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Treasurer's Department

The Level and Structure of Interest Rates  
on SDR-Denominated Financial Assets

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## I. Introduction

Following the greater degree of flexibility in exchange rates that developed in the early 1970s there emerged widespread interest in techniques of protecting the value of financial assets and obligations against losses arising out of unexpected exchange rate changes. The desire to minimize exchange risks without unduly sacrificing current yield in the new financial environment gave rise, inter alia, to greater attention to financial diversification by both official and private entities and the use of currency composites such as the SDR. <sup>1/</sup> The principal purpose of this paper is to present an analysis of developments in interest rates on SDR-denominated deposits (and bonds) including a description of their underlying determinants. Most of the interest rate information on SDR-denominated instruments applies to commercial bank term deposits. Since late 1978, information on interest rates on SDR-denominated deposits of up to 12-month maturity has been available from a number of commercial banks and the Bank for International Settlements (BIS). The availability of interest rate data on this range of maturities made it possible to analyze the information within the framework of term structure theory. The paper does not deal with the issue of the interest rate on the official SDR, which is administered by the Fund.

A limited market in SDR-denominated instruments emerged in 1974-75. In the period 1977-79 the U.S. dollar, the principal vehicle currency for international capital movements, came under heavy pressure and the exchange markets became uncertain and quite volatile. These characteristics of the exchange market created favorable conditions for familiarization with currency baskets like the SDR, and various internationally operating commercial banks seized the opportunity to offer SDR-denominated deposits with a favorable response from investors. Indeed, after a long period of depreciation of the dollar there was a significant increase in activity in the market from late 1978, including a number of issues of syndicated credits, and floating rate notes and bonds. The SDR-denominated markets received a further stimulus in 1981 when the Fund adopted a five-currency valuation system for the SDR and unified it with the interest rate basket. Since all the five currencies, unlike some of the previous 16 in the basket, are actively traded in major spot

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<sup>1/</sup> The issue of riskiness is discussed in "The Private SDR: An Assessment of its Risk and Return," IMF Staff Papers, March 1984.

and forward markets, it became easier to fund and/or cover SDR-denominated transactions. 1/

Types of instruments involved in the "private" SDR market, which is essentially part of the euro-market, include commercial bank deposits, syndicated credits, certificates of deposit, and floating rate notes and eurobonds. While private and semi-official institutions are heavily involved, there are also official participants in the private SDR market, for example, the Bank for International Settlements (BIS) accepts SDR-denominated deposits from the Fund in particular. Some central banks have been reported to have invested in SDR-denominated deposits, and some official institutions, such as the Nordic Investment Bank and the Swedish Investment Bank, have issued SDR-denominated bonds. The deposit part of the market is substantially larger than the other segments although the total level of SDR-denominated deposits outstanding remains rather small; at the end of 1981 they were estimated at SDR 5-7 billion but the market has reportedly shrunk since then. Liabilities of U.K. banks denominated in SDRs at the end of September 1984 amounted to SDR 1.4 billion or 0.22 percent of the total foreign currency position held by those banks. The aggregate face value of fixed- and floating-rate bonds quoted at

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1/ The present valuation of the SDR employs fixed units of the five component currencies, but the effective percentage shares of these currencies change over time as exchange rates change. This is illustrated below as at the end of December 1984.

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Currency	Currency units in the SDR	Percentage share at composition change <u>1/</u>	Percentage share at end-December 1984
U.S. dollar	0.54	42	55.1
Deutsche mark	0.46	19	14.9
Japanese yen	34.00	13	13.8
French franc	0.74	13	7.8
Pound sterling	0.071	13	8.4

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1/ Effective January 1, 1981 when the new five-currency valuation system was introduced. The percentage share has been calculated by applying the prevailing exchange rates on the currency units and normalizing the results to sum to 100.

the Luxembourg Stock Exchange was SDR 473 million in 1981-83 but has subsequently fallen to SDR 285 million at the end of 1984 as issues have matured. <sup>1/</sup>

The principal reasons for the recent reduction in activity in the private SDR market appear to have been the strength of the U.S. dollar on the exchange markets and high rates of interest on U.S. dollar-denominated financial assets motivating many investors to prefer straight U.S. dollar assets to SDR-denominated assets that are only partly U.S. dollar-linked, and successful promotion by the European Community of the ECU, an alternative currency composite consisting of solely European currencies. During the conference on the SDR held in the Fund in March 1983, it was noted that the composition of the SDR has been determined to meet the needs of the Fund and its members and that its use in private financial markets is clearly not its main function. On the other hand, the institutions of the European Community have taken an active role in furthering the use of the ECU as one manifestation of European integration. Banks have responded by recently developing a free interbank market in ECUs in which the unit does not have to be unbundled into its individual components and which, therefore, gives the ECU essentially the same liquidity as an individual currency.

## II. Guides to the Determination of Interest Rates on SDR-Denominated Instruments

In an environment where well-established market forces operate without constraints, buyer/seller bargaining determines the equilibrium price of a financial instrument irrespective of whether it has a fixed or floating coupon. Any investor can choose whether or not to accept the rates offered by banks on deposits and might also prudently specify a limit price when lodging an order for a bond. By an iterative market-clearing process based on the interaction of depositors and deposit takers (or buyers and sellers) an equilibrium interest rate appropriate for each point in time is reached. Both the issuers and buyers of financial instruments, however, can employ objective criteria by which to assess the appropriateness of the yield at a given point in time. For investments in single currencies, inflation expectations and the short-term effects of monetary policy may be very important such factors. In the private market for SDR-denominated financial assets, given its small size and the difficulty of assessing fundamentals for five separate currencies, indirect reference to a calculation formula

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<sup>1/</sup> For a discussion of institutional developments in private use of the SDR in financial markets, see Dorothy Meadow Sobol, "The SDR in Private International Finance," Quarterly Review, Federal Reserve Bank of New York, Winter 1981-82. See also, "The Private SDR and its Implications," Morgan Guaranty Trust Company, World Financial Markets, April 1981.

that combines interest rates for the SDR's component currencies is an especially important guiding mechanism. 1/

In determining appropriate interest rates on SDR-denominated deposits taken by commercial banks, the asset is usually viewed as a composite of fixed amounts of the five currencies (U.S. dollar, Deutsche mark, pound sterling, Japanese yen, and French franc) invested in the eurocurrency markets. For the computation of the interest rate, individual eurocurrency deposit rates can be applied to the fixed amounts of currency units and the proceeds converted by the current SDR exchange rates. This method is employed by the Fund to construct interest rate on the SDR and most of its SDR-denominated borrowings, but yields or rates on domestic instruments of appropriate maturities (rather than eurocurrency deposit rates) are employed for this purpose. 2/ This method, known as the combined market rate, can be summarized by the following formula: 3/

$$\text{SDRI} = \sum_{i=1}^5 \text{CU}_i * \text{ES}_i * \text{I}_i \quad (1)$$

where: SDRI is the SDR interest rate,  
CU is the currency units in the SDR,  
ES is the spot exchange rate against the SDR in SDR per  
currency unit, and  
I is the individual component interest rates.

An alternative method is to simulate the yield that would result from constructing an SDR-denominated investment through a base-currency investment by taking positions in the forward exchange market rather than in the deposit market for some or all of the other currency components in the SDR basket. In this case the interest rate can be derived by adjusting that on the vehicle currency for the prevailing

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1/ In the case of floating-rate SDR-denominated instruments, it is necessary to specify in advance in the prospectus the full details of the formula determining how the coupon will be periodically changed. The present market practice is to reset the coupon at a fixed margin over an average of SDR-denominated deposit rates of specific reference banks.

2/ It should be noted also that in applying this approach the Fund uses official SDR rates, which are based on representative exchange rates advised by members from their domestic exchange markets and which are recorded at different points in time, whereas in the private market the exchange rates used are "undeviated," i.e., recorded at the same time and place.

3/ Some descriptions of this method expand the number of computational steps involved by explicitly computing the percentage shares of each of the currencies in the value of the SDR at the time of the interest rate calculation.

percentage premia or discounts of the other component currencies against the vehicle currency. This method can be viewed as the same as the combined market rate with, however, the yield information derived indirectly from the forward exchange markets; it requires the existence of forward exchange quotations for the four other currencies against the base currency while the first method presupposes the existence of appropriate (comparable) instruments and, therefore, interest rate quotations for all the component currencies in the valuation of the SDR. This second formula can be expressed as follows:

$$SDRI = \sum_{i=1}^5 CU_i * ES_i * (I_{US} + FP_i) \quad (2)$$

where:  $I_{US}$  is the U.S. interest rate, and  
FP is the forward premia or discount against the U.S. dollar for the component currencies expressed in annual percentage terms.

In principle, in a perfectly arbitrated market these two formulas would produce the same interest rate. If the rates yielded by the two formulas differ from each other this would imply that trading in certain currencies would be more profitable in the money market than in the forward exchange market so that there would be shifts of funds from one market to the other until an equilibrium is established. In practice, however, these two methods yield slightly different interest rates because of market imperfections and differences in timing between the observations available on interest rates and those on forward exchange rates.

A further method that is popular among commercial banks in determining interest rates on SDR-denominated assets uses an outright forward exchange rate against the SDR. The rate SDRI can be defined as:

$$SDRI = \frac{\text{Interest in SDRs}}{\text{Principal in SDRs}} * 100$$
$$= \frac{(\text{Principal plus interest in SDRs}) - (\text{Principal in SDRs})}{(\text{Principal in SDRs})} * 100$$

Using the U.S. dollar as the basis this can be expressed as:

$$\frac{\frac{(\text{Principal in US\$}) (1 + R_{\text{US}}) - (\text{Principal in US\$})}{E_f} - \frac{(\text{Principal in US\$})}{E}}{\frac{(\text{Principal in US\$})}{E}} * 100$$

where:  $R_{\text{US}}$  is the U.S. interest rate (as a fraction, i.e.,  $I_{\text{US}}/100$ )  
 $E$  is the spot U.S. dollar/SDR rate.  
 $E_f$  is the forward U.S. dollar/SDR rate (on an annual basis).

This can be reduced to:

$$\text{SDRI} = \frac{(1 + R_{\text{US}})E}{E_f} - 1 \quad (3)$$

For practical implementation of this "outright forward" formula 1/ a value of the forward U.S. dollar/SDR rate is required. Some banks have been quoting forward SDR exchange rates but they can also be constructed in the same manner as spot SDR exchange rates. 2/

Solution of this formula for February 3, 1984, as an example gave 8.984 percent compared with 9.035 percent for the combined eurocurrency interest rate, using data consistent with covered interest parity. This

1/ The formula is occasionally referred to as the "Morgan formula" since it became popularized by the Brussels Branch of Morgan Guaranty Bank.

2/ Calculation of spot and forward exchange rates for the SDR is illustrated by the following example (as of February 3, 1984).

Currency	Currency amount (1)	Spot rate (2)	Forward rate (3)	Product	
				(1) * (2)	(1) * (3)
Deutsche mark	0.46	0.36357	0.37690	0.16724	0.17337
French franc	0.74	0.11843	0.11283	0.08763	0.08349
Japanese yen	34.00	0.004279	0.0044121	0.14549	0.15001
Pound sterling	0.071	1.425	1.4283	0.10118	0.10141
U.S. dollar	0.54	1.0000	1.0000	<u>0.54000</u>	<u>0.54000</u>
			Sum:	1.04154	1.04828

The U.S. dollar/SDR forward rate is \$1.04828 per SDR.

calculation used theoretical forward exchange rates constructed from the eurocurrency interest rate differentials rather than actual forward premia/discounts observed in the markets to remove the influence of imperfectly arbitrated market information on this comparison. The difference (0.051 percentage point or nearly 1/16th) is due to the fact that high interest rate currencies, under covered interest parity, are at discounts (the spot rate is expected to depreciate) and consequently these currencies make up a lower percentage share of the basket when forward exchange rates are applied to the fixed currency units. <sup>1/</sup> It is interesting to note that this formula gives the same rate as would be generated by replacing the spot exchange rates in the combined market rate formula by forward exchange rates.

### III. Interest Rates on SDR-Denominated Deposits

This section analyzes the features of interest rates on SDR-denominated deposits and some factors underlying the movements in the rates. A comparison with weighted composites of the eurocurrency rates is then undertaken since an investor can make up an SDR weighted portfolio by appropriate investments in individual eurocurrency deposits of the five SDR basket components. This comparison may provide indications of whether the level and structure of the rates on SDR-denominated deposits can have "lives of their own" independent from an appropriately weighted average of eurocurrency rates. The last subsection compares the actual bank deposit rates with the five individual eurocurrency deposit rates.

#### 1. Some general features of the term structure of interest rates

The relationship between interest rates over various maturities is generally considered to be determined by two main factors: expectations about future trends in short-term interest rates and the premium for risk exposure (or illiquidity) that a borrower must pay a lender to

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<sup>1/</sup> This comparison is given below for some other randomly selected dates. It can be noted that the difference between the two methods will be greater when there are marked differences in the component interest rates; if all five component interest rates were the same, the two methods would give the same solution for the appropriate SDR interest rate.

<u>Date</u>	<u>Combined market rate</u>	<u>Outright forward formula</u>	<u>Difference</u>
January 21, 1983	9.351	9.219	0.132
May 19, 1983	8.563	8.510	0.053
February 3, 1984	9.035	8.984	0.051
November 20, 1984	8.745	8.717	0.028

induce the lender to extend maturity past the preferred future point in time. If short-term rates are expected to stay stable, the long-term rate will stand above the short-term rate only by the amount of any risk premium displaying a "normal" yield curve. If short-term rates are expected to rise then the long-term rate will stand higher than the short-term rate in order to reflect the expected average yield that could be obtained from a succession of short-term investments, plus the risk premium. Similarly, if short-term rates are expected to fall then long-term rates will stand below the short-term rate, if the additional impact of any risk premium is not taken into account.

A third factor that may be of some importance to the type of term structure analyzed in this paper is the additional flexibility provided to an investor in deposits of shorter maturity by the early interest payment received in comparison with longer-term investments on which coupon payments are generally made semiannually or annually. To the extent that this reinvestment flexibility and potential interest compounding is valued by the investor, the interest rates on short-term deposits would be slightly lower than would otherwise be the case.

Underlying these factors that would affect principally the maturity structure of interest rates, a major element of the level of market-determined, rather than administered or controlled, interest rates is considered to be compensation for the expected erosion of purchasing power of the principal, i.e., an expected inflation component. It is also usually argued that there is an additional component of about two or three percentage points representing a real rate of return corresponding to the rate of time preference, i.e., reward for deferred consumption opportunities. In addition, for short-term rates some random movements may be generated by unexpected events, especially monetary "shocks" (which might include such elements as fiscal or exchange policy developments with immediate monetary implications). These shocks should affect longer-term rates less than shorter-term rates as the shocks are expected to show a random pattern; nonrandom monetary movements could be assumed to contribute to a change in inflationary expectations and the perceived course of future short-term interest rates.

## 2. Interest rates on SDR-denominated deposits

Interest rates on SDR-denominated deposits for the period January 1979 to December 1984 are given in Table 1. These are averages of indicative bid quotations offered by a number of commercial banks. <sup>1/</sup> The maturities for which quotations are available are confined to a range from one month to one year. This limited range of maturities for which the rates are quoted makes it uncertain that empirical evidence of

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<sup>1/</sup> The quotations includes those of the BIS up to June 1981. The number of banks reporting the information varied from three in the early months to as many as 16 at other times.

Table 1. Interest Rates on SDR-Denominated Deposits, 1979-84 1/

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1979</u>	Jan.	7.52	8.08	8.35	8.29	1.110	1.102
	Feb.	7.66	8.09	8.44	8.47	1.101	1.106
	Mar.	7.85	8.25	8.44	8.44	1.075	1.075
	Apr.	8.03	8.52	8.81	8.88	1.097	1.106
	May	8.62	8.85	9.08	9.13	1.053	1.059
	June	8.76	9.16	9.23	9.08	1.054	1.037
	July	9.62	9.89	9.91	9.65	1.030	1.003
	Aug.	9.99	10.53	10.59	10.23	1.060	1.024
	Sept.	10.39	10.93	10.94	10.55	1.053	1.015
	Oct.	11.79	12.66	12.61	11.77	1.070	0.998
	Nov.	11.31	12.11	12.05	11.22	1.065	0.992
	Dec.	11.92	12.42	12.40	11.39	1.040	0.956
<u>1980</u>	Jan.	12.37	12.64	12.60	12.12	1.019	0.980
	Feb.	12.79	13.94	14.08	13.62	1.101	1.065
	Mar.	14.92	15.61	15.62	14.83	1.047	0.994
	Apr.	12.51	12.80	12.43	11.61	0.994	0.928
	May	10.69	11.19	10.96	10.53	1.025	0.985
	June	11.67	11.46	11.09	10.50	0.950	0.900
	July	10.66	10.82	10.70	10.37	1.004	0.973
	Aug.	11.33	11.97	12.00	11.69	1.059	1.032
	Sept.	12.09	12.56	12.60	12.30	1.042	1.017
	Oct.	12.48	12.98	12.85	12.36	1.030	0.990
	Nov.	13.58	13.98	13.59	12.95	1.001	0.954
	Dec. <u>2/</u>	13.01	12.66	12.38	12.27	0.952	0.943
<u>1981</u>	Jan.	13.80	13.58	13.22	12.73	0.958	0.922
	Feb.	13.23	13.89	13.67	13.25	1.033	1.002
	Mar.	12.04	12.47	12.45	12.35	1.034	1.026
	Apr.	13.27	13.54	13.58	13.24	1.023	0.998
	May	15.47	15.49	14.93	14.31	0.965	0.925
	June	15.04	15.15	14.94	14.41	0.993	0.958
	July	15.40	16.01	15.98	15.20	1.038	0.987
	Aug.	16.30	16.49	16.20	15.41	0.994	0.945
	Sept.	16.32	16.41	16.33	15.49	1.001	0.949
	Oct.	13.56	14.36	14.63	14.54	1.079	1.072
	Nov.	11.49	11.84	12.07	12.17	1.050	1.059
	Dec.	12.23	12.69	13.36	13.25	1.092	1.083
<u>1982</u>	Jan.	13.14	13.29	13.41	13.42	1.021	1.021
	Feb.	12.52	12.71	12.84	12.85	1.026	1.026
	Mar.	14.26	13.91	13.67	13.31	0.959	0.933
	Apr.	13.17	13.28	13.18	12.88	1.000	0.978
	May	14.25	13.79	13.42	13.03	0.942	0.914
	June	13.03	13.30	13.51	13.48	1.037	1.035

Table 1 (concluded). Interest Rates on SDR-Denominated Deposits, 1979-84 <sup>1/</sup>

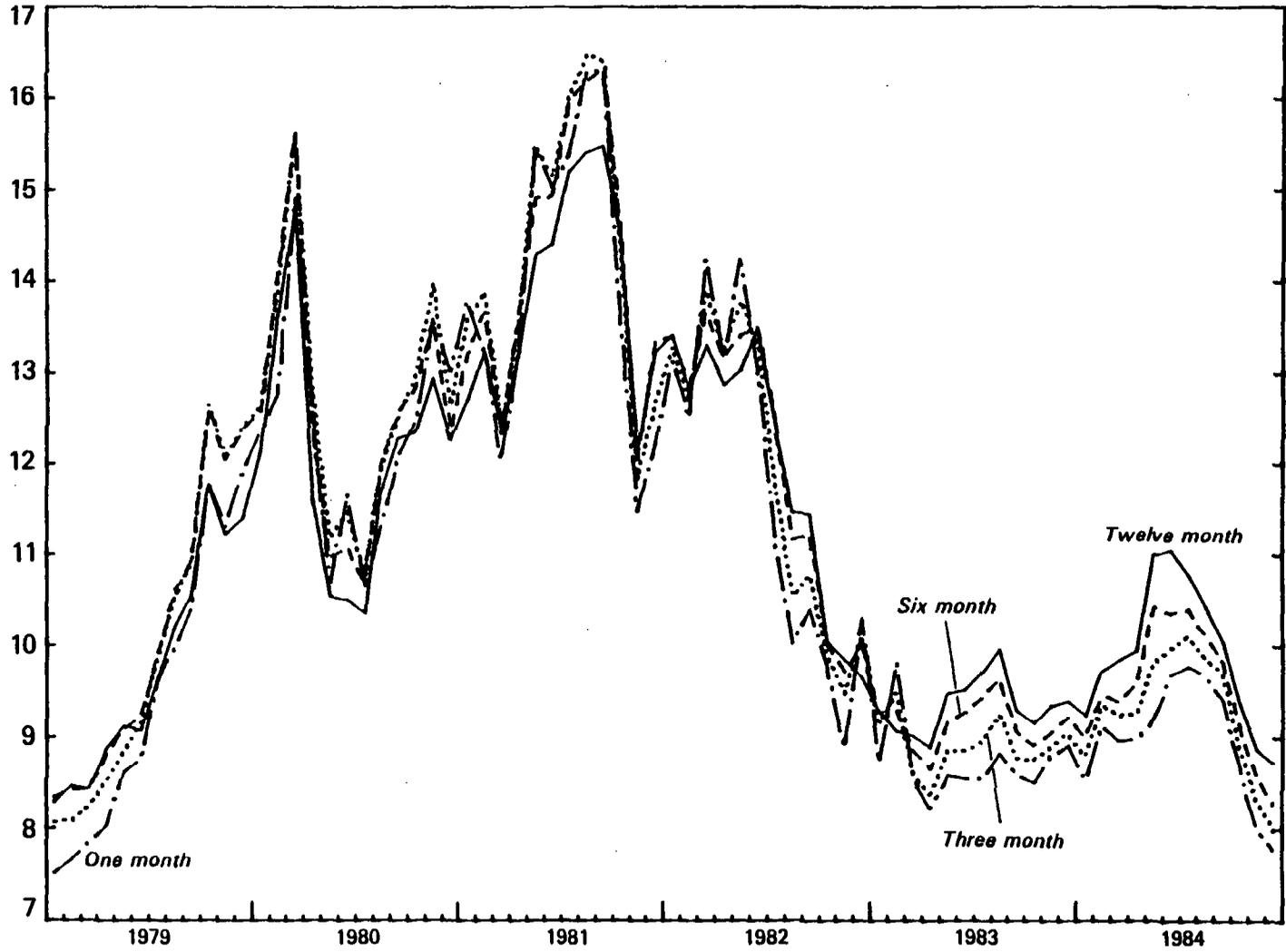
		One-month	Three-month	Six-month	One-year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1982</u>	July	11.11	11.77	12.46	12.45	1.122	1.121
	Aug.	10.03	10.55	11.18	11.47	1.115	1.144
	Sept.	10.41	10.79	11.23	11.45	1.079	1.100
	Oct.	9.76	9.90	10.02	10.06	1.027	1.031
	Nov.	8.89	9.49	9.73	9.84	1.094	1.107
	Dec.	10.31	10.11	10.01	9.66	0.971	0.937
<u>1983</u>	Jan.	8.74	9.16	9.28	9.27	1.062	1.061
	Feb.	9.82	9.49	9.31	9.07	0.948	0.924
	Mar.	8.56	8.58	8.86	9.02	1.035	1.054
	Apr.	8.22	8.39	8.66	8.90	1.054	1.083
	May	8.59	8.88	9.19	9.48	1.070	1.104
	June	8.55	8.86	9.27	9.52	1.084	1.113
	July	8.56	8.96	9.44	9.71	1.103	1.134
	Aug.	8.83	9.26	9.65	9.96	1.093	1.128
	Sept.	8.59	8.78	9.07	9.30	1.056	1.083
	Oct.	8.51	8.76	8.91	9.16	1.047	1.076
	Nov.	8.80	8.90	9.06	9.35	1.030	1.063
	Dec.	8.91	9.05	9.23	9.40	1.036	1.055
<u>1984</u>	Jan.	8.54	8.80	9.01	9.25	1.055	1.083
	Feb.	9.14	9.36	9.46	9.72	1.035	1.063
	Mar.	8.97	9.25	9.40	9.84	1.048	1.097
	Apr.	8.99	9.27	9.61	9.95	1.069	1.107
	May	9.22	9.83	10.44	11.00	1.132	1.193
	June	9.69	9.98	10.36	11.06	1.069	1.141
	July	9.77	10.11	10.41	10.79	1.066	1.104
	Aug.	9.67	9.86	10.11	10.44	1.046	1.080
	Sept.	9.41	9.71	9.83	10.05	1.045	1.068
	Oct.	8.67	8.87	9.11	9.39	1.051	1.083
	Nov.	8.01	8.33	8.56	8.86	1.069	1.106
	Dec.	7.78	7.99	8.28	8.72	1.064	1.121
Average:		10.88	11.19	11.28	11.16	1.037	1.026
Standard deviation:		2.36	2.35	2.21	1.95	--	--
Coefficient of variation:		0.217	0.210	0.196	0.175	--	--

Source: International Monetary Fund, Treasurer's Department.

<sup>1/</sup> Average of quotes by certain commercial and other banks, Wednesday nearest end of month. Average excludes the BIS from July 1981.

<sup>2/</sup> Rates are for January 7, 1981.

CHART 1  
SDR-DENOMINATED DEPOSIT INTEREST RATES FOR  
VARIOUS MATURITIES 1979-84





all the theoretical underpinnings of the interrelationships between these rates can be isolated. Although various banks quoting the rates are assumed to base their quotations on the same basic principles, there are often sizable differences between the rates quoted by different banks. <sup>1/</sup> These differences reflect timing differences but could in part also reflect divergent views amongst the banks as to the desirability and/or prospect for obtaining deposits. It should be remembered, therefore, that the following analysis is undertaken on the basis of the averages of the rates quoted by the banks.

As can be seen from Table 1, the level of these rates has shown considerable fluctuation over the period 1979-84. The rates rose strongly during 1979 and the first quarter of 1980 then eased somewhat through the middle of 1980 before firming again to reach another peak in the third quarter of 1981. While the rates eased over the fourth quarter of 1981, they fluctuated about a basically flat level in the first half of 1982 until easing again to November 1982. After a notable upsurge in the shorter-term rates in December 1982 the rates then showed a generally steady level to January 1984 before rising another peak in July 1984 after which the rates eased quite markedly to levels similar to those in effect at the start of the period. The average rate across all the maturities given in Table 1 was 11.13 percent. The lowest rate recorded during the period was 7.52 percent (one-month for January 1979) while the highest rate was 16.49 percent (three-month for August 1981) showing that even "basket-based" rates can display considerable fluctuations (see Chart 1).

As can be seen from the ratio of the one-year rate to the one-month rate in the last column of Table 1, the shape of the yield curve has also varied considerably over time, starting and finishing the period upward-sloping but showing considerable variations in between. The one-year rate has ranged from being 19.3 percent higher than the one-month rate (at the end of May 1984) to 10 percent below (in June 1980), a variation which offers some prospect that certain aspects of term structure analysis may be appropriately applied to these rates. The following analysis focuses first on the average shape of the yield curve and the level of these rates over the period as a whole. Changes over time and the possible influences causing such changes are discussed later.

With respect to the yield curve displayed on average (the average of the 72 observations for each maturity are given at the bottom of Table 1), the peak rate was at the six-month maturity, followed by the three-month maturity. For a "normal" curve the average yield curve would be expected to slope upward to the one-year maturity.

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<sup>1/</sup> For example, the range of one-month rates quoted by eight commercial banks in mid-October 1982 ranged from 9.47 percent to 9.75 percent while for the one-year maturity the quotes ranged from 10.05 percent to 10.25 percent.

The tendency for the one-year rate to be below the three- and six-month rates here may imply optimism about declining inflation trends past the short-run (although it may also reflect the relative thinness of the market beyond the six-month maturity). To investigate this point, Table 2 gives inflation expectations data for the five major countries whose currencies are in the SDR basket. These are available for two time horizons: over the period of the next six months and the period seven to twelve months ahead. <sup>1/</sup> The weighted average inflation expectation over the former horizon was 6.60 percent, while over the latter horizon it was 6.39 percent. The difference, 0.21 of a percentage point, is somewhat larger than the 0.12 percentage point difference in the average six-month and one-year SDR-denominated deposit rates. Adjusted for inflation expectations, it appears, therefore, that the one-year rate averages slightly more than the six-month rate, but is not significantly above it.

The "normal" yield curve shape seems to prevail at the short end of the spectrum up to the six-month maturity. The six-month rate was higher than the one-month rate for 57 out of 72 months (79 percent of occasions) and it was above or equal to the three-month rate for 48 months. A major reason for this "normal" shape for the shorter maturities is the interest compounding effect. A one-month investment yielding the average one-month rate of 10.88 percent per annum in Table 1, with interest and principal reinvested at the start of each ensuing month at the same rate, would earn the same amount of interest over six months as a six-month deposit at 11.13 percent per annum. The actual average six-month rate was higher than this at 11.28 percent but the margin of 0.15 percentage point is not large. The three-month rate compounded for six months rises from 11.19 percent to 11.35 percent, which is slightly higher than the six-month rate.

Thus, allowing for these two factors (apparent expectation of declining inflation past the one- to six-month period and the interest compounding factor for the shorter-term rates), the SDR-denominated yield curve on average shows only a slight tendency to rise with maturity and appears to have been remarkably flat. Any risk premium in this whole spectrum of rates may, therefore, be effectively constant across maturities, rather than rising with maturity, since all the maturities are relatively short-term in relation to the term structure theory. This does not mean, however, that the risk premium was constant over time. Indeed, over the period considered here, significant changes in the real rate of interest on these deposits, which might include an element of risk premium, may have been caused by factors such as weakly-held and changing market perceptions of the permanence of tightened monetary policies and/or increased uncertainties about future inflation.

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<sup>1/</sup> These expectations are official forecasts of GNP deflators as published by the OECD and may not be identical to expectations formed by money market participants. They are convenient for the present analysis because of their coverage, the regular segments of time projected and regular revisions.

Table 2. Expected Inflation Rates

	Six-month inflation forecast made immediately prior to each half year												
	1979		1980		1981		1982		1983		1984		1985
	I	II	I	II	I	II	I	II	I	II	I	II	I
United States	7.0	9.5	10.0	10.5	11.0	7.0	8.0	5.0	6.00	4.75	5.0	4.50	4.25
Germany	3.0	3.0	4.5	4.5	4.0	3.5	3.0	3.0	2.75	3.25	2.75	2.50	2.25
United Kingdom	9.75	13.25	14.0	17.5	13.0	12.5	8.75	7.75	5.50	5.5	5.5	5.25	4.5
France	8.5	8.75	11.25	12.0	11.25	11.5	14.0	13.50	10.00	9.00	7.50	6.75	6.75
Japan	4.5	5.0	5.5	7.0	4.25	5.5	5.0	3.25	3.50	1.75	1.5	1.75	2.0
Weighted average <u>1/</u>	6.45	8.09	9.05	9.96	9.13	7.36	7.50	5.76	5.50	4.74	4.21	4.15	3.93
	Inflation forecast made immediately prior to each half year for seven-twelve months ahead												
	1979		1980		1981		1982		1983		1984		1985
	I	II	I	II	I	II	I	II	I	II	I	II	I
United States	7.0	9.25	9.5	9.75	10.0	8.25	7.25	5.75	5.50	5.00	5.5	5.0	3.25
Germany	3.75	2.5	3.75	3.5	3.25	3.5	2.75	2.50	3.00	2.25	2.50	3.0	2.0
United Kingdom	8.5	13.0	14.0	14.75	12.0	9.25	8.0	7.75	5.00	6.25	5.25	5.0	4.5
France	7.75	9.0	12.25	11.25	9.5	11.75	13.75	14.00	8.50	8.25	6.50	6.0	6.0
Japan	5.0	6.5	5.75	6.0	5.0	4.25	4.0	4.25	3.50	2.25	1.75	2.0	2.0
Weighted average <u>1/</u>	6.41	8.06	8.83	8.89	8.30	7.41	6.88	6.18	5.08	4.69	4.57	4.38	3.34

Source: OECD Economic Outlook, projections of GNP deflators.

1/ Weights used are: United States 0.45, Germany 0.19, United Kingdom 0.12, France 0.12, and Japan 0.12. These weights are only approximations to each currency's share in the SDR as these implicit percentage shares have fluctuated with exchange rate movements over time.

To investigate this possibility the real 12-month interest rate was estimated and found to average a relatively high 4.77 percentage points. <sup>1/</sup> Furthermore, the rate was much lower than the average in 1979-80 and much higher than the average in 1981-82. The average level and particularly those in 1981 and 1982 were significantly higher than the conventional notion that the real interest rate would in normal market conditions be about three percentage points. This may reflect that there was a significant, and time-varying, risk premium embodied in the rate structure even though the risk might have been stable across maturities. The "high" level of the average real rate may also, however, indicate a degree of optimism by government officials about inflation embodied in the OECD forecasts given in Table 2 relative to views of most market participants, but even so, the variability of the real rate is notable.

Finally in the analysis of the general features of these interest rates over the period 1979-84, a possible test of the existence and impact of monetary-type random shocks on short-term rates of different maturities is to examine the coefficients of variation of the rates for different maturities; these are given at the bottom of Table 1. These statistics show that volatility declines in an even progression as maturity increases, which is consistent with the idea that the effects of temporary shocks, especially monetary ones, are likely to affect short-term rates more than longer-term ones.

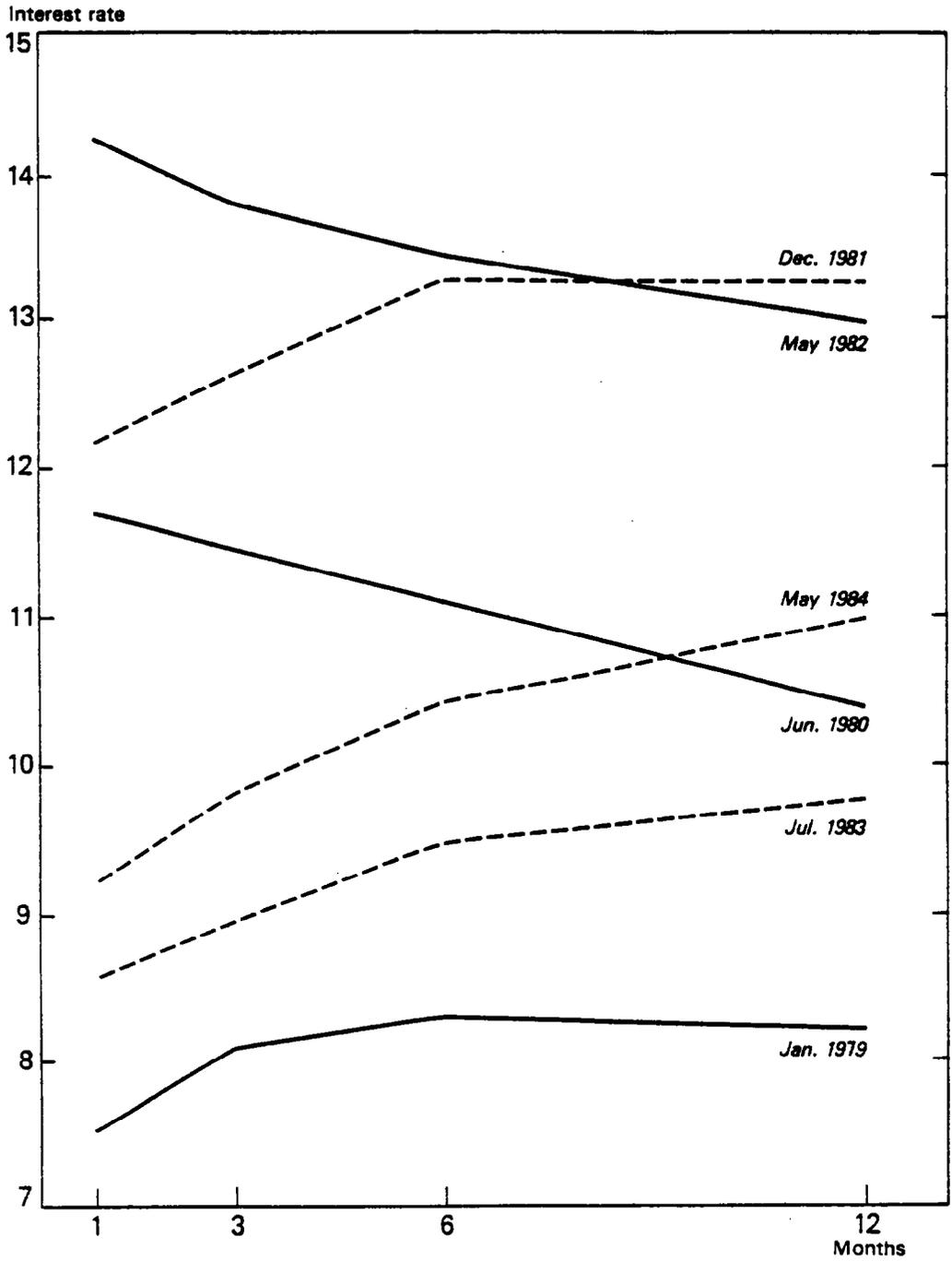
The major forces affecting these deposit rates can also be seen at work with respect to the evolution of the yield curve over time. The curve was noticeably upward-sloping in the first half of 1979 (the yield curve in January 1979 and at some other key dates is shown in Chart 2) during which time inflationary expectations in the United States, the United Kingdom, and to a lesser extent, Japan, were revised noticeably upwards (see Table 2). In the second half of 1979

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<sup>1/</sup> The expected real rates of return on SDR-denominated deposits can be derived by adjusting nominal rates by the expected inflation rates in the countries whose currencies comprise the SDR basket. We have estimated this real rate using the 7-12 months' inflation expectation and averaging the difference between this series and the 12-month SDR-denominated deposit rates. The details are as follows:

<u>Year</u>	<u>Average 12-month SDR deposit rates</u>	<u>Inflation expectations</u>	<u>Real SDR deposit rate</u>
1979	9.76	7.77	1.99
1980	12.10	8.67	3.43
1981	13.86	7.53	6.33
1982	11.99	6.05	5.94
1983	9.34	4.77	4.57
1984	9.92	4.10	5.82
1979-84	11.16	6.39	4.77

CHART 2  
YIELD CURVES  
SDR-DENOMINATED DEPOSITS  
AT DIFFERENT POINTS IN TIME





inflation expectations for all five major countries were further increased and interest rates on the SDR-denominated deposits continued to rise, especially on one- to six-month maturities. In 1980, inflation expectations peaked and then declined, the level of interest rates generally stabilized and the structure of the yield curve flattened out. By mid-1981, inflationary expectations had been revised sharply downwards to a weighted average level of about 7.4 percent but this change was not apparently reflected in the level of July-September deposit rates. This may have been due to the high level of uncertainty in U.S. financial markets (which would imply an increased risk premium) and unusually high yields obtainable for French franc eurodeposits in comparison with domestic rates, probably due to anticipation of policy actions such as devaluation or the imposition of exchange controls--a monetary-type shock that would affect short-term rates especially. In the October-December 1981 period, the SDR-denominated deposit rates fell sharply, especially for short-term rates, to closer proximity with inflation expectations, and the yield curve became moderately upward-sloping. In the first six months of 1982, with markedly declining inflationary expectations, the yield curve flattened and became downward-sloping (consistent with changed expectations of lower short-term interest rates in the future) but the overall level of rates remained high and it was not until the second half of 1982 that the overall level of the rates eased sharply in conformity with the trend of inflation expectations. In 1983-84, inflation expectations continued to decline but the SDR-denominated interest rates tended to fluctuate around a fairly stable and relatively high level until falling markedly in the last quarter of 1984. It can also be noted that the inverted yield curve case in February 1983 appears to have been in association with money market intervention by the French authorities ahead of the EMS parity realignment that took place in March of that year.

It can be concluded from the above discussion that the impact of inflationary expectations and short-term monetary-type shocks on changes in the level and structure of SDR-denominated interest rates appear to have been quite strong over the period studied. A significant underlying real rate of interest throughout the period was also evident but the estimate of the exact size of the hypothetically constant long-run component of this real rate is somewhat confused by the possibility that the inflation expectations data (being official forecasts) might have been more optimistic than expectations formed by market participants, and by the fact that the period included years, such as 1981 and 1982, during which risk premiums may have been unusually large. The data here, however, are consistent with the possibility of a real long-term interest rate of about three percent. There was, on the other hand, no strong evidence of a risk premium that is significantly rising with maturity for these interest rates, probably because the maturity range is rather narrow.

### 3. Comparison with a composite of eurocurrency interest rates

For an investor in the euro-markets an SDR-denominated deposit could be considered broadly equivalent to deposits of appropriate amounts in individual eurocurrencies matching the SDR basket. Consequently, deposit rates offered on direct SDR-denominated deposits should be very close, if not equal, to the sum of returns converted into terms of the SDR on individual deposits in amounts that comprise the SDR, after allowing for transactions costs. Table 3 compares end-of-month SDR-denominated deposit rates against such a (current spot exchange rate) composite of eurocurrency deposit rates for the three years following the introduction of the new five-currency basket for the SDR at the beginning of 1981. As can be seen, the calculated combined market eurocurrency rates differ rather unsystematically from the SDR-denominated deposit rates. There are significant timing differences between the determination of the SDR-denominated deposit rates and the combined eurocurrency rates which would explain a part of these differentials, but over the period of three years on average the SDR-denominated deposit rates are clearly lower; the average margin is a little more than one-eighth of a percentage point.

Three possible technical reasons can be advanced for these differences. First, it should be remembered that the SDR-denominated rates are the average of bid quotes largely for information purposes rather than the actual rates on which trading takes place and could be marginally lower than actual dealing rates, e.g., a bank may round downwards to the nearest eighth of a percentage point to protect itself against the possibility that market conditions move adversely at the time the deposit would actually be made. In addition, some of the banks use formulas for determining their rates using forward exchange rates that produce slightly lower SDR interest rates than methods that employ spot exchange rates for weighting the components. Thirdly, transactions costs will play a small part; a bank dealing in SDR-denominated deposits usually has added costs compared with dealing in a single national currency, since the proceeds of SDR-denominated deposits are usually reinvested in individual currencies.

The lower SDR-denominated deposit rates may also reflect an implicit market view that an SDR-denominated deposit has a value as a composite unit greater than the weighted sum of its parts. Such an independent "life of its own" is, however, not likely to be substantial given the relative ease of arbitrage in the deposit and currency markets for the currencies contributing to the valuation of the SDR. Competitive forces could be expected to bid up the SDR deposit rates until only transactions costs contributed to the differences. 1/

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1/ In the case of the ECU, which is a more complicated composite and less easily arbitrated, the deposit rates could have some significant independent movements for periods of time.

Table 3. Differences Between Combined Eurocurrency Rates and Quoted SDR Deposit Rates <sup>1/</sup>

		Maturity			
		One-month	Three-month	Six-month	One-year
<u>1981</u>	Jan.	-0.1960	-0.0174	0.0534	0.1905
	Feb.	1.1450	0.2992	0.3230	0.3135
	Mar.	0.7578	0.3557	0.3364	0.3788
	Apr.	0.8105	0.3430	0.3757	0.3286
	May	-0.1692	-0.3700	-0.2347	-0.1001
	June	0.7756	0.3500	0.1573	0.0478
	July	0.4798	0.0226	0.0759	0.1804
	Aug.	0.2428	0.0064	0.1289	0.2354
	Sept.	-0.0788	0.0697	0.1398	0.2447
	Oct.	0.0017	-0.0796	0.0306	0.2200
	Nov.	0.2872	0.1061	0.1469	0.2431
	Dec.	0.1315	0.0624	0.1057	0.1240
		Average	0.3490	0.0960	0.1370
<u>1982</u>	Jan.	-0.6338	-0.3856	-0.1618	-0.1489
	Feb.	0.1102	0.2592	0.3213	0.3309
	Mar.	0.1861	-0.1268	-0.0515	0.1390
	Apr.	0.3045	0.1906	0.2198	0.1273
	May	-0.2809	-0.0297	0.0460	0.3779
	June	0.0159	0.0821	0.1181	0.2335
	July	0.0307	-0.0010	-0.2334	0.0694
	Aug.	0.9498	1.1873	0.7972	0.5508
	Sept.	0.0375	0.0571	0.0272	-0.0356
	Oct.	0.1136	0.1325	0.1160	0.1343
	Nov.	0.9549	0.5996	0.5322	0.4925
	Dec.	-0.5306	-0.2173	-0.1601	0.0398
		Average	0.1050	0.1390	0.1170
<u>1983</u>	Jan.	0.2939	0.3913	0.4218	0.3607
	Feb.	-0.5019	0.0272	0.2961	0.1631
	Mar.	0.0436	0.1527	0.0961	0.1942
	Apr.	0.0990	-0.0320	-0.0759	-0.0084
	May	-0.1185	-0.1528	-0.1200	-0.0933
	June	0.0457	0.1141	0.0671	0.0893
	July	0.1558	0.1457	0.1705	0.1921
	Aug.	0.1147	0.1020	0.1707	0.1670
	Sept.	0.1132	0.1452	0.1049	0.1428
	Oct.	0.0544	0.0283	0.0198	0.0759
	Nov.	0.1406	0.1016	0.1305	0.1441
	Dec.	-0.2652	-0.2107	-0.1828	-0.0815
		Average	0.0150	0.0680	0.0920

<sup>1/</sup> Combined rate minus quoted SDR deposit rate.

The SDR-denominated deposit rates were also compared with a combination of the eurocurrency rates by regressing them on the component eurocurrency rates using the 1979-84 monthly data. A priori, the expectation would be that the coefficients on the individual "explanatory" factors would resemble the relative contribution of the individual currencies in the SDR valuation basket on average over the period; somewhere between the percentages given in footnote 1 on page 2, except for the fact that the valuation of the SDR in 1979-80 was based on a 16-currency basket in which the share of the U.S. dollar was constrained to 33 percent. As can be seen in Table 4, the degree of explanation is quite high but not perfect, although it increases as maturity rises and the volatility of the SDR-denominated interest rates falls. The sum of the coefficients for the five explanatory variables is slightly less than 1.00 for all four maturities. The coefficients for the U.S. dollar and Japanese yen deposit rates, however, are a little lower than might have been expected from the percentage share of each of those currencies in the SDR in recent years, while those for Deutsche mark deposit rates for the three-month to one-year maturity and the French franc deposit rates for the one-month maturity are somewhat higher than expected. This lower than expected estimate of the average contribution of the eurodollar rates may reflect greater short-term and/or cyclical variability of the exchange rate for the U.S. dollar over the period, implying greater variability around the mean of its implicit percentage share in the SDR basket. These results help to reinforce the point that for periods of marked changes in exchange rates such as occurred during the period under study here, a fixed percentage weight approach to the assessment of appropriate interest rates on SDR-denominated instruments might not be consistent with the method of valuation of the SDR. Constant terms added to these regressions made little difference; the constants were not significantly different from zero.

Table 4. Regression Results Explaining SDR-Denominated Deposit Interest Rates; January 1979-December 1984

Maturity for dependent variable	Coefficients on explanatory variables: euro-currency deposits rates for 1/					Test statistics	
	United States	Germany	United Kingdom	France	Japan	R <sup>2</sup>	D.W.
1. One-month	0.416 (18.0)	0.161 (4.9)	0.125 (6.0)	0.143 (15.6)	0.111 (4.5)	0.974	1.92
2. Three-month	0.420 (20.5)	0.232 (8.7)	0.126 (6.8)	0.118 (15.8)	0.096 (4.4)	0.984	1.79
3. Six-month	0.426 (19.7)	0.229 (8.5)	0.115 (6.5)	0.117 (15.5)	0.107 (4.9)	0.986	1.67
4. One-year	0.443 (22.0)	0.214 (9.4)	0.102 (6.7)	0.114 (17.1)	0.115 (5.7)	0.990	1.25

1/ T-values in parentheses.

Although the SDR-denominated deposit rates do not exactly replicate the combined eurocurrency deposit rates as indicated above, they are much closer on average to those rates than to combined domestic money market rates. As shown in Table 5 which gives data for the period 1981-83, the domestic money market average is substantially lower than the quoted SDR-denominated deposit rates. <sup>1/</sup> The main reason for the lower domestic rates is mainly institutional factors that prevent or discourage arbitrage between domestic interest rates and eurocurrency deposit rates. In addition, the former rates are largely those on government instruments or are central bank regulated while the latter rates are relatively free from domestic regulatory constraints and are claims on private institutions having a higher credit risk factor.

4. Comparison with individual eurocurrency deposit rates

A comparison of the SDR-denominated deposit rates with individual eurocurrency deposit interest rates for the U.S. dollar, the pound sterling, the Deutsche mark, the French franc, and the Japanese yen (see Appendix Tables 1-5 and the summary Table 6) <sup>2/</sup> shows in general a greater variability for the individual eurocurrency rates than the SDR-denominated deposit rates in terms of both the coefficient of variation at each maturity and the range of shapes displayed for the term structure as measured by the ratio of one-year to one-month rates. <sup>3/</sup>

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<sup>1/</sup> The comparison in this case excludes the one-month maturity because published domestic yields on official instruments on a consistent basis do not exist for this maturity.

<sup>2/</sup> The eurocurrency deposit rates, like the SDR-denominated deposit rates in Table 1, are bid rates; offered rates are higher, in normal circumstances typically by an eighth of a percentage point.

<sup>3/</sup> This conclusion can also be shown by the low-high spread across all maturities over the entire period for the individual eurocurrency deposits:

<u>Eurocurrency</u>	<u>Interest rate spread</u>	<u>Highest rate/ lowest rate</u>
U.S. dollar	8.38-19.69	2.35
Deutsche mark	3.50-14.87	4.25
Pound sterling	8.56-18.50	2.16
French franc	6.87-31.50	4.59
Japanese yen	1.31-15.50	11.83
SDR-denominated	7.52-16.49	2.19

Table 5. Differences Between Weighted Average Domestic Rates and Quoted SDR Deposit Rates <sup>1/</sup>

		Maturity			
		Three- month	Six- month	One- year	
1981	Jan.	-0.63	-0.53	-0.42	
	Feb.	-0.85	-0.74	-0.63	
	Mar.	-0.08	+0.05	-0.35	
	Apr.	-0.44	-0.77	-0.30	
	May	-0.83	-0.49	-0.68	
	June	-1.07	-1.06	-0.28	
	July	-1.53	-1.35	-0.76	
	Aug.	-1.76	-1.14	-0.41	
	Sept.	-2.25	-1.70	-0.74	
	Oct.	-1.10	-1.07	-0.57	
	Nov.	-0.63	-0.57	-0.49	
	Dec.	-0.89	-0.98	-0.56	
		Average	-1.00	-0.86	-0.52
1982	Jan.	-0.95	-0.78	-0.61	
	Feb.	-0.83	-0.46	-0.41	
	Mar.	-1.46	-1.11	-0.81	
	Apr.	-1.18	-0.99	-0.63	
	May	-2.20	-1.73	-1.28	
	June	-1.18	-1.07	-0.85	
	July	-0.91	-0.90	-0.82	
	Aug.	-1.72	-1.43	-1.35	
	Sept.	-2.07	-1.73	-1.65	
	Oct.	-1.36	-1.14	-1.13	
	Nov.	-1.00	-1.04	-0.90	
	Dec.	-1.53	-1.36	-0.92	
		Average	-1.37	-1.15	-0.95
1983	Jan.	-1.01	-1.05	-0.88	
	Feb.	-1.07	-0.89	-0.61	
	Mar.	-0.06	-0.25	-0.36	
	Apr.	-0.19	-0.40	-0.54	
	May	-0.36	-0.53	-0.56	
	June	-0.25	-0.45	-0.49	
	July	-0.23	-0.42	-0.32	
	Sept.	-0.36	-0.39	-0.25	
	Oct.	-0.21	-0.10	+0.05	
	Nov.	-0.26	-0.18	-0.10	
	Dec.	-0.33	-0.23	-0.09	
		Average	-0.38	-0.42	-0.35

<sup>1/</sup> Weighted average domestic rate minus SDR-denominated deposit rate. The domestic rates are considered the most representative of short-term domestic money market conditions and in some cases are Treasury bill yields, in other cases, inter-bank deposit rates.

Table 6. Summary Statistics of Variability: SDR-Denominated and Eurocurrency Deposit Interest Rates

	Coefficient of variation				Yield curve spread 1/		
	One-month	Three-month	Six-month	One-year	Low	High	Difference
Eurodollar	0.256	0.242	0.226	0.198	0.895	1.232	0.337
Euro-Deutsche mark	0.329	0.317	0.297	0.270	0.857	1.256	0.399
Euro-sterling	0.219	0.217	0.204	0.181	0.785	1.224	0.439
Euro-French franc	0.369	0.309	0.263	0.221	0.672	1.454	0.782
Euro-yen	0.311	0.285	0.252	0.207	0.721	2.573	1.852
SDR-denominated deposits	0.217	0.210	0.196	0.178	0.900	1.193	0.293

1/ Range displayed from January 1979 to December 1984 in the ratio of the one-year to the one-month rate.

Aside from the case of the coefficient of variation for the sterling deposits, the U.S. dollar deposits show the least interest rate variability of the five eurocurrencies and yet the SDR-denominated deposit rates outperform the U.S. dollar on these measures even though the effective weight of the dollar is about one half in the composition of the SDR. This is attributable to frequently offsetting movements in the individual eurocurrency rates. For example, in May and June 1980 eurodollar rates declined sharply from April's level while euro-Deutsche mark rates and euro-yen rates firmed (euro-sterling rates were little changed and euro-French franc rates eased only slightly). Another illustration of offsetting changes in the eurocurrency interest rates is that over the period there were 21 occasions in which the direction of change from the previous month in the one-month SDR-denominated rate was opposite to that for the U.S. dollar rate. Two such occasions were in May and June 1982, principally because of the influence on the SDR-denominated deposit rates of factors the same as those that resulted in a sharp rise and then an even sharper fall in euro-French franc deposit rates. A further illustration of the separate character of the SDR-denominated deposits from even the eurodollar deposits can be seen in the differences in the shape of the yield curve. Out of 72 observations there were 12 occasions on which the slope of the respective curves were in opposite directions. Thus, despite the inclusion of sometimes volatile components, SDR-denomination over time provides more stable interest rate patterns than those of U.S. dollar deposit rates. This feature may be a worthwhile attraction to a risk-averse investor wishing to automatically roll over relatively short-term investments in an environment of uncertainty about both exchange rates and interest rates in the euromoney market.

It is worthwhile to note that the individual eurocurrency rates show a declining pattern of volatility as maturity rises, as is the case with the SDR-denominated deposits. Charts 3 and 4 depict the term-structure for eurocurrency deposit rates and SDR-denominated deposit rates for June 1980 and May 1984 respectively, the two extreme cases with respect to the shape of the yield curve for the SDR-denominated deposit rates.

#### IV. Interest Rates on SDR-Denominated Bonds

During the period under study in this paper there were numerous fixed-coupon SDR-denominated bonds traded on the Luxembourg Stock Exchange. In 1981 there were eight such bonds but several of them have since matured and no new fixed rate bond has been issued since January 1981. Table 7 presents some of the available information on yields (to maturity) on these fixed coupon SDR-denominated bonds quoted on the Luxembourg Stock Exchange. <sup>1/</sup> While the number of these issues outstanding is too limited to permit extensive statistical analysis, a number of parallels on the evolution of these rates with the SDR-denominated deposit rates can be noted. The yields rose noticeably through to mid-1980 as inflationary expectations rose and then stabilized as inflationary expectations stabilized. In the first half of 1982, however, as with the deposit rates, they did not ease as much as might have been expected from the inflation expectations data, perhaps, in the case of the bond yields, because the time horizon for the inflation expectations data given in Table 2 is short-term relative to the maturity of the bonds. Unlike the deposit interest rates in the second half of 1982, the bond yields showed no clear easing trend but by 1983 the bond yields had declined markedly in broad parallel to the deposit rates. The yield information in 1984 is too limited to draw significant conclusions.

It should be noted that these instruments are traded in the euro-bond market and, therefore, have a high degree of liquidity. In this light, it is interesting to note the considerable volatility of these rates, especially for the shorter terms to maturity. The highest yields on these bonds were recorded in September 1981, at the time the SDR-denominated deposit rates were very high, and displayed a noticeably downward-sloping yield curve. This is consistent with the effects of short-term monetary phenomena, such as the foreign exchange restrictions imposed by France in relation to speculation of an EMS realignment. The bond yields appear to have been more open to the influence of temporary factors than the deposit rates which was perhaps exacerbated by the relative thinness of the market.

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<sup>1/</sup> Current yields and yields to maturity have been published weekly in Yields for Straight Bonds Listed on the Luxembourg Stock Exchange by the Societe de la Bourse de Luxembourg.

CHART 3  
YIELD CURVES  
EURO-CURRENCY DEPOSIT RATES AS AT JUNE 1980

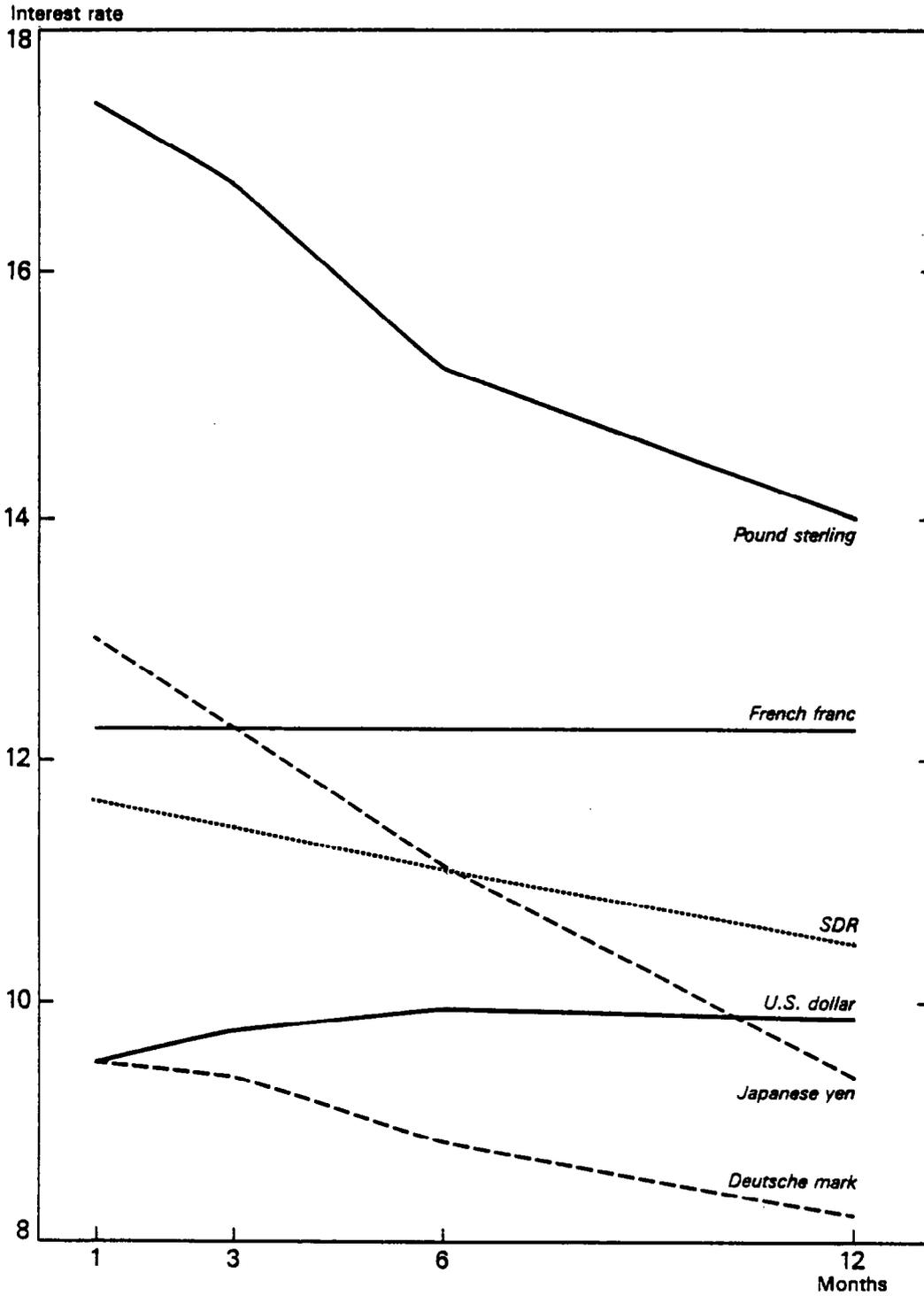




CHART 4  
YIELD CURVES  
EURO-CURRENCY DEPOSIT RATES AS AT MAY 1984

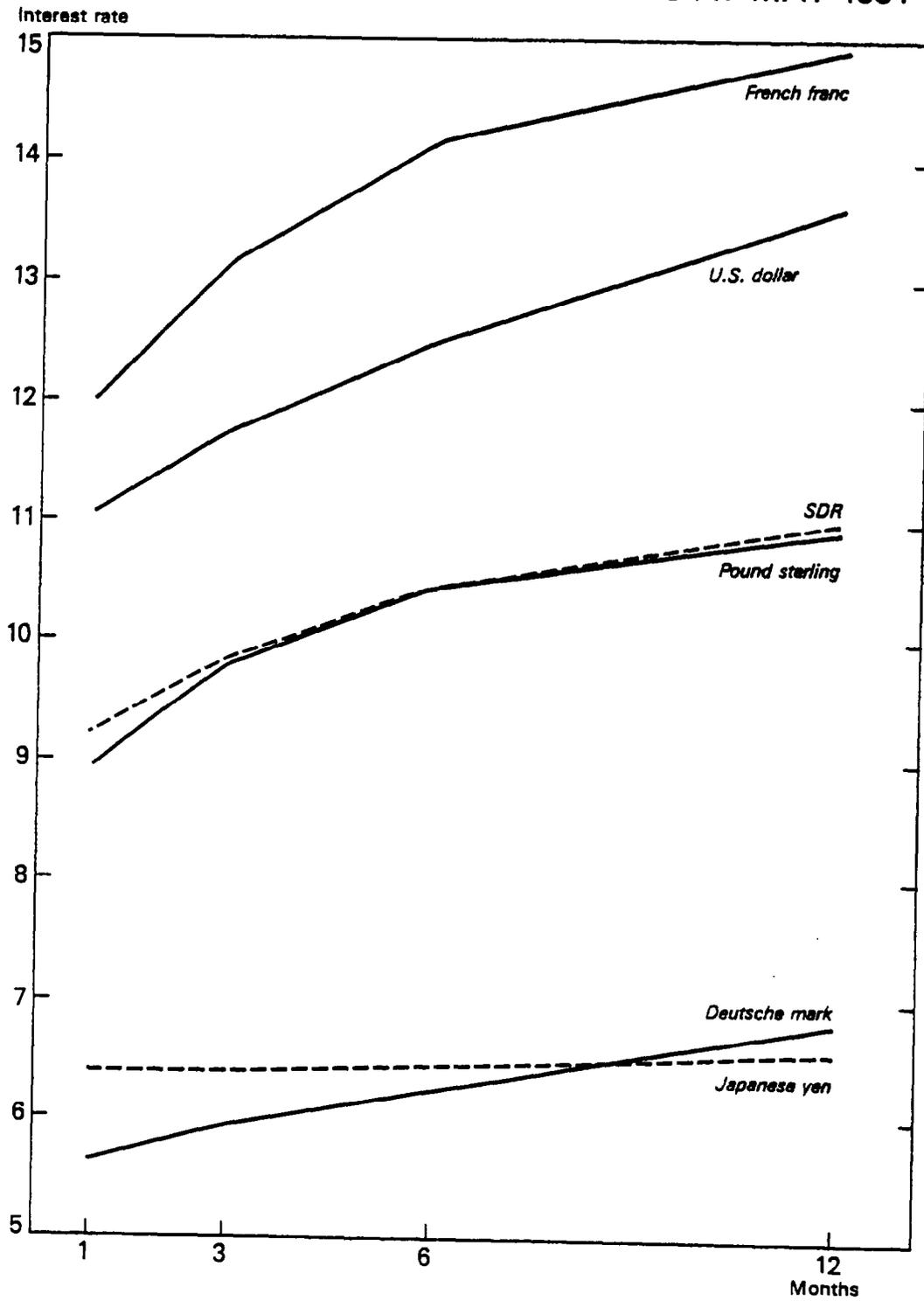




Table 7. Yields on Selected SDR-Denominated Bonds, 1979-84 1/

Bond issuer and description	1979		1980		1981		1982		1983		1984
	Mar.	Sept.	Mar.	Sept.	Mar.	Sept.	Mar.	Sept.	Mar.	Sept.	March
Swedish Investment Bank 9 percent maturing 1982	9.06	9.18	13.55	11.26	10.72	20.50	12.83	--	--	--	--
Electricite de France 9 percent maturing 1983	9.19	9.30	14.58	12.53	13.20	16.86	13.34	17.51	15.89	--	--
Finland 8.75 percent maturing 1984	--	9.78	12.53	12.76	13.84	16.06	15.75	14.40	11.96	9.54	--
Nordic Investment Bank 9.25 percent maturing 1984	--	9.51	10.09	10.20	11.40	15.74	15.96	17.64	13.96	10.96	10.43
Swedish Investment Bank 9 percent maturing 1985	9.03	9.43	11.20	10.55	12.20	14.35	14.51	12.05	11.46	10.86	12.05
Nordic Investment Bank 11.5 percent maturing 1986	--	--	--	--	12.48	14.35	13.56	11.45	11.47	10.93	11.46

1/ End-of-month yields to maturity of selected bonds quoted on the Luxembourg stock exchange.

With respect to the absolute level of the rates in relation to the bank deposit rates, the average of the 53-bond yield observations is 12.27 per cent while the average of the 11 corresponding March and September one-year SDR-denominated deposit interest rate observations was significantly lower at 11.53 per cent. The relationship is not uniform, however, from period to period, and on occasions the bond yields were lower than the corresponding one-year deposit rate. It would be tempting to attribute the higher average bond yield to evidence of a rising risk premium as maturity lengthens but this should not be concluded because the high degree of tradability of these bonds gives them a different character in relation to fixed term deposits.

A comparison can also be made of the bond yields against a weighted average of five-year domestic investment yields for the period March 1981-March 1984. For this purpose, in order to compare broadly similar maturities, the average yield on only the two instruments with the longer term to maturity at the bottom of Table 7 has been used. In 1981, the SDR-bond yield was slightly lower than the combined domestic yield: 12.34 percent in March and 14.35 percent in September compared with 12.50 percent (end-April) and 14.44 percent for the combined domestic yield. In 1982, however, the SDR-bond yields became noticeably higher than the combined domestic yields; 14.04 percent in March and 11.75 percent in September for the bonds compared with 12.88 percent and 11.11 percent for the combined domestic instruments. While both the SDR-bond yields and the combined five-year domestic instruments declined significantly in 1983, the bond yield's positive margin continued to be sizable; the bond yields were 11.46 percent and 10.89 percent in March and September respectively while the combined five-year domestic yields were 9.92 percent and 10.48 percent respectively. The rates moved higher again in early 1984 with the SDR bonds yielding 11.76 percent compared with 10.63 percent for the combined domestic yields. It should be noted from Part III above that the SDR-denominated deposit rates also tended to be higher than combined domestic yields for similar maturities.

#### V. Summary and Conclusions

The market in private SDR-denominated instruments emerged in 1974-75 and received a significant boost from late 1978 because of the preceding sustained period of depreciation of the U.S. dollar. A further boost was provided in 1981 when the valuation of the SDR was simplified. Volume in the market, however, has always been relatively small and the market has shrunk in recent years as confidence returned in the U.S. dollar as a sound medium of investment (investors have preferred straight U.S. dollar assets to SDR-denominated assets that are only partly U.S. dollar linked) and following successful promotion of the ECU by the European Community as an aspect of the trend toward European economic integration.

The purpose of this paper has been to present an analysis of the level and structure of interest rates on SDR-denominated deposits and, to a lesser extent, bonds. Since the deposit interest rate information is available for maturities from one-month to one year, the analysis has been relatively narrowly structured around the concept of the term structure of interest rates. As background for the analysis, some commonly used formulas for assessing the appropriateness of the level of an interest rate on an SDR-denominated asset were discussed. The "combined market rate" formula was described in two versions--one where individual market yields are taken directly from the eurocurrency market and the other where the yields are deduced with the help of information from the forward exchange markets. These two approaches reflect the fact that an investor can establish an SDR-denominated asset by taking positions either in the deposit markets or (for up to four currencies vis-a-vis a vehicle currency or currencies) in the forward exchange markets. An alternative formula used by some commercial banks implicitly weights the five component yields by forward exchange rates. This approach yields a systematically lower rate for the SDR by a small margin since high interest rate currencies are usually quoted at discounts in the forward exchange markets which gives them a lower implicit percentage share in the forward valuation of the SDR.

Changes in the level and structure of the SDR-denominated deposit rates were found to be somewhat related to changes in inflationary expectations, represented in this analysis by official semiannual OECD projections for GNP deflators. A significant positive real rate of interest measured against these expectations was evident but it was not constant over the time period. Only limited evidence of a risk premium rising as maturity increases was found, and it is possible the range of rates was too short to reveal anything but an essentially constant level of risk premium across maturities; it is quite likely, however, that the risk premium changed significantly from period to period since the "real" rate of interest was quite volatile. Other factors such as short-term policy changes imparting temporary monetary shocks also appeared to affect the rates since short-term deposit rates were more volatile than long-term ones, consistent with the expectation of a greater impact of these shocks on the shorter rates.

In a comparison with individual eurocurrency rates comprising the basket, the SDR-denominated deposit rates were shown to be more stable than the individual eurocurrency rates. This feature may offer an advantage to a risk-averse investor facing an uncertain pattern of demands on its resources which, in circumstances of volatility in both exchange rates and interest rates might find it convenient to automatically roll over short-term SDR-denominated investments. The SDR-denominated deposit rates were found to be slightly lower than the weighted average yield an investor might construct by depositing appropriate amounts separately in the five individual eurocurrencies. This difference apparently reflects technical factors, transactions costs and/or profit margins, on which no information is available,

rather than the possibility that the yield on an SDR-denominated deposit as a composite unit could have a "life of its own", given the relative ease with which the currencies comprising the SDR valuation can be arbitrated. However, SDR-denominated deposit rates in the private market were significantly higher than a weighted average of money market instruments in domestic markets (in contrast to the eurocurrency market), primarily because yields or interest rates on low risk domestic government instruments are generally lower than those on privately issued instruments in the offshore market.

Yields on fixed coupon SDR-denominated bonds quoted on the Luxembourg stock exchange displayed some patterns similar to the fixed-term deposit rates but conclusions here are less certain because of the limited number of issues outstanding. The bond yields appeared to react strongly to temporary monetary influences reflecting, perhaps, the effect of their tradability in the eurobond market exacerbated by the relative thinness of this special market. As with the deposit rates, the bond yields showed a tendency to be somewhat higher than a combined domestic yield for similar maturities.

Table 1. Eurodollar Deposit Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1979</u>	Jan.	10.12	10.31	10.56	10.56	1.043	1.043
	Feb.	9.62	10.50	10.94	10.44	1.137	1.085
	Mar.	10.25	10.50	10.56	10.56	1.030	1.030
	Apr.	10.44	10.75	11.06	10.87	1.059	1.041
	May	10.25	10.44	10.62	10.44	1.036	1.019
	June	10.81	10.50	10.50	10.19	0.971	0.943
	July	10.94	11.31	11.12	10.81	1.016	0.988
	Aug.	11.75	12.12	12.12	11.69	1.031	0.995
	Sept.	13.00	12.75	12.75	12.19	0.981	0.938
	Oct.	15.06	15.69	15.31	14.25	1.017	0.946
	Nov.	13.56	14.00	13.94	12.87	1.028	0.949
	Dec.	14.37	14.44	14.44	12.87	1.005	0.896
<u>1980</u>	Jan.	14.00	14.37	14.37	13.81	1.026	0.986
	Feb.	16.12	16.94	17.00	16.37	1.055	1.016
	Mar.	19.25	19.69	19.56	18.00	1.016	0.935
	Apr.	14.25	14.37	13.69	12.75	0.961	0.895
	May	9.87	10.12	10.25	10.25	1.039	1.039
	June	9.50	9.75	9.94	9.87	1.046	1.039
	July	9.50	9.81	10.06	10.19	1.059	1.073
	Aug.	11.19	12.25	12.50	12.50	1.117	1.117
	Sept.	13.19	13.81	13.94	13.69	1.057	1.038
	Oct.	14.50	15.37	14.87	14.12	1.026	0.974
	Nov.	18.37	18.06	16.87	15.50	0.918	0.844
	Dec.	19.12	17.62	16.75	14.87	0.876	0.778
<u>1981</u>	Jan.	17.68	17.50	16.75	15.75	0.947	0.891
	Feb.	16.81	16.62	16.75	16.06	0.996	0.955
	Mar.	14.81	14.81	14.81	14.81	1.000	1.000
	Apr.	17.75	16.87	17.00	16.31	0.958	0.919
	May	17.87	17.75	16.94	16.12	0.948	0.902
	June	18.12	17.81	17.25	16.31	0.952	0.900
	July	18.68	18.68	18.68	17.62	1.000	0.943
	Aug.	18.00	18.44	18.56	17.81	1.031	0.989
	Sept.	16.50	17.75	18.06	17.37	1.095	1.053
	Oct.	15.06	15.69	16.00	16.06	1.062	1.066
	Nov.	11.62	12.00	12.62	13.06	1.086	1.124
	Dec.	13.31	13.75	14.81	14.75	1.113	1.108
<u>1982</u>	Jan.	14.12	14.50	15.00	15.06	1.062	1.067
	Feb.	14.56	14.94	15.06	15.00	1.034	1.030
	Mar.	15.31	15.37	15.44	15.31	1.008	1.000
	Apr.	15.06	14.94	14.87	14.63	0.987	0.971
	May	14.38	14.38	14.44	14.44	1.004	1.004
	June	15.44	15.81	16.00	16.00	1.036	1.036

Table 1 (concluded). Eurodollar Deposit Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1982</u>	July	12.13	13.06	13.38	14.06	1.103	1.159
	Aug.	10.94	11.88	12.44	12.87	1.137	1.176
	Sept.	11.00	11.44	11.94	12.19	1.085	1.108
	Oct.	9.62	10.00	10.19	10.50	1.059	1.091
	Nov.	9.38	9.88	10.13	10.38	1.080	1.107
	Dec.	9.13	9.19	9.50	9.63	1.041	1.055
<u>1983</u>	Jan.	9.00	9.25	9.56	9.75	1.062	1.083
	Feb.	8.56	8.75	8.88	9.13	1.037	1.067
	Mar.	9.44	9.63	9.75	9.94	1.033	1.053
	Apr.	8.94	8.88	9.06	9.25	1.013	1.035
	May	9.13	9.44	9.63	9.81	1.055	1.074
	June	9.50	9.69	9.94	10.06	1.046	1.059
	July	9.81	10.19	10.63	10.75	1.084	1.096
	Aug.	9.88	10.25	10.63	10.94	1.076	1.107
	Sept.	9.38	9.50	9.69	10.00	1.033	1.066
	Oct.	9.44	9.63	9.69	9.94	1.026	1.053
	Nov.	9.69	9.75	9.94	10.31	1.026	1.064
	Dec.	9.69	9.81	10.06	10.38	1.038	1.071
<u>1984</u>	Jan.	9.50	9.63	9.88	10.19	1.040	1.072
	Feb.	9.88	10.13	10.38	10.81	1.051	1.094
	Mar.	10.44	10.63	10.94	11.44	1.048	1.096
	Apr.	10.63	10.94	11.25	11.75	1.058	1.105
	May	11.06	11.75	12.50	13.63	1.130	1.232
	June	11.75	12.13	12.63	13.50	1.075	1.149
	July	11.50	11.81	12.25	12.75	1.065	1.109
	Aug.	11.69	11.88	12.13	12.63	1.038	1.080
	Sept.	11.00	11.38	11.56	11.81	1.051	1.109
	Oct.	9.75	10.00	10.25	10.81	1.051	1.109
	Nov.	8.81	9.06	9.50	10.06	1.078	1.142
	Dec.	8.38	8.63	9.13	9.81	1.089	1.171
Average:		12.41	12.66	12.78	12.66	1.030	1.020
Standard deviation:		3.15	3.07	2.89	2.50	--	--
Coefficient of variation:		0.254	0.242	0.226	0.198	--	--

Source: Morgan Guaranty Trust Co., World Financial Markets.

Table 2. Euro-Deutsche Mark Deposit Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
1979	Jan.	3.50	3.81	4.12	4.37	1.177	1.249
	Feb.	3.87	3.94	4.19	4.50	1.083	1.163
	Mar.	4.75	4.94	5.37	5.50	1.131	1.158
	Apr.	5.12	5.44	5.87	6.25	1.146	1.221
	May	5.62	6.12	6.75	7.06	1.201	1.256
	June	6.12	6.19	6.62	6.87	1.082	1.123
	July	6.19	6.50	6.94	6.94	1.121	1.121
	Aug.	7.25	7.44	7.62	7.62	1.051	1.051
	Sept.	7.19	7.44	7.50	7.50	1.043	1.043
	Oct.	8.12	8.94	8.87	8.62	1.092	1.062
	Nov.	9.12	8.81	8.62	8.00	0.945	0.877
	Dec.	8.50	8.56	8.56	8.12	1.007	0.955
1980	Jan.	8.25	8.37	8.44	8.56	1.023	1.038
	Feb.	8.75	9.31	9.37	9.44	1.071	1.079
	Mar.	8.94	9.69	10.06	10.00	1.125	1.119
	Apr.	9.06	9.06	9.00	8.69	0.993	0.959
	May	9.37	9.37	9.00	8.50	0.961	0.907
	June	9.50	9.37	8.81	8.19	0.927	0.862
	July	8.69	8.25	7.81	7.75	0.899	0.892
	Aug.	8.62	8.50	8.31	8.12	0.964	0.942
	Sept.	8.87	8.87	8.87	8.69	1.000	0.980
	Oct.	8.81	8.94	8.81	8.56	1.000	0.972
	Nov.	9.69	9.56	9.31	9.37	0.961	0.967
	Dec.	8.87	8.87	8.87	8.93	1.000	1.007
1981	Jan.	9.31	9.37	9.37	9.31	1.006	1.000
	Feb.	14.87	14.25	13.37	12.75	0.899	0.857
	Mar.	12.31	12.31	12.00	11.43	0.975	0.928
	Apr.	12.12	12.44	12.44	12.00	1.026	0.990
	May	12.25	12.68	12.68	12.68	1.035	1.035
	June	12.25	12.37	12.37	12.31	1.010	1.005
	July	12.06	12.44	12.56	12.44	1.041	1.032
	Aug.	12.18	12.44	12.68	12.44	1.041	1.021
	Sept.	11.87	12.12	12.25	11.69	1.032	0.985
	Oct.	11.19	11.44	11.44	11.25	1.022	1.005
	Nov.	10.56	10.31	10.06	9.75	0.953	0.923
	Dec.	10.44	10.50	10.56	10.25	1.011	0.982
1982	Jan.	10.00	10.12	10.12	10.12	1.012	1.012
	Feb.	9.81	9.94	9.94	9.94	1.013	1.013
	Mar.	9.13	9.13	9.13	9.13	1.000	1.000
	Apr.	9.00	8.87	8.81	8.50	0.979	0.944
	May	8.56	8.56	8.56	8.50	1.000	0.993
	June	8.87	9.00	9.12	9.25	1.028	1.043

Table 2 (concluded). Euro-Deutsche Mark Deposit  
Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1982</u>	July	8.87	8.87	9.12	9.12	1.028	1.028
	Aug.	8.12	8.19	8.44	8.44	1.039	1.039
	Sept.	7.62	7.75	7.94	7.94	1.042	1.042
	Oct.	7.00	7.00	7.00	6.94	1.000	0.991
	Nov.	7.19	7.06	7.06	7.00	0.982	0.974
	Dec.	5.88	5.88	5.94	6.00	1.010	1.020
<u>1983</u>	Jan.	5.63	5.63	5.69	5.88	1.011	1.044
	Feb.	5.38	5.25	5.38	5.50	1.000	1.022
	Mar.	4.81	4.94	5.13	5.38	1.067	1.019
	Apr.	4.88	5.00	5.06	5.31	1.037	1.088
	May	4.94	5.06	5.25	5.69	1.063	1.152
	June	4.94	5.19	5.50	5.94	1.113	1.202
	July	4.81	5.06	5.50	5.94	1.143	1.235
	Aug.	5.25	5.50	5.94	6.44	1.131	1.227
	Sept.	5.56	5.75	5.88	6.19	1.058	1.113
	Oct.	5.56	5.81	5.81	6.13	1.045	1.103
	Nov.	6.19	6.19	6.19	6.44	1.000	1.040
	Dec.	5.25	5.88	6.13	6.38	1.168	1.125
<u>1984</u>	Jan.	5.69	5.88	6.19	6.38	1.088	1.121
	Feb.	5.50	5.81	5.94	6.19	1.044	1.088
	Mar.	5.50	5.56	5.75	6.13	1.045	1.115
	Apr.	5.44	5.63	5.75	6.19	1.057	1.138
	May	5.63	5.94	6.25	6.81	1.110	1.210
	June	5.56	5.88	6.19	6.75	1.113	1.214
	July	5.25	5.75	6.13	6.56	1.168	1.250
	Aug.	5.31	5.50	5.88	6.19	1.107	1.166
	Sept.	5.31	5.50	5.88	6.19	1.107	1.166
	Oct.	5.56	5.81	5.81	5.88	1.045	1.058
	Nov.	5.56	5.56	5.63	5.69	1.013	1.023
	Dec.	5.50	5.50	5.56	5.56	1.011	1.011
Average:		7.69	7.82	7.90	7.93	1.027	1.031
Standard deviation:		2.53	2.48	2.35	2.14	--	--
Coefficient of variation:		0.329	0.317	0.297	0.270	--	--

Source: Morgan Guaranty Trust Co., World Financial Markets.

Table 3. Euro-Sterling Deposit Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1979</u>	Jan.	12.67	13.25	13.25	12.94	1.046	1.021
	Feb.	13.19	12.44	11.87	11.81	0.900	0.895
	Mar.	12.37	12.12	11.75	11.62	0.950	0.939
	Apr.	12.06	11.69	11.19	11.00	0.929	0.912
	May	11.75	11.75	11.56	11.37	0.984	0.968
	June	14.25	14.00	13.44	12.62	0.943	0.886
	July	14.75	14.75	14.12	13.25	0.957	0.898
	Aug.	14.37	14.25	14.25	13.75	0.992	0.957
	Sept.	13.87	14.06	14.06	13.50	1.014	0.973
	Oct.	14.37	15.12	15.00	14.56	1.044	1.013
	Nov.	16.00	16.50	16.25	15.12	1.016	0.945
	Dec.	16.75	16.75	16.75	15.25	1.000	0.910
<u>1980</u>	Jan.	18.50	18.00	17.00	16.00	0.919	0.865
	Feb.	17.75	18.50	18.37	17.87	1.035	1.007
	Mar.	18.00	18.25	18.37	17.50	1.021	0.972
	Apr.	17.25	17.25	16.37	15.37	0.949	0.891
	May	17.00	16.75	16.12	14.75	0.948	0.868
	June	17.37	16.75	15.25	14.00	0.878	0.806
	July	16.87	15.62	14.25	13.25	0.845	0.785
	Aug.	16.75	16.62	16.25	15.12	0.970	0.903
	Sept.	16.25	15.87	15.00	14.37	0.923	0.884
	Oct.	17.00	16.75	16.12	15.00	0.948	0.882
	Nov.	14.50	14.62	14.44	14.00	0.996	0.965
	Dec.	14.75	14.75	14.25	14.00	0.966	0.949
<u>1981</u>	Jan.	14.25	13.75	13.12	13.12	0.921	0.921
	Feb.	13.75	12.75	12.12	12.00	0.881	0.873
	Mar.	12.50	12.50	12.37	12.18	0.990	0.974
	Apr.	12.37	12.37	12.37	12.37	1.000	1.000
	May	11.87	12.37	12.75	12.87	1.074	1.084
	June	11.81	12.50	12.81	13.12	1.085	1.111
	July	14.25	14.62	14.62	14.50	1.026	1.018
	Aug.	13.50	13.87	14.00	14.00	1.037	1.037
	Sept.	16.50	17.00	17.00	16.25	1.030	0.985
	Oct.	16.25	17.50	18.50	18.75	1.138	1.154
	Nov.	15.19	15.00	14.62	14.44	0.962	0.951
	Dec.	15.37	15.69	15.69	15.37	1.021	1.000
<u>1982</u>	Jan.	14.37	14.44	14.50	14.31	1.009	0.996
	Feb.	14.00	14.00	14.00	13.94	1.000	0.996
	Mar.	13.50	13.50	13.56	13.56	1.004	1.004
	Apr.	13.50	13.62	13.62	13.69	1.008	1.014
	May	13.37	13.37	13.37	13.37	1.000	1.000
	June	13.00	13.06	13.06	13.13	1.005	1.010

Table 3 (concluded). Euro-Sterling Deposit  
Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1982</u>	July	11.88	11.81	11.81	11.94	0.994	1.005
	Aug.	11.00	10.81	10.81	10.81	0.983	0.983
	Sept.	10.88	10.50	10.50	10.50	0.965	0.965
	Oct.	9.88	9.44	9.44	9.44	0.955	0.955
	Nov.	10.44	10.44	10.38	10.31	0.994	0.988
	Dec.	10.59	10.44	10.31	10.31	0.974	0.974
<u>1983</u>	Jan.	11.50	11.50	11.44	11.25	0.995	0.978
	Feb.	11.38	11.25	13.19	10.75	1.159	0.945
	Mar.	10.75	10.69	10.63	10.56	0.989	0.982
	Apr.	10.25	10.19	10.06	10.00	0.981	0.976
	May	10.25	10.25	10.25	10.31	1.000	1.006
	June	9.63	9.63	9.88	10.06	1.026	1.045
	July	9.56	9.81	10.25	10.50	1.072	1.098
	Aug.	9.56	9.75	10.13	10.50	1.060	1.098
	Sept.	9.63	9.56	9.56	9.81	0.993	1.019
	Oct.	9.19	9.25	9.38	9.69	1.021	1.054
	Nov.	9.06	9.25	9.44	9.69	1.042	1.070
	Dec.	9.13	9.31	9.50	9.81	1.041	1.074
<u>1984</u>	Jan.	9.19	9.38	9.56	9.88	1.040	1.075
	Feb.	9.13	9.19	9.31	9.50	1.020	1.041
	Mar.	8.75	8.88	9.06	9.31	1.035	1.064
	Apr.	8.56	8.81	9.06	9.38	1.058	1.096
	May	8.94	9.81	10.44	10.94	1.168	1.224
	June	8.81	9.44	9.94	10.56	1.128	1.199
	July	12.25	12.25	12.19	12.13	0.995	0.990
	Aug.	10.75	10.69	10.63	10.75	1.011	1.000
	Sept.	10.69	10.69	10.69	10.75	1.000	1.006
	Oct.	10.63	10.50	10.44	10.56	0.982	0.993
	Nov.	9.69	9.69	9.81	10.00	1.012	1.032
	Dec.	9.50	9.88	10.00	10.19	1.053	1.073
Average:		12.77	12.80	12.71	12.49	0.995	0.978
Standard deviation:		2.80	2.77	2.60	2.27	--	--
Coefficient of variation:		0.219	0.217	0.204	0.181	--	--

Source: Morgan Guaranty Trust Co., World Financial Markets.

Table 4. Euro-French Franc Deposit Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1979</u>	Jan.	7.12	7.94	8.50	9.12	1.194	1.281
	Feb.	6.87	7.75	8.62	8.94	1.255	1.301
	Mar.	7.62	8.12	8.75	9.25	1.148	1.214
	Apr.	8.50	8.25	8.62	9.25	1.014	1.088
	May	11.37	11.37	11.50	11.50	1.011	1.011
	June	10.75	11.00	11.37	11.37	1.058	1.058
	July	11.94	12.06	12.50	12.25	1.047	1.026
	Aug.	11.87	12.44	12.94	12.94	1.090	1.090
	Sept.	13.12	13.25	13.37	13.31	1.019	1.014
	Oct.	13.12	14.00	14.00	13.87	1.067	1.057
	Nov.	13.12	13.62	13.62	13.62	1.038	1.038
	Dec.	13.87	14.00	14.12	13.75	1.018	0.991
<u>1980</u>	Jan.	12.12	12.81	13.37	13.56	1.103	1.119
	Feb.	13.12	13.87	14.62	14.62	1.114	1.114
	Mar.	13.37	14.12	14.50	14.87	1.085	1.112
	Apr.	12.50	12.75	12.87	13.00	1.030	1.040
	May	12.31	12.50	12.62	12.75	1.025	1.036
	June	12.25	12.25	12.25	12.25	1.000	1.000
	July	12.37	12.12	12.00	11.94	0.970	0.965
	Aug.	12.00	12.12	12.37	12.62	1.031	1.052
	Sept.	11.62	12.06	12.56	12.81	1.081	1.102
	Oct.	11.00	11.31	12.00	12.62	1.091	1.147
	Nov.	10.50	11.37	12.37	13.00	1.178	1.238
	Dec.	11.12	11.75	12.25	12.87	1.102	1.157
<u>1981</u>	Jan.	10.37	10.87	11.87	12.62	1.145	1.217
	Feb.	11.75	12.87	13.00	13.00	1.106	1.106
	Mar.	12.00	12.37	12.50	13.00	1.042	1.083
	Apr.	13.12	13.50	13.62	13.62	1.038	1.038
	May	22.50	19.50	18.50	17.00	0.822	0.756
	June	26.00	23.00	21.00	19.00	0.808	0.731
	July	21.50	21.50	21.25	19.50	0.988	0.907
	Aug.	31.00	27.50	25.00	22.00	0.806	0.710
	Sept.	31.50	27.00	25.25	23.00	0.802	0.730
	Oct.	16.25	17.50	18.50	18.75	1.138	1.154
	Nov.	16.00	16.62	17.37	18.00	1.086	1.125
	Dec.	15.75	17.00	18.00	18.25	1.143	1.159
<u>1982</u>	Jan.	15.12	16.56	17.19	17.19	1.137	1.139
	Feb.	14.75	15.62	16.50	16.87	1.119	1.144
	Mar.	29.00	22.50	20.50	19.50	0.707	0.672
	Apr.	21.50	22.00	21.75	19.75	1.012	0.919
	May	29.50	16.75	23.75	23.75	0.805	0.805
	June	15.50	16.75	18.00	18.63	1.161	1.202

Table 4 (concluded). Euro-French Franc Deposit  
Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1982</u>	July	14.75	16.00	17.37	18.00	1.178	1.220
	Aug.	21.00	23.75	22.75	21.00	1.083	1.000
	Sept.	16.25	18.00	19.00	19.25	1.169	1.185
	Oct.	20.00	20.00	20.00	19.00	1.000	0.950
	Nov.	19.50	19.75	20.38	20.00	1.045	1.026
	Dec.	23.00	24.00	22.00	19.75	0.956	1.859
<u>1983</u>	Jan.	16.00	20.00	20.00	18.00	1.250	1.125
	Feb.	21.50	23.00	21.25	18.38	0.988	0.855
	Mar.	12.13	12.31	13.75	15.00	1.134	1.237
	Apr.	12.38	12.88	14.38	16.00	1.162	1.292
	May	12.50	13.38	15.75	17.25	1.260	1.380
	June	12.38	14.94	16.69	18.00	1.348	1.454
	July	12.13	13.50	15.25	16.75	1.257	1.381
	Aug.	13.00	15.00	16.75	16.88	1.288	1.298
	Sept.	12.75	14.31	15.81	16.19	1.240	1.270
	Oct.	12.25	12.88	14.00	14.88	1.143	1.215
	Nov.	12.25	13.19	14.13	14.69	1.153	1.199
	Dec.	12.13	12.19	12.31	12.63	1.015	1.041
<u>1984</u>	Jan.	12.13	13.00	13.75	14.38	1.134	1.185
	Feb.	16.00	17.25	16.75	16.13	1.047	1.008
	Mar.	12.94	14.38	15.13	15.88	1.169	1.227
	Apr.	11.94	13.13	13.88	14.88	1.162	1.246
	May	12.00	13.19	14.19	14.94	1.183	1.245
	June	11.81	12.31	13.25	14.56	1.122	1.233
	July	11.38	11.75	12.69	13.63	1.115	1.198
	Aug.	10.88	11.88	11.19	12.69	1.028	1.166
	Sept.	10.94	11.25	11.69	12.13	1.069	1.109
	Oct.	10.38	10.69	11.31	11.75	1.090	1.132
	Nov.	10.69	10.88	11.19	11.63	1.047	1.088
	Dec.	10.69	10.69	11.00	11.38	1.029	1.065
Average:		14.50	14.89	15.18	15.21	1.047	1.049
Standard deviation:		5.35	4.60	3.99	3.39	--	--
Coefficient of variation:		0.369	0.309	0.263	0.221	--	--

Source: Morgan Guaranty Trust Co., World Financial Markets.

Table 5. Euro-Yen Deposit Interest Rates: End of Month

		One-month	Three-month	Six-month	One-year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1979</u>	Jan.	1.31	2.56	3.12	3.37	2.382	2.573
	Feb.	2.19	3.44	4.00	3.87	1.826	1.767
	Mar.	5.87	6.00	5.56	5.87	0.947	1.000
	Apr.	4.44	4.94	5.56	6.00	1.252	1.351
	May	4.62	5.25	5.69	6.19	1.232	1.340
	June	4.69	5.75	6.06	6.12	1.292	1.305
	July	6.00	6.00	6.37	6.50	1.062	1.083
	Aug.	6.87	7.00	7.00	7.00	1.019	1.019
	Sept.	6.87	7.31	7.19	7.00	1.047	1.019
	Oct.	5.87	7.94	8.06	7.56	1.373	1.288
	Nov.	8.50	8.75	8.44	7.56	0.993	0.889
	Dec.	7.62	8.31	8.62	7.94	1.131	1.042
<u>1980</u>	Jan.	7.75	8.25	8.25	8.25	1.065	1.065
	Feb.	9.12	10.12	10.37	10.25	1.137	1.124
	Mar.	15.00	15.50	15.00	13.62	1.000	0.908
	Apr.	11.50	12.50	11.37	10.37	0.989	0.902
	May	12.62	12.25	11.37	10.25	0.901	0.812
	June	13.00	12.25	11.12	9.37	0.855	0.721
	July	12.87	12.25	11.37	9.75	0.883	0.757
	Aug.	11.62	11.62	11.12	9.75	0.957	0.889
	Sept.	12.50	12.25	11.50	10.50	0.920	0.840
	Oct.	10.00	9.62	9.12	9.00	0.912	0.900
	Nov.	10.25	10.12	10.12	9.37	0.987	0.914
	Dec.	9.12	9.25	9.62	9.37	1.055	1.027
<u>1981</u>	Jan.	8.25	8.50	8.50	8.50	1.030	1.030
	Feb.	8.62	8.62	8.37	8.37	0.971	0.971
	Mar.	7.75	7.62	7.75	7.81	1.000	1.007
	Apr.	6.62	7.37	7.37	7.37	1.113	1.113
	May	7.12	7.75	7.87	8.25	1.105	1.159
	June	7.00	7.50	7.87	7.87	1.124	1.124
	July	6.75	7.12	7.37	7.87	1.092	1.166
	Aug.	7.12	7.50	7.50	7.87	1.053	1.165
	Sept.	7.12	7.68	7.87	8.12	1.105	1.140
	Oct.	6.50	7.25	7.31	7.69	1.125	1.183
	Nov.	7.37	7.31	7.25	7.25	0.984	0.984
	Dec.	6.12	6.12	6.87	6.87	1.123	1.123
<u>1982</u>	Jan.	6.12	6.37	6.62	6.75	1.082	1.103
	Feb.	6.12	6.44	6.75	6.87	1.103	1.123
	Mar.	6.75	6.75	6.81	6.81	1.088	1.008
	Apr.	6.87	6.94	6.94	6.81	1.010	0.991
	May	7.06	7.12	7.12	7.38	1.008	1.045
	June	7.25	7.25	7.31	7.25	1.008	1.000

Table 5 (concluded). Euro-Yen Deposit  
Interest Rates: End of Month

		One- month	Three- month	Six- month	One- year	Ratio	
						Six-month to one-month	One-year to one-month
<u>1982</u>	July	6.69	7.12	7.38	7.12	1.103	1.064
	Aug.	7.06	7.31	7.44	7.44	1.054	1.054
	Sept.	7.00	7.25	7.50	7.56	1.071	1.080
	Oct.	6.75	6.88	6.94	7.00	1.028	1.037
	Nov.	7.31	7.25	7.19	7.19	0.984	0.984
	Dec.	6.75	6.75	6.81	6.81	1.008	1.009
<u>1983</u>	Jan.	6.56	6.56	6.50	6.63	0.991	1.011
	Feb.	6.69	6.63	6.50	6.56	0.972	0.981
	Mar.	6.38	6.38	6.38	6.44	1.000	1.009
	Apr.	6.13	6.19	6.19	6.38	1.010	1.041
	May	6.31	6.31	6.31	6.38	1.000	1.011
	June	6.44	6.50	6.50	6.50	1.009	1.009
	July	6.44	6.50	6.56	6.56	1.019	1.019
	Aug.	6.69	6.63	6.63	6.75	0.991	1.009
	Sept.	6.69	6.69	6.69	6.69	1.000	1.000
	Oct.	6.13	6.31	6.31	6.44	1.029	1.051
	Nov.	7.25	6.75	6.69	6.69	0.923	0.923
	Dec.	6.25	6.31	6.38	6.44	1.021	1.030
<u>1984</u>	Jan.	6.13	6.31	6.31	6.44	1.029	1.051
	Feb.	6.88	6.56	6.50	6.63	0.945	0.964
	Mar.	6.19	6.19	6.25	6.38	1.010	1.031
	Apr.	6.00	6.19	6.25	6.31	1.042	1.052
	May	6.38	6.38	6.44	6.56	1.009	1.028
	June	6.00	6.19	6.31	6.50	1.052	1.083
	July	6.13	6.31	6.31	6.50	1.029	1.060
	Aug.	6.38	6.31	6.31	6.50	0.989	1.019
	Sept.	6.13	6.31	6.31	6.44	1.029	1.051
	Oct.	6.13	6.31	6.31	6.31	1.029	1.029
	Nov.	6.50	6.31	6.31	6.31	0.971	0.971
	Dec.	6.19	6.19	6.13	6.13	0.990	0.990
Average		7.24	7.45	7.45	7.35	1.029	1.015
Standard deviation:		2.26	2.12	1.88	1.52	--	--
Coefficient of variations:		0.312	0.285	0.252	0.207	--	--

Source: Morgan Guaranty Trust Co., World Financial Markets.