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The Eurocurrency Market - A Demand Approach

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Abstract

In this paper, it is argued that under present institutional arrangements, central banks have little control over the volume of Eurocurrencies in existence at any time. Instead, the international banking system is able to adjust the amount of Eurocurrencies to the needs of trade and finance. That is, the volume of Eurocurrencies is essentially demand determined.

Much has been written about the Eurocurrency markets.[1] However, many writers have neglected to take account of certain banking practices that are central to Eurobanking activities and that differ markedly from standard domestic banking practices. Because these special features of Eurobanking are not well documented, some economists have drawn erroneous analogies to domestic banking systems and have misinterpreted the economic implications of the Euromarkets.[2]

1. Money creation by domestic banks and Eurobanks

It is no longer a controversial proposition that banks can create money. The money creation potential of the banking system is limited in virtually all nations by the imposition of reserve requirements that force banks to hold more reserves than they ordinarily would elect to hold. The ability of the authorities to control the money supply is made much more precise because the reserve requirements exceed the percentage of reserve assets that banks would otherwise hold. By forcing banks to hold a disproportionally large percentage of their assets in the form of central bank liabilities, the monetary authorities are able to control the money supply because banks do not find it economically advantageous to hold a larger percentage of reserve assets and are prohibited by regulation from holding a smaller than required percentage of reserve assets. Because the monetary authorities also control the monetary base they are in a position to determine the nation's money supply within relatively narrow bounds.

To assess the money creating capacity of Eurobanks it may be instructive to consider what would happen to the money creating potential of, say, New York City banks if they were no longer subject to any minimum reserve requirements.[3] Clearly, they are able to continue to play their role in the U.S. money creation process just as well as--if not better than--when they are subject to the regulatory constraint by the monetary authorities. Also, it is clear that the demand and time deposit liabilities of these banks are still part of the U.S. money supply before and after the deregulation.[4] Consequently, it is difficult to argue that if banks or individuals voluntarily shift their U.S. dollar activities to an offshore center to gain certain cost advantages, that their money creation potential is reduced or eliminated or that the total U.S. dollar stock is reduced.

1/ See especially the seminal articles by Friedman (7), Machlup (8) and Niehans and Hewson (11) as well as the excellent survey by McKinnon (9).

2/ For simplicity and conciseness much of the argument will be presented in terms of the Eurodollar market, which represents, by far, the most important segment of the Eurocurrency market. Where relevant, observations will be made regarding other Eurocurrencies.

3/ A proposal to create a free trade zone for international banking activities of New York banks has recently been put forth by The New York State Bankers Association. (cf. New York Times, November 22, 1977, p. 51). This proposal called for the elimination of reserve requirements for certain international banking activities only.

4/ This important point was made forcefully by Machlup (8).

This argument illustrates that Eurobanks can create money just like domestic banks and that it is necessary to take Eurocurrencies into consideration when an attempt is made to determine the amount of monetary assets in existence. It is therefore important to assess the money creating potential of the Eurobanks.

Economists have applied various multiplier approaches to the Euromarkets and recently researchers have utilized portfolio theory to assess the expansionary potential of the offshore banking system. It may be useful to review briefly these approaches and their main shortcomings before presenting an alternative and hopefully more realistic approach to the Euromarkets.

2. The traditional multiplier and portfolio approaches

Numerous studies have attempted to calculate Eurocurrency multipliers akin to domestic money multipliers. Two basic approaches may be distinguished: (1) the bank reserve multiplier and (2) the initial deposit multiplier.1/

The bank reserve multiplier focuses on the relationship between the Eurobanks' deposit liabilities and the stock of precautionary reserves held by them with domestic banks. This approach is based on a stock equilibrium concept which is observed after all adjustments have been made by the banks. The bank reserve multiplier (m_b) is then defined as the inverse of the reserve ratio (r): $m_b = 1/r$.

Table 1 presents relevant data for the Eurodollar multipliers. Columns (1) and (2) show the holdings of liquid dollar assets of foreign banks at U.S. banks, which are regarded as the reserve base. Columns (3) and (4) show the estimated gross and net size of the Eurodollar market. The various possible multipliers are shown in the following columns. Column (5) gives the Eurodollar multiplier based on the gross size of the Euromarket and the narrowly defined reserve base, while Column (6) calculates the same multiplier utilizing the broader reserve base. Columns (7) and (8) repeat the calculations for the net size of the Euromarket. All four multipliers have in common that they have increased more than tenfold over the period studied. The reason for this phenomenon is that,over the ten-year span from the end of 1966 to the end of 1976, demand deposits at U.S. commercial banks increased only marginally by $2.5 billion and time deposits by $1.1 billion,2/ while the gross size of the Eurodollar market increased by $215 billion and the net size by $171.3 billion. This is evidence that Eurobanks do not hold a fixed percentage of their assets in the form of reserves at dollar based banks. The same applies to other currencies.

1/ Cf. Willms (14) for a detailed description of these concepts and a survey of empirical estimates.

2/ Foreign banks had net dollar demand liabilities of $5.7 billion to foreign branches of U.S. banks at the end of 1976. Consequently, there were no net reserve holdings at foreign branches of dollar based banks.

The dollar balances actually held by Eurobanks at U.S. commercial banks represent either minimal working balances or compensatory balances for services rendered--such as clearing functions. How Eurobanks provide for their liquidity needs will be discussed in detail below.

Because Eurobanks do not hold liquid reserve assets against their liabilities, there is little sense in searching for a stable bank reserve multiplier that would permit us to analyze the likely or potential expansion of the Euromarkets. Friedman recognized that "if Eurodollar banks held zero prudential reserves--as is sometimes claimed that they do against time deposits--100 per cent of the outstanding deposits would be created deposits and the potential multiplier would be infinite." (7, p. 10) But he goes on to argue that the actual multiplier is close to unity because there is very little redepositing in the Euromarkets. By this he switches attention to the initial deposit multiplier, a subject to which we will turn next.

The initial deposit multiplier is designed to measure the likely expansion in, say, Eurodollars that results from the receipt of a primary dollar deposit1/ by a Eurobank. The size of this multiplier (m_d) depends on the bank reserve ratio (r) and the leakage coefficient (q) out of the Eurobanking system:

$$M_d = 1/[1 - (1-r)(1-q)].$$

Larger numerical values for either parameter will result in a smaller multiplier. Estimates of the deposit multiplier made by various authors tend to cluster in the range of one to two. There is general agreement that the initial deposit multiplier is rather small.2/

There is a little known institutional fact that has an important bearing on the leakage ratio. It is customary for Eurobanks to disburse Eurocurrency loans by placing the funds at the disposal of the customer in his account with a bank located in the country whose currency is being drawn. That is, U.S. dollar loans are generally paid through New York banks, DM loans through Frankfurt banks, and so on. Consequently, the Eurocurrencies are "repatriated" immediately and new outflows are required if the funds are to return to the Eurobanking system. To distinguish these funds from other balances shifting from national to Euromarkets is impossible. Therefore, the concept of the initial deposit multiplier is not very helpful in judging the expansionary potential of the Euromarkets, and calculations of this multiplier are meaningless.

1/ A primary Eurodollar deposit may take the form of a switch by non-banks or central banks from U.S. dollars to Eurodollars, or dollar lending by U.S. banks to Eurobanks.

2/ Cf. Willms (14) for a survey.

Table 1. Eurodollar Multipliers

(In billions of US dollars)

End of	Dollar Deposits of Foreign Banks held at Domestic U.S. Banks		Size of Eurodollar Market		Eurodollar Multipliers			
	Demand	Time	Gross	Net	(3/1)	3/(1+2)	4/1	4/(1+2)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1966	6.6	1.2	14.8	11.6	2.2	1.9	1.8	1.5
1967	7.8	1.1	18.1	14.1	2.3	2.0	1.8	1.6
1968	10.4	1.3	26.9	19.9	2.6	2.3	1.9	1.7
1969	16.8	2.0	46.2	35.8	2.8	2.5	2.1	1.9
1970	12.4	1.3	58.7	44.4	4.7	4.9	3.6	3.2
1971	3.4	0.3	70.8	51.4	20.8	19.1	15.1	13.9
1972	4.7	0.4	96.7	67.5	20.6	19.0	14.4	13.2
1973	6.9	0.5	131.4	90.3	19.0	17.8	13.1	12.2
1974	8.2	1.9	156.4	125.4	19.1	15.5	15.3	12.4
1975	7.5	1.8	189.5	150.2	25.3	20.4	20.0	16.2
1976	9.1	2.3	230.0	182.9	25.3	20.2	20.1	16.0

Sources: (1) (2), Treasury Bulletin, 9/77, p. 90.
(3) BIS, Annual Reports, various issues.
(4) Estimated by assuming that the net Eurodollar market has the same size relative to the entire net Eurocurrency market as the gross Eurodollar market has to the gross Eurocurrency market.

Adherents of the portfolio approach[1/] argue that substitution effects among Eurodollars and domestic dollars working through interest rate and exchange rate reactions provide a stable relationship between the two markets, so that the growth of Eurodollar balances is effectively limited by the growth of U.S. monetary aggregates. Crucial to this approach is the recognition that Eurodollar deposits and comparable U.S. deposits are very close substitutes and that interest rates between these assets will not differ substantially. Assuming this to be true, adherents of the portfolio approach argue that the entire system comprising Eurodollars and domestic U.S. dollars is stable because:

> "the international stock of assets denominated in the same currency can grow at a faster rate (than the domestic stock) only if there is some factor that makes international deposits more attractive. Offshore banks...do need extra deposits in the commercial banks of the country whose currency is at issue."2/

This approach is predicated on the existence of a stable demand function for domestic and foreign assets in which both asset categories are demanded in well determined proportions.

Two observations are in order: for one, the amount of Eurodollars has grown in the last two decades at rates far in excess of the growth rates of domestic monetary aggregates. Table 2 shows the growth rate of the gross and net size of the Eurodollar market and the growth rate of the three most widely used monetary aggregates for the years 1967 to 1976. It is clear that the Eurodollar growth rates have always exceeded the U.S. monetary growth rates by a substantial margin.

Second, there are good reasons why banking in the unregulated Euromarkets is more attractive than in the regulated domestic markets. It may be useful to distinguish between those reasons that have their origin in regulatory measures taken by monetary authorities and which would be subject to policy action and those advantages that are inherent in the nature of Eurobanking and that are not necessarily reversible.

Among the regulatory reasons for the emergence and fast growth of the Eurodollar3/ market is the absence of statutory reserve requirements, lower (or even zero) tax rates, FDIC charges, the U.S. interest equalization tax (now abolished), voluntary foreign lending limits for banks (also abolished), and the freedom from constraint to pay interest on short-term deposits.4/

1/ Cf. Crockett and Knight (4) and Crockett and White (5).

2/ Crockett and White,(5, p. 7).

3/ Similar, but not necessarily identical reasons apply to the other Eurocurrencies.

4/ While Regulation Q prohibits the payment of interest on less-than-30 day deposits, bank repurchase agreements do provide a way to circumvent this restriction for large depositors.

Table 2. Growth Rates of U.S. Monetary Aggregates and Eurodollars

(in per cent)

Year	U.S. Money Stock			Eurodollars	
	M1	M2	M3	Gross	Net
1967	6.6	10.0	9.8	22.3	21.6
1968	8.0	9.4	8.4	48.6	41.1
1969	3.3	2.4	3.0	71.7	80.8
1970	5.2	8.0	8.0	27.1	24.0
1971	6.5	11.4	13.5	20.6	15.8
1972	9.2	11.4	13.4	36.6	31.3
1973	6.0	8.8	8.8	35.9	33.8
1974	4.6	7.2	6.8	19.0	38.9
1975	4.1	8.5	11.3	21.2	19.8
1976	5.8	11.3	13.1	21.4	21.8

Correlation Coefficients

	U.S. Money Growth Rate		
	M1	M2	M3
Eurodollar growth: Gross	-.10	-.67	-.64
Eurodollar growth: Net	-.36	-.85	-.82

Source: Economic Report of the President, January 1978 and Table 1.

Among the inherent advantages of Eurodollar operations is the convenience of maintaining balances in a major currency at banks located in major trade centers. Some observers also attach importance to the alleged lower risk of seizure of dollar funds if these balances are held in offshore banks. This latter reason was thought to be important in the late fifties and early sixties with respect to Soviet dollar holdings and more recently with respect to dollar balances held by certain OPEC countries. Of course, this reasoning can be reversed if the risk of seizure or sequestration of dollar funds by foreign authorities is judged to be higher.

In short, we can identify several reasons that result in a comparative cost advantage and other attractive features of offshore banking operations. As long as the Euromarkets enjoy such a competitive advantage over domestic markets, there exists the likelihood that their growth rates will continue to exceed those observed in domestic markets. Having reached this conclusion, the question as to what factors govern the growth of the Eurocurrency markets still remains open. To this question we will turn next.

3. A demand approach to the growth of Euromarkets

We will argue here that the volume of Eurocurrencies in existence is essentially demand determined. There exists at present no effective control over the volume of Eurocurrencies or their growth rate on behalf of governmental authorities. Instead, the markets respond to the needs of trade and finance and the preferences of economic entities around the globe.

Three key observations are important for the validity of this argument: One, the Euromarkets have a continuing cost advantage over domestic money markets. Two, banks active in the Euromarket do not hold systematic reserve balances with commercial banks based in the countries with the relevant currencies (such as U.S. banks in New York in case of Eurodollars), but they rely on the interbank market for liquidity. Three, in general, central banks in the relevant countries formulate their monetary policy by focusing on domestic economic developments and do not pay much attention to developments in offshore money markets. Some observations regarding these points are in order.

Regarding the first point, it was argued that there exist several factors that contribute to lower operating costs in the Euromakets as compared to the domestic markets. Among these are lower taxation abroad, absence of FDIC charges, and--probably most important--the absence of reserve requirements. It is instructive to show the relationship between the interest rate on 3-month U.S. domestic large negotiable certificates of deposit and the 3-month Eurodollar deposit rate. The weekly data for the year 1977 are presented in Figure 1. Shown as a dashed line is the U.S. domestic C.D. rate adjusted for the 6 per cent reserve requirements in effect for certificates of deposits held at Federal Reserve member banks with more than $5 million in total time deposits.1/ It is evident from the

1/ The adjusted rate is calculated as follows:

$$r_{adjusted} = r_{C.D.} \cdot \frac{100}{94}$$

figure that there is a very close correspondence between the Eurodollar rate and the domestic C.D. rate adjusted for reserve requirements. There is a virtually constant differential between the domestic C.D. rate and the Eurodollar rate, which is accounted for by the 6 per cent reserve requirement. From the depositor's viewpoint this makes Eurodollar consistently more attractive. If offshore banks wish to attract new funds from the domestic markets they can do so at will because they are in a position to offer more attractive rates. This observation is in accordance with another operating characteristic of Eurobanks; they tend to make their loan arrangements first and only then worry about appropriate funding of these loans. Of course, all this does not imply that offshore banks make consistently higher profits than domestic banks as essentially free entry into the offshore banking system will compete away any existing excess profits. The Eurobank depositors benefit fully from the absence of reserve requirements in the form of higher rates obtained.

Second, in support of the observation that Eurobanks do not hold precautionary reserves in the currency in which their liabilities are denominated, Table 1 shows that demand and time deposits of foreign banks at U.S. commercial banks increased only marginally from $7.8 billion to $11.4 billion over the 1966-76 decade, while their dollar liabilities increased sharply from $14.8 billion to $230.0 billion. From these data, it is clear that Eurobanks do not increase their liquid dollar reserves pari passu with an increase in their dollar liabilities. They do not hold a predetermined proportion of their assets in the form of precautionary reserves.

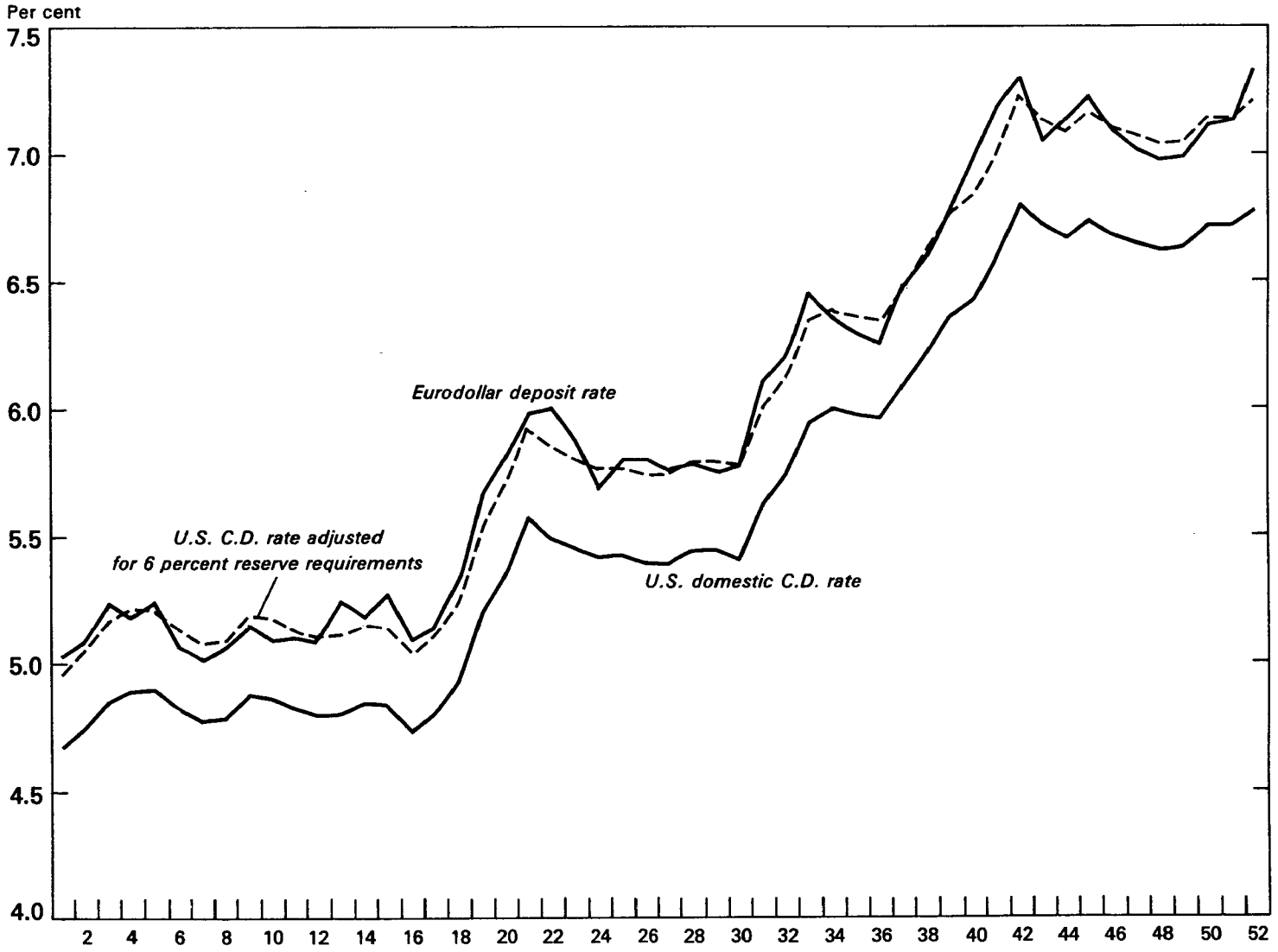
The question arises as to how Eurobanks provide for their liquidity needs. Two factors need to be considered here. Eurobanks pay considerable attention to the maturity structure of their assets and liabilities. While some banks match maturities to the extent possible, others engage in maturity transformation. But the key to the liquidity management of the Eurobanks is their reliance on the interbank market for funding and liquidity purposes.1/ The ready access to a deep and well developed interbank market makes it possible to eliminate the holding of idle liquid reserves. Instead, reliance is placed upon an active liquidity management and the bank's good credit with other banks active in the interbank to obtain funds if they are needed.

These institutional features have important macroeconomic consequences because the lack of a domestic reserve base in the form of deposits with commercial banks in the country whose currency is used allows the Eurodollar market to expand independently at a more or less rapid rate than the relevant domestic monetary aggregates. For instance, during times of slow monetary growth in the United States the Eurodollar market has grown more rapidly while during periods of rapid domestic monetary expansion the Eurodollar growth rates slowed down. Table 1 shows the growth rates of the U.S. monetary aggregates and the Eurodollar volume and the various correlation coefficients. All correlation coefficients are negative, ranging from

1/ Cf. Davis (6, Chapter 4).

FIGURE 1

INTEREST RATES ON 3-MONTH U.S. CERTIFICATES OF DEPOSITS AND EURODOLLARS 1977



Source: *Federal Reserve Bulletin,* Table 1.36.
Weekly figures are averages of daily quotations for the week ending Wednesday.

-.10 to -.85. This suggests that during periods of monetary stringency (ease) in the United States, the Eurodollar market grew faster (slower), thereby partially offsetting the effects of monetary policy actions. In short, there is no evidence to support the assertion of the adherents of the portfolio approach that the offshore monetary growth rates are governed by domestic monetary expansion rates (4,5).

The third point to be considered is whether the monetary authorities of the countries whose currencies play an important role in the Euromarkets take developments in these offshore market into account when formulating their monetary policy. Here we must distinguish between various possible monetary policy targets and their implications for the offshore markets.

If the monetary authorities pursue an interest rate target, it is clear that the expansionary potential of the Eurodollar market--as well as the domestic money stock--is unlimited. In essence, the authorities will supply any quantity of money demanded by the world at the given interest rate.

If, however, the authorities pursue a monetary growth target, matters are more complicated. The precise definition of the monetary target becomes important under these circumstances.

In most industrialized countries, including France, Germany, Italy, Japan, and the United Kingdom, demand deposits held by foreign banks at domestic banks are not included in the definition of the money supply.1/ To the extent that these countries formulate and pursue monetary targets, changes in foreign bank deposits held at domestic banks do not influence the money supply data. Consequently, an outflow of money to an offshore bank will result at first in a reduction of the domestic money supply. As soon as the authorities observe this fall in the money supply, they will take actions to bring it back to the target level. That is, they will hold the domestic money supply constant, while the offshore money supply has increased.

At present, the United States includes foreign commercial banks holdings of demand deposits at U.S. commercial banks in the U.S. monetary aggregates.2/ That is, the U.S. monetary targets include money balances held by foreign banks along with domestic holdings of monetary assets by nonbanks. But there is good reason to believe that international objectives play only a very minor role in the monetary policy formulation process of the Federal Reserve. For instance, in connection with the increase in the U.S. discount

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1/ Cf. Promisel (12).

2/ Recently the Advisory Committee on Monetary Statistics has recommended the exclusion of these deposits held in the United States by foreign commercial and central banks from the U.S. money supply data. (Cf. Federal Reserve Bulletin, May 1976, p. 424.) At the time of this writing, no policy action had been taken on this recommendation.

date from 6 to 6 1/2 per cent on January 6, 1978, Arthur Burns "pointed out that this would be the first time in his eight years at the helm of the Fed. that he had advocated a boost in the discount rate for international reasons."1/

It is the view of the Federal Reserve that "normally, surpluses or deficits in the U.S. balance of payments, either because of the way they are financed or because of offsetting actions by the Federal Reserve, do not have a direct effect on the U.S. monetary base."2/ Regarding Eurodollar developments this statement is supported by the findings of a Federal Reserve staff paper which states that:

> "the Federal Reserve System has not given explicit consideration to the depositing and lending activities of the Eurobanks in its formulation of policy."3/

We may conclude that national monetary policies have not in the past constrained the growth of the Eurocurrency markets. Instead, Eurobanks have been and will in all likelihood continue to be able to attract any additional funds desired due to their competitive cost advantage. Furthermore, there is no effective constraint on the growth of the Eurobanks via stringency of reserve assets because Eurobanks do not hold reserve in the form of demand deposits at domestic commercial banks. From this it follows that we might expect that Eurobanks will be able to supply funds to all potential borrowers that they wish to accommodate. That is, the amount of Eurocurrencies in existence is for all practical purposes demand determined.4/5/

The role played by the Euromarkets in the recycling of the petrodollars is instructive in this respect. The Eurobanking system plays a major role in the recycling process without the need for action or accommodation on

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1/ The Washington Post, January 8, 1978, p. A2.

2/ The Federal Reserve System: Purposes and Functions (2, p. 95).

3/ Meulendyke (10, p. 29).

4/ There are certain parallels to this conclusion in the sphere of official international reserves. The Fund's 1977 Annual Report notes that "collectively, the system can generate reserves through the intermediation provided by banks and other private institutions," (p. 39), and the 1966 Annual Report finds that "a factor continuing to exercise a positive influence on the degree of reserve ease is the adaptability of the supply of reserves to the demand" (p. 41). That is, official international reserves are essentially demand-determined as well.

5/ Recently, Robert Aliber (3) has argued that the volume of Eurocurrencies in existence is supply determined. While it is undoubtedly true that both blades of the Marshallian scissors of supply and demand play a role, there is the question whether one of the two blades is essentially held still (or serves in an accommodating role) while the other one does the cutting. The fact that commercial banks are actively engaged in the marketing of Euroloans while they have seemingly little trouble to attract funds suggests that the supply of Eurofunds is more or less perfectly elastic and adjusts readily to any demand for Eurocurrencies that needs to be met.

behalf of central banks.[1] This recycling process was initiated and carried out by the private banking system without central bank stimulus. This is evidence for the elasticity of the Eurobanking system and shows its ability to make rapid and large adjustments in the volume of its assets and liabilities without apparent constraint due to countervailing monetary policies in the countries whose currencies are utilized.

There are two factors that may serve as constraints on the growth of the Euromarkets: the capital adequacy of the Eurobanks and the demand for Euroloans by creditworthy borrowers. The capital adequacy of a Eurobank represents a constraint on that bank's ability to attract funds. Clearly, this constraint is not operative in the case of offshore branches of very large commercial banks. In the case of independently operating Eurobanks the capital constraint is likely to be binding only in the short run. A well-run bank that wishes to expand its capital base because its business volume has increased will generally be able to find interested investors without difficulty. Hence, capital adequacy of Eurobanks is not likely to represent a binding constraint in the long run.

This leaves the demand for Euroloans as the factor determining the size of the Eurocurrency market. Prudent banking practices require that standards in the Eurobanking business equal or exceed those in the domestic banking business. One reason for this is that it is in general much more difficult to collect on international loans in default or to use legal proceedings to recover foreign losses. Sovereign borrowers are not subject to the jurisdiction of the courts in the bank's home country and even when the sovereign borrowers consent in advance to the jurisdiction of foreign courts, it may be difficult to enforce any judgments obtained. The enforceability of loan agreements made with private entities abroad may also be more limited than with domestic entities and hence it is not surprising that Euroloans are generally made only to prime borrowers.[2] On the other hand, it is true that prime foreign borrowers tend to have no difficulty in obtaining the funds they want through Eurobanks. That is, the volume of Euroloans is constrained only by the demand for funds on behalf of creditworthy borrowers. Given their competitive advantage, the Eurobanks are in a position to draw all the funds needed from international or domestic sources.

4. Some implications and possible solutions

Certain implications emerge from the analysis presented and the main conclusion that the volume of Eurocurrencies is essentially demand determined. It may be useful to list briefly the main implications. First of all it should be kept in mind that the Euromarkets greatly increase the ease with

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1/ Cf. the U.S. Senate Staff study on International Debt, the Banks, and U.S. Foreign Policy, Part III: Petrodollar Recycling and the Commercial Banks (13).

2/ Indeed, the loss experience in the Euromarkets has been generally more favorable than the domestic loss experience. Cf. Davis (6, p. 42) and the Federal Reserve study cited above.

which funds can be moved internationally. This contributes to a more efficient international allocation of resources and makes it easier to overcome international economic disturbances such as the oil price increase. However, the central banks of the countries whose currencies are used in the Euromarkets do not have complete control over the aggregate amount of monetary assets denominated in their currency. In view of the fact that the aggregate amount of monetary assets denominated in a currency plays an important role in determining its value vis-a-vis other currencies, a country's exchange rate may be influenced by developments in the offshore currency markets. Also, international inflationary pressures may be higher than they otherwise would be. Consequently, the Euromarkets present the classic dilemma between affording increased economic efficiency of resource allocation but decreased efficacy of monetary policy.

In searching for a solution to the dilemma posed by the existence of the Euromarkets, it may be useful to remind ourselves that there are three aspects to any banking relationship that are important for definitional, regulatory and economic policy purposes: the location of the bank, the country of residence of the customer, and the currency in which the transaction is carried out. In a purely domestic banking system the bank and the customer are located in the same country and the local currency is used in the transaction. In traditional international banking the customer and the bank are located in different countries and the currency of the bank's or the customer's home country may be used. In offshore or Eurobanking this last congruence is generally eliminated as well: the bank, the customer, and the currency may all have different "nationalities".

There are three principles that countries can follow in their statistical and regulatory practices: the currency principle, the bank location principle, and the customer residence principle. It will be shown that if all national monetary authorities follow the same principle no problems of noncoverage arise.

Under the currency principle the national authorities would include all assets (and liabilities) denominated in the country's currency in their relevant statistics and regulate all financial operations in their own currency on a worldwide basis. This guarantees a complete global statistical and regulatory coverage as the respective monetary authorities are responsible for all financial operations in their currency. Offshore markets are completely covered. Of course, the practical problems of implementing such a policy are great and would require a global accounting and regulatory network for each national monetary authority. This requirement would greatly increase costs and the cumbersome administrative machinery required might well render this approach impracticable.

The bank location principle subjects all banking operations carried out within a nation's borders to the statistical and regulatory authority of that nation. No global accounting network is required as each nation monitors only the activities of the banks located within its borders. While national monetary authorities do monitor the activities of banks resident

in their own country, banking involving foreign currencies and/or foreign customers is frequently exempt from regulatory control.1/ Consequently, the sum total of national statistical and regulatory efforts does not result at present in a comprehensive and nonduplicative coverage of world-wide banking activities.

The customer residency principle involves statistical and regulatory efforts based on the residency of ultimate (nonbank) borrowers and lenders. Currently, few countries have a reporting network that enables the monetary authorities to monitor the financial activities of its residents on a world-wide scale. The sheer magnitude of the reporting effort required makes this system also very difficult and costly to administer and the possibilities for evasion are manifold.

The problem of finding a consistent and useful set of definitions is compounded by the fact that the various concepts have differing degrees of usefulness for purposes of economic analysis. For instance, if one is interested in factors determining the exchange rate of a currency, it is important to have precise information about the quantity of that particular currency. Hence, the currency principle provides an attractive statistical and regulatory starting point. However, if one is interested in questions pertaining to bank liquidity and solvency, including the prudent management of country-risk exposure by banks, one may wish to focus on the banking principle. Finally, in questions related to national economic activity and its forecasting, much may depend on total currency holdings by residents, and hence the customer residency principle may be of particular interest.

In short, it is easy to see way divergent interests result in a statistical and regulatory framework that is less than ideal if one is interested in analyzing international economic problems from a global viewpoint. But even when considering monetary questions from a strictly national point of view, the existing framework makes it difficult to analyze and formulate solutions to certain economic questions and renders some economic problems more intractable than they otherwise would be. These costs must be considered--and if possible reduced--when we consider the economic benefits accruing to the world due to the increased economic and financial efficiency made possible by the existence of the Eurobanking system.

1/ Cf. U.S. Senate (13, p. 18).

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