Conversion Ratios

End of Year or Quarter	m (1)	M (2)	d _B (100%) (3)	d _Z (100%) (4)	g (min.) (100%) (5)	g (max.) (100%) (6)
Dec 58			8.5	91.5	74.0	76.0
Dec 59			5.0	94.9	70.2	73.0
Dec 60			10.2	89.7	63.1	67.7
Dec 61			14.1	85.8	57.5	60.3
Dec 62			10.7	89.2	63.2	70.0
Sep 63	5.59	0.63	11.1	88.7	57.9	65.1
Dec 63	5.79	0.64	11.0	88.9	59.9	68.8
Mar 64	4.70	0.63	13.4	86.6	60.0	68.2
Jun 64	5.60	0.67	12.0	87.9	59.0	68.4
Sep 64	5.25	0.70	13.2	86.7	54.7	65.3
Dec 64	5.31	0.79	14.8	85.2	51.2	62.8
Mar 65	5.07	0.73	14.3	85.6	56.3	66.0
Jun 65	4.98	0.72	14.4	85.6	57.8	68.8
Sep 65	4.79	0.74	15.8	84.1	52.5	66.7
Dec 65	5.93	0.81	13.6	86.4	55.6	67.8
Mar 66	3.77	0.77	20.4	79.6	57.7	68.1
Jun 66	3.73	0.80	21.5	78.5	56.2	66.5
Sep 66	3.30	0.87	26.5	73.5	55.1	65.0
Dec 66	2.94	0.89	30.3	69.7	53.1	63.3

²Aryeh Blumberg.

of the United States; by definition, the share of dollar assets held by the commercial banks has been increasing. Furthermore, the rate of substitution of Eurodollars for dollars and karats, (M), has gone from zero in 1957 to around 80 per cent in 1967, and the "net Euro-dollar conversion ratio" increased over the period tested for the Eight, which is also consistent with the hypothesis.³ The percentage of Eurodollars of the total money stock of the Eight European countries⁴ has remained very nearly constant in the time period observed, while the quantity of Eurodollars has nearly doubled. None of the preceding variables has behaved in such a manner so as to contradict the hypothesis; the indications are very strong that a Eurodollar effect does indeed exist.

The preceding discussion of time trends is about as much as can be inferred, given the work which has been done so far; but Blumberg's work perhaps suggests an extension of the analysis. The Eurodollar market has been exhaustively studied, but the balance of payments question (as defined in Chapter II) has not. The topic at hand primarily revolves around depreciating pressures on the dollar and the mitigation of those pressures. The depreciating pressures are measurable with the Eurodollar model but the measurement of mitigation is not. How much official activity on the part of the United States is required to maintain the dollar exchange rate? Can the intensity of

³Blumberg.

⁴Not shown on the table; Blumberg's computations.

this activity be correlated with relevant Eurodollar variables? These questions get at the heart of the problem of a Eurodollar effect.

What is required is a quantifiable index of official activity of the United States which permits the measurement of the rate at which the dollar exchange rate is defended. Alone, net transfers of reserves are not sufficient to serve as the index; official exchange rate defense is conducted in many ways, e.g., the buying and selling of gold, spot sale or purchase of foreign exchange, dealing in the forward markets, and dealing in spot and forward markets simultaneously. If such an index is developed, and data are available for the time period of 1952 to 1967, for example, the index and such Eurodollar variables as m , M , and d_z could be tested for correlation. The index as described would have to be modified to account for the rate of net deficits (or surpluses) in order to avoid excessive bias, but the validation of the modified index would present a much more difficult problem.

Not only is there a demand for dollars abroad, but the Eurodollar market creates an incentive for foreign (and domestic) owners of dollar deposits to make these balances available to meet the foreign demand. Furthermore, foreign central banks are induced to hold some of their dollars in the Eurodollar market (they hold large sums in Treasury bills) since the return is higher. Frequently, too, the Eurodollar market may be used by foreign central bankers and the Bank for International Settlements to influence liquidity within the market itself by

selectively placing funds with commercial banks.⁵ The active supply of Eurodollars is increased and interest rates are pressured downward.

The Eurodollar market has also altered the results or supposed results of certain policies of the United States monetary authorities. One such policy of the Treasury was to swap quantities of currencies with other central banks so that the foreign currency could be sold against the dollar thereby initiating some appreciating pressures on the dollar. This policy also accomplished, however, the raising of d_z by putting more dollars at the disposal of the foreign central bank with whom the swap was concluded. To the extent that the foreign central bankers consider the proceeds of the swap as "frozen," it is assumed that d_z is unaffected.⁶ The United States Treasury has also engaged in a series of special transactions with other central banks with the central purpose of reducing the effective supply of dollars abroad. Whether such activity is successful largely depends upon the point of view of the foreign central bankers. If these bankers consider their "Roosa Bonds"⁷ as part of their dollar assets, then d_z and g should be largely unaffected by the transaction (the Treasury has not achieved its goal). Conversely, if the bonds are not considered part of the dollar assets of the central bank, d_z should decline and g would be biased downward.

⁵Fred H. Klopstock, "The International Money Market: Structure, Scope and Instruments," Journal of Finance (Vol. XX, No. 2, May 1965), pp. 184-214.

⁶Here d_z is being discussed as a non-quantitative indicator, and not as a statistical variable.

⁷See Chapter IV, footnote 7.

The Eurodollar market may also be increasing the rate of economic integration.⁸ With full convertibility and the development of the Eurodollar market, excess dollar liquidity in one country is now availability in a country which otherwise would have had a dollar or capital shortage. The Eurodollar market facilitates the flow of liquidity and, in some cases, provides reserves for the expansion of the domestic foreign money supply. The process really differs little from the case where one bank borrows reserves from another, as in the Federal Funds Market. The difference, of course, is that the borrowed funds come from outside the country and its banking system. The borrowing commercial bank may not even bother to convert the Eurodollars into the domestic currency since their central bank must stand ready to buy or sell its currency at the pegged rate.

The Eurodollar market may be transmitting pressures which will eventually force interest rate, by policy and free markets, in the various countries to diverge less and less.⁹ Such a trend would, hopefully, help to bring the various rates of economic expansion among the countries into line with each other.

According to Blumberg, the Eurodollar reserve ratio $D[B]/E$ is a measure of economic integration between the United States and other dollar-area countries; the larger the reserve ratio, the greater the degree of integration. As might be expected, the larger the number and

⁸Fred H. Klopstock, "The Eurodollar Market: Some Unresolved Issues," Essays in International Finance, Princeton University (No. 65, March 1968), p. 23.

⁹Ibid., p. 20.

volume of dollar transactions with the United States, the larger the quantity of dollars that the bankers of a country would want to keep in reserve. He found that Canada has the largest Eurodollar reserve ratio of those measured with Japan second and the Eight in third place. Canadian banks have a very large volume of dollar clearings and, therefore, it is likely that their commercial bankers feel that they must keep a fair quantity of dollar reserves on hand. The Eight have a peculiar situation inasmuch as many American branches in Europe borrow very large sums which are put at the disposal of the home offices for credit extension in the United States.

Further indications of economic integration might be the high rate of foreign investment by American firms. These firms are using the Eurodollar market as a source of liquid funds and a place to keep the proceeds of foreign-floated, dollar-denominated bond issues until such times as the funds are needed. This opportunity to acquire dollar liquidity abroad by these firms is especially significant in that the restrictions on capital outflows could have seriously hampered their operations. As it happened, the restrictions helped to further alleviate the dollar glut abroad, although financing costs of the firms involved were raised in the process since Eurodollar bonds command somewhat higher rates of interest than bonds floated in the United States.¹⁰

That the Eurodollar market may be increasing the rate of economic integration could perhaps be tested by determining whether or not there

¹⁰Paul Einzig, Foreign Dollar Loans in Europe (London: MacMillan & Co., Ltd., 1965), pp. 70-73.

has been a leveling of bank and market rates of interest. These rates would not have to be identical, but rather the differences must be declining over time. A study of this question would certainly be interesting, but the question, so simply put, somewhat obscures the fact that the actions of monetary authorities would have to be considered in order to detect the effect of the Eurodollar market on the various foreign interest rates.

Another important effect of the Eurodollar market on the balance of payments has to do with domestic credit policy in the United States. The Federal Reserve Board of the United States has been pursuing a relatively tight money policy which under other circumstances would have forced the commercial banking system to cut back considerably on loans, but because the commercial banks have access to Eurodollars, they are able to continue extending credit by using borrowed Eurodollars as reserves.¹¹ In early 1968, United States banks were borrowing heavily in the Eurodollar market in order to make more loans to domestic customers. These funds being borrowed by the banks' foreign branches are carried as demand deposits with the home office.

. . . nearly \$8 billion [are] held by the foreign branches of the United States banks with their head offices. In addition, the head offices of foreign commercial banks have held substantial demand deposits with their agencies or branches in the United States. The holdings of the head offices of Canadian and Japanese agencies in the United States have been quite large. Just as any bank employs its deposits to acquire earning assets, the United States institutions involved--i.e., the United States

¹¹ W. Dennis Wright, private meeting held at the Continental Illinois National Bank and Trust Company of Chicago, June 1968.

head offices of their foreign branches and the Japanese and Canadian agencies in the United States--use their resources to acquire such assets. But the relationship between head office and branch or agency is a far closer one than just bank and depositor, so that the foreign branch or head office does in effect, through its intercorporate accounts, share in the return on the United States entity's assets earned with the resources placed in the United States by the related foreign branch or head office.¹²

Because the taking by United States banks of Eurodollars increases the dollar preference of foreigners, this activity is helpful in maintaining the official exchange rate of the dollar, but if the Federal Reserve Board is genuinely interested in curtailing domestic credit as much as their actions suggest, the policy is dulled in its effectiveness by the existence of the Eurodollar market. The policy could have been instituted with the hope that the commercial banks would indeed use the Eurodollar market for additional liquidity, but if domestic credit restraint is the intended goal, then the Federal Reserve Board may very well find itself in a serious dilemma. If easy money is once again desired, a fairly sudden loosening would likely free large sums in the Eurodollar market, and therefore, increase depreciating pressure on the dollar exchange rate. The preceding events would, furthermore, cause Eurodollar rates to fall, ceterus paribus, and foreign owners of dollars would then be induced to seek alternative karat-denominated investments with a higher return if they did not require dollar transactions balances. Is the Federal Reserve Board now constrained to maintain tight money?

¹² Federal Reserve Bank of New York, Monthly Review (New York, Vol. 50, No. 6, June 1968), pp. 124-25.

The fact, however, that the commercial banks do operate in this manner gives the Federal Reserve Board a powerful weapon with which to reduce excess dollar liquidity abroad. Such a policy is particularly useful for short-run considerations, but the foregoing suggests that it would be quite risky to consider this policy as a continuing solution. If it becomes obvious that the dollar preference of foreigners is seriously declining, the Federal Reserve Board needs only to slow the growth of the money supply sufficiently to cause United States banks to substantially increase Eurodollar takings, and consequently boost the rate on Eurodollars, making them more attractive to foreign dollar-holders. However strong the rationale may be for raising domestic interest rates to alleviate dollar problems on the international scene, the Federal Reserve Board may have simultaneously a very strong reason for generating lower domestic rates. The United States is fortunate that conditions demand high interest rates domestically for both domestic and international purposes in 1969. An important side effect is the added cost to doing business domestically. Borrowers are faced with higher interest rates and therefore higher costs, although the banks are making more profit.

The last effect of the Eurodollar market on the balance of payments to be discussed deals with the possibility of dollar credit creation outside the United States. The Eurodollar market essentially nullifies the possibility of appreciating pressure on the dollar. Assuming there are no restrictions on Eurodollar credit expansion, any excess demand for dollars can be met by multiple credit expansion in Eurodollars, provided of course that the foreign commercial banking

system has "sufficient"¹³ dollar reserves. In the event of insufficient reserves, the commercial banks would go, of course, to the central banks for more dollar liquidity. Once most of the dollars were in use as reserves, the interest rate on Eurodollars would begin to rise. All of the foregoing suggests a strong and continuing demand for dollars; i.e., the United States monetary authorities would not be worried about the exchange rate of the dollar, and that there should be few, if any, restrictions on capital movements out of the United States. As the rate on Eurodollars continued to climb, additional foreigners who own dollar deposits in the United States, and residents of the United States would be induced to place funds in the Eurodollar market. In the event credit were tight in the United States, the additional pressure from the Eurodollar market might well cause the monetary authorities to take action to loosen credit. What does it all mean? When there are strong appreciating pressures on the dollar, Eurodollar credit expansion abroad and capital flows out of the United States tend to mitigate those pressures, capital export restrictions notwithstanding. That is, because the Eurodollar market may also be part of a fractional reserve system of credit expansion denominated in dollars, additional exports of dollars from the United States are not necessary to meet an increasing demand for dollars abroad. Appreciating pressures on the dollar are offset in this manner. The converse, unfortunately, does not appear to be true. Appreciating pressures on karats (depreciating pressures

¹³What would be "sufficient" lies in the realm of good banking practice and is, consequently, a decision to be made by individual bankers.

on dollars), do not give rise to karat credit expansion in the United States, nor to karat capital flows to the United States. If the karat were one currency, Eurodollar credit expansion might have an opposite counterpart; that the karat represents many monies which are not in high-quantity use as vehicle currencies perhaps explains the one-sidedness of this phenomenon.

That a Eurodollar market effect does indeed exist may be a safe conclusion; yet the effect still escapes quantification. This writer has pointed out, however, some very definite directions for further work, viz., the measurement of interest rate disparity among the relevant countries and the development of the modified index for measurement of dollar exchange rate activity and further, that the index be tested against Eurodollar variables such as m , M and d_z .

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