

Ecu Bonds in Internationally Diversified Bond Portfolios

1. Overview

The European Currency Unit (ECU) is defined by a so-called basket of national currencies. Its value is determined by specific amounts of the currencies of EC member states – with the exception, so far, of the Spanish peseta and the Portuguese escudo. The box below indicates the amounts of these so-called component currencies as well as their weights in the basket on the basis of exchange rates as of June 30, 1987.

The paper focuses on the relative attractiveness of ECU-denominated investments in terms of their risk and return characteristics. This issue has been examined by R. HAMAUI (1985) and by H. JAGER and E. DE JONG (1986) with respect to money market investments. This paper deals with investments in international bonds (Euro- or foreign currency bonds) in the context of global diversification. It extends our previous work (M. S. WOLF, 1984, chapter 5) and our 1985 article, co-authored with B. POSCHADEL and O. REIM.

The composition of the ECU basket

Component currencies	Currency amounts		Weights in percent
Deutsche mark	0.71900	DM	34.69
French franc	1.31000	FF	18.95
Pound sterling	0.08780	UK£	12.48
Italian lira	140.00000	Lit.	9.32
Dutch guilder	0.25600	Dfl.	10.96
Belgian franc	3.71000	Bfr.	8.62
Lux. franc	0.14000	Lfr.	0.33
Danish krone	0.21900	Dkr.	2.79
Greek drachma	1.15000	Dr.	0.74
Irish pound	0.00871	Ir£	1.13
ECU			100.00

There are basically two reasons warranting this extension. Firstly, the above-mentioned studies point clearly to the conclusion that the attractiveness of an ECU investment is not so much related to an above-average performance in terms of total return (current interest income and change in value due to movements in bond prices and exchange rates) but resides rather in its characteristic of a comparably low-risk investment. This stability is a consequence of the underlying currency basket: changes in the exchange value of any one component currency are often mitigated by smaller changes in the same direction, or even by opposite changes, in the exchange values of other component currencies. In addition, yields on ECU bonds, while determined by demand and supply, are nevertheless related to the average of yields prevailing in the respective national currency segments of the international bond market. To the extent that interest rates do not move in completely parallel fashion, the basket construction of the ECU tends to mitigate interest rate volatility. This effect is clearly demonstrated by P. VAN DEN BOOGAERDE (1984) for the other major basket currency existing at present, namely the Special Drawing Right (SDR).

As a consequence of this feature, developments on the exchange markets such as periods of dollar strength or weakness, which mainly affect total return¹, should not alter our assessment of the basic characteristics of an investment in ECU bonds. Most of the above-mentioned studies are based, however, on data covering the period of increasing dollar strength in the first half of the 1980's. Thus, the task of proving the alleged irrelevance of medium-term trends in the exchange values of non-

component currencies remains to be accomplished.

In addition, our previous studies excluded the possibility of short-selling. HAMAUI (1985), however, calculated efficient portfolios exclusively under the assumption that short sales are feasible. The second extension, thus, consists in an assessment of the significance of this assumption.

The paper is organized as follows: Section two should familiarize the reader with what has been labelled 'the private use of the ECU'. Because many potential ECU investors and borrowers lack this familiarity, there is a tendency for ECU transactions to be concentrated with those not plagued by this problem. Therefore, a geographic breakdown of commercial banks' ECU business, as shown in section three, provides a clue as to the nationality of major classes of investors (and borrowers) in ECU. Section four puts the ECU bond market into perspective by means of comparison with other major currency segments of the Eurobond market. Section five provides an overview of the risk and return characteristics of alternative investments in international bonds denominated in various currencies for the period August 1983 to June 1987 as a whole and its breakdown into two subperiods. Section six discusses the role of ECU bonds in so-called efficient bond portfolios. Because of the reputation of the ECU as a vehicle for low-risk investments particular emphasis is given to lowest-variance portfolios. The possibility of short-selling is excluded in the portfolios presented in section six, but is discussed separately in section seven. The conclusions emanating from our analysis of efficient portfolios are drawn in section eight.

2. The private use of the ECU

The creation of the ECU dates back to 1979, when the European Monetary System (EMS) was founded. But in 1979 only the ground rules for the so-called official circulation of the ECU were established: When interventions in the foreign exchange markets by EMS central banks become necessary to maintain the agreed parities, the ECU serves as a unit of account and payment instrument.

In addition to this official circulation of the ECU, a private circulation developed from 1980

onwards. Already in 1983 the ECU was well established on the international financial markets, particularly on the Eurobond market. In that year the ECU market accounted for 4.4% of total Eurobond issues, which meant that the ECU had become the third most important Eurobond currency (after the US dollar and the D-mark) only two years after the first ECU issue had been floated. A parallel but somewhat less vigorous development could be observed in the use of the ECU as a lending medium, especially in the case of large-scale syndicated loans. The rapidly expanding interbank market represents another foothold of the ECU in the international financial markets.

The ECU's quick establishment on these markets is the more astonishing as there is no country on earth in which the ECU is a legal means of payment. This implies that a transaction in ECU can be executed only if all parties involved agree to its use. It is mainly due to the vigorous support of many internationally active commercial banks that this situation does not pose unsurmountable problems in practice. The commercial banks offer their customers most of the standard banking services in ECU. These include the opening of current accounts denominated in ECU for payment transactions, the conversion of foreign currency amounts into ECUs, and the crediting to an ECU account. In some countries, notably Belgium and Luxembourg, also time and savings accounts denominated in ECU can be opened. Both spot and forward transactions involving the ECU can be carried out, and credit can accordingly also be granted in the form of short-term fixed advances denominated in ECU. Furthermore, an ECU credit card is available as well as traveller's cheques denominated in ECU. There is a market for fixed deposits in ECU, and some banks accept fiduciary investments in ECU and issue ECU certificates of deposit (CDs). The number of banks active in the market for ECU bond issues is large and includes the major Swiss banks. Of course, these banks act as intermediaries in the acquisition of ECU bonds on the secondary market. Investors may also choose to purchase shares of ECU funds, offered e.g. by two Swiss banks. Finally, a broad spectrum of lending and borrowing instruments is available in ECU. This ranges from short-term credits for trade financing to long-term loans for investment in plant and equipment.

3. The size of the ECU market

The size of the ECU market can be estimated on the basis of statistics on ECU deposits at commercial banks. As the overwhelming majority of commercial banks reports to the Bank for International Settlements, the BIS statistics provide a reliable estimate. Commercial banks reporting to the BIS had, by the end of 1986, US \$ 53.1 bn outstanding in assets, denominated in ECU. Total claims exceeded liabilities, which stood at US \$ 46.4 bn. This means that the banks had created ECUs from the component currencies to make up for the shortfall of US \$ 6.7 bn (see Table 1, fourth line).

Table 1 shows that the Belgian and Luxembourg banks already handle a quite respectable volume of ECU deposits from domestic customers (namely US \$ 1.6 bn). In the aggregate, deposits of non-bank customers (enterprises, households, government entities, and international organizations) in ECU amounted to US \$ 4.4 bn by the end of 1986. These deposits together with the US \$ 6.7 bn created from the component currencies served as a basis for the lending activities of the commercial banks – both to each other and to non-bank customers. As can be seen from the table, most of the lending was interbank business (namely US \$ 39.6 bn). Still, the lending to non-bank customers in need of ECU amounted to US \$ 13.5 bn.

The third row of Table 1 reveals an important reason for the large interbank business in ECU. The banks in some countries (particularly Belgium, Luxembourg, and the Netherlands) collect more ECUs than they can lend on to domestic customers. In other countries (particularly Italy and France) the situation is just the reverse, reflecting e.g. the fairly large amount of ECU loans granted by Italian commercial banks to their domestic clients for trade financing. In view of this asymmetry between the lending and borrowing activities at the national level, it was natural that the interbank business in ECU would expand rapidly².

4. International issues of ECU bonds

The first ECU bond issue was floated in March 1981 by a Luxembourg bank for an Italian telecommunications company. The subscription was such a success that the original volume was increased twice. This prompted other borrowers to issue ECU bonds, too. The market expanded quickly. Table 2 shows the development of the nominal value of ECU bonds, issued in the course of a calendar year, from 1984 onwards, together with the respective figures for other major segments of the Eurobond market.

Table 1: Assets and liabilities of commercial banks denominated in ECU *

	Belgium and Luxembourg		France		Germany		Italy		Netherlands		United Kingdom		Other Countries		Total	
	A	L	A	L	A	L	A	L	A	L	A	L	A	L	A	L
1. Residents:																
Banks	3.8	3.8	4.8	4.8	–	–	1.0	1.1	0.2	0.1	3.0	2.7	0.4	0.4	13.2	12.9
Non-banks	0.4	1.6	1.5	0.1	–	–	2.8	–	0.1	0.8	0.9	0.8	0.8	0.1	6.5	3.4
Total	4.2	5.4	6.3	4.9	–	–	3.8	1.1	0.3	0.9	3.9	3.5	1.2	0.5	19.7	16.3
2. Foreigners:																
Banks	9.2	8.3	6.3	3.3	0.3	1.0	2.3	7.5	1.8	0.6	5.9	6.3	0.6	2.1	26.4	29.1
Non-banks	4.1	0.3	0.4	0.2	1.2	0.2	–	0.2	0.5	–	0.8	–	–	0.1	7.0	1.0
Total	13.3	8.6	6.7	3.5	1.5	1.2	2.3	7.7	2.3	0.6	6.7	6.3	0.6	2.2	33.4	30.1
3. Total (1+2):																
Banks	13.0	12.1	11.1	8.1	0.3	1.0	3.3	8.6	2.0	0.7	8.9	9.0	1.0	2.5	39.6	42.0
Non-banks	4.5	1.9	1.9	0.3	1.2	0.2	2.8	0.2	0.6	0.8	1.7	0.8	0.8	0.2	13.5	4.4
Total	17.5	14.0	13.0	8.4	1.5	1.2	6.1	8.8	2.6	1.5	10.6	9.8	1.8	2.7	53.1	46.4
4. Basket Currencies																
	3.5		4.6		0.3		2.7		1.1		0.6		0.9		6.7	

* In billion US dollar, end 1986. Source: Bank for International Settlements: *International Banking and Financial Market Developments*, April 1987; A ≙ Assets, L ≙ Liabilities.

Table 2: International issues of bonds*

Currency	1984	1985	1986	1987**
Canadian Dollar	2 147.4	2 822.0	5 365.2	3 337.0
Deutsche Mark	4 324.3	9 491.2	16 869.2	9 643.5
ECU	2 937.5	7 038.3	6 965.3	5 261.9
French Franc	–	1 057.9	3 398.4	1 295.7
Japanese Yen	1 190.1	6 539.4	18 673.2	17 145.0
Pound Sterling	3 964.5	5 766.2	10 510.2	9 429.7
US Dollar	65 333.6	96 481.5	117 220.0	31 805.1
Other Currencies	1 819.8	6 234.0	7 949.5	8 357.9
Total	81 717.2	135 430.5	186 951.6	86 275.8

* In million US dollars. Source: OECD Financial Statistics, Part 1, July 1987. ** First 6 months.

International institutions represent an important class of borrowers on the ECU bond market. The European Investment Bank (EIB) and the European Economic Community (EEC) have promoted the market through the flotation of many issues. The World Bank, too, has tapped the market on several occasions. In addition, federal and local governments as well as state-owned enterprises are heavy borrowers of ECU. Commercial banks have played an important role among the private enterprises issuing ECU bonds. In view of the dominant participation of international institutions, local and national governments, as well as companies backed by government guarantees, the average rating of the borrowers on the market for ECU bonds is excellent.

Little is known about the investors in ECU bonds. Private clients of commercial banks heavily engaged in ECU business are said to play an important role. If the figures in Table 1 can serve as a proxy, residents of four countries, namely Belgium, Luxembourg, the Netherlands, and the United Kingdom, are the major buyers of ECU bonds, since the commercial banks in these countries have built up the largest deposits from non-bank customers and originally private clients have absorbed most ECU bonds. It can be expected, however, that considerable amounts of ECU bonds have been acquired by investors domiciled in Switzerland, Japan, and the United States. There have been issues of ECU bonds especially targeted at investors in these countries. In addition, mutual funds in these countries are engaged in the purchase of ECU bonds. Recently, the demand for ECU bonds from Japanese institutional investors rose strongly.

5. ECU investment: comparison of risk and return

The characteristics of alternative investments in bonds, denominated in ECU and in six other currencies, are examined in terms of risk and return. Since the focus is on major groups of investors, four base currencies are selected, namely the Swiss franc, the Deutsche mark, the US dollar, and the Japanese yen. The risk and return characteristics of the aforementioned investments are expressed in each of these base currencies. In order to ensure comparability, performance indices for international bonds with an average maturity of six to seven years are chosen. In the case of dollar, pound, yen, mark, and ECU-bonds, Eurobond indices are used, while the guilder and Swiss franc indices refer to foreign bonds. The performance indices (end-of-month data) are calculated on the assumption of coupon payments being reinvested³. Table 3 shows the total return, that is the sum of coupon payments and gains or losses due to movements in bond prices and exchange rates, on the aforementioned alternative investments in each base currency in terms of the monthly average over the period from August 1983 to June 1987, and over the two subperiods August 1983 to June 1985 and June 1985 to June 1987. The volatility of these investments, also indicated in the table as a measure for risk, is calculated as the variance of monthly changes in total return.

Looking at the return figures first, an investment in ECU bonds turned out to be neither exceptionally good nor exceptionally bad on that account. This holds true for the period as a whole as well as for both subperiods. Broadly

Table 3: Alternative bond investments – return and risk

Base Currency	Investment in	Average Monthly Return (in percent)			Risk *		
		8:83- 6:85	6:85- 6:87	8:83- 6:87	8:83- 6:85	6:85- 6:87	8:83- 6:87
Sfr.	Sfr.	0.51	0.52	0.51	0.4	0.1	0.2
	DM	0.99	0.66	0.82	2.2	1.7	2.0
	Hfl.	1.12	0.66	0.87	2.9	2.2	2.5
	ECU	1.22	0.41	0.80	4.9	2.3	3.6
	UK£	1.08	-0.20	0.42	5.7	18.8	12.7
	US\$	1.95	-1.25	0.28	11.4	18.1	17.2
	Yen	1.44	0.79	1.10	4.8	6.5	5.7
DM	Sfr.	0.36	0.56	0.46	2.8	1.2	1.9
	DM	0.85	0.70	0.77	0.8	0.7	0.8
	Hfl.	0.97	0.69	0.83	1.7	1.0	1.3
	ECU	1.07	0.45	0.75	3.9	1.6	2.7
	UK£	0.94	-0.16	0.36	6.1	19.8	13.3
	US\$	1.80	-1.22	0.23	12.6	13.4	15.1
	Yen	1.23	0.82	1.05	7.4	7.7	7.4
US\$	Sfr.	-0.20	2.71	1.32	11.6	17.2	16.3
	DM	0.29	2.85	1.62	14.6	17.0	17.2
	Hfl.	0.41	2.84	1.68	14.4	14.3	15.6
	ECU	0.51	2.60	1.60	11.4	14.5	13.9
	UK£	0.38	1.99	1.22	18.2	22.8	20.8
	US\$	1.24	0.93	1.08	2.8	2.7	2.7
	Yen	0.73	2.97	1.90	6.5	19.1	14.1
Yen	Sfr.	-0.16	0.51	0.19	5.3	6.7	6.0
	DM	0.33	0.65	0.50	8.7	8.9	8.6
	Hfl.	0.46	0.65	0.56	8.6	8.4	8.3
	ECU	0.56	0.40	0.47	9.2	7.6	8.2
	UK£	0.42	-0.21	0.09	13.1	20.9	16.9
	US\$	1.29	-1.26	-0.04	5.6	16.0	12.5
	Yen	0.78	0.78	0.78	1.0	1.7	1.3

* Variance $\times 1000$.

speaking, an investment in ECU bonds exhibited a performance fairly similar, in terms of total return, to investments in mark or guilder bonds. During the first subperiod, a small exchange gain in combination with a somewhat larger difference in nominal yields in favour of ECU bonds resulted in a slightly better performance of the ECU investment when compared with an investment in the traditional European hard currencies (Swiss franc, D-mark and guilder). During the second subperiod, that difference in nominal yields was smaller on average and the ECU suffered an exchange loss against these currencies, so that the investment in the European hard currencies proved to be superior.

It is obvious that the basket construction of the ECU cannot prevent medium- and long-term trends in the exchange value of the ECU. The ECU basket includes the currencies of

countries with somewhat higher rates of inflation than are prevailing in the European hard currency countries. The currencies of the former countries have to be devalued occasionally to restore the competitiveness of their export industries. This implies a depreciation – though to a smaller extent – of the ECU against the European hard currencies. However, as the performance during the overall period shows, higher nominal yields on ECU bonds roughly compensated for this depreciation risk. The important point is that the ECU never, so far, experienced such large gyrations in its foreign exchange value as did the US dollar or the pound Sterling as is evident from Table 3. While an investment in US dollar bonds performed best, in terms of total return, in the first subperiod, exactly the reverse was true in the second subperiod. As the pound Sterling is part of the ECU basket, its depreciation in the second subperiod had a considerable impact on the exchange value of the ECU, accounting for most of the ECU's depreciation against the hard currencies during that period.

Turning to our measure for risk, i.e. the variance of monthly changes in total return, broadly speaking, the ECU bond investment belongs to the group of those foreign currency investments with relatively low volatility – independent of the base currency of the investor. However, an investment into bonds of the investor's base currency always exhibits much lower volatility than any foreign currency investment. This highlights the well-known fact that exchange risk accounts for most of the overall risk. For a Swiss franc or Deutsche mark based investor, ECU bonds showed a slightly higher volatility than an investment in the other European hard currencies. Most interestingly, this result is reversed for the US dollar based investor, while an unclear picture emerges for the yen based investor.

One may tentatively conclude that the capability of the ECU basket to reduce the exchange risk seems to be greatest when the base currency of the investor is itself exposed to heavy fluctuations on the exchange markets. Finally, it should be noted that the ranking of investments denominated in foreign currencies with respect to their volatility depends crucially upon the base currency of the investor. There is no investment vehicle, not even ECU bonds, exhibiting lowest volatility independent of the

base currency. Nevertheless, ECU bonds permit to stay fairly close to the lowest volatility investment in a large number of cases.

6. Efficient portfolios in the absence of short-selling

In the previous section investments in bonds denominated in seven currencies were treated as mutually exclusive options. This assumption is dropped now. The portfolio risk can be reduced by combining different investments without necessarily sacrificing return. Efficient portfolios exploit this effect in order to obtain either minimum volatility at a given rate of return, or, conversely, maximum return at a given level of volatility.

The set of points in the risk-return plane implied by the solution of one of these optimization problems is called the efficient frontier. Each point on the efficient frontier is associated with a different portfolio composition. Other criteria beyond the mean-variance approach⁴ are required to make a choice among the points on the efficient frontier. Because ECU instruments represent low-risk investment vehicles the emphasis, in this section, will be on efficient portfolios with lowest variance.

Table 4 indicates the composition of efficient portfolios with lowest variance attainable when short-selling is not feasible⁵. Looking at the overall period first, it appears that investors, with the exception of the Japanese, should find the inclusion of ECU bonds into their port-

folios attractive – but only to a relatively small extent. The share of ECU bonds in efficient portfolios remains also below 10% when portfolios exhibiting slightly higher risk are considered. Thus ECU bonds represent a suitable instrument for reducing the overall portfolio risk, faring better than many other bond investments in this respect.

A yen based investor faced a negative covariance between an investment in Euroyen and in Eurodollar bonds. Hence a blend with dollar bonds turned out to be most appropriate to reduce portfolio volatility. For this type of investor, the covariance between Euroyen and ECU bonds was practically identical to the covariance between Euroyen and Swiss franc bonds. But the covariance between Eurodollar and ECU bonds was higher than the covariance between Eurodollar and franc bonds. Therefore the investor fared slightly better with the inclusion of franc bonds in his portfolio than by adding ECU bonds.

This example highlights a more general conclusion: The European hard currencies are the strongest competitors to an ECU investment in the international bond market. This conclusion is easily appreciated when looking at the sub-periods. Due to the very low volatility of an investment in bonds denominated in his base currency, the Swiss investor had somewhat less incentive for international diversification than investors in the other base currencies. This was particularly true in the second subperiod. The share of ECU bonds declined relative to the first subperiod. In this case the base currency it-

Table 4: Lowest variance portfolios without short-selling

Base Currency	Period	Portfolio Components (in percent)							Return	Risk
		Sfr.	DM	Hfl.	ECU	UK£	US\$	Yen		
Sfr.	8:83–6:85	82.2	6.7	0.0	6.2	0.4	0.0	4.6	0.63	0.3
	6:85–6:87	96.2	0.0	0.0	1.3	0.8	0.0	1.7	0.52	0.1
	8:83–6:87	91.6	0.0	0.0	6.4	0.0	0.0	2.0	0.54	0.2
DM	8:83–6:85	0.0	81.9	0.0	8.9	0.0	7.2	2.0	0.94	0.6
	6:85–6:87	32.3	49.6	7.0	0.7	0.0	10.4	0.0	0.45	0.4
	8:83–6:87	12.4	71.7	2.0	7.3	0.0	6.7	0.0	0.69	0.6
US\$	8:83–6:85	0.0	0.0	0.0	11.9	0.0	76.6	11.6	1.10	2.4
	6:85–6:87	0.7	0.0	0.0	0.0	1.1	88.8	9.5	1.15	2.5
	8:83–6:87	0.0	0.0	0.0	3.1	1.6	85.9	9.4	1.18	2.5
Yen	8:83–6:85	3.6	0.0	0.0	3.8	0.0	12.0	80.6	0.80	0.9
	6:85–6:87	1.6	0.0	0.0	0.0	0.0	15.0	83.4	0.46	1.2
	8:83–6:87	5.7	0.0	0.0	0.0	0.0	12.5	81.8	0.64	1.1

self is the strongest 'competitor', severely limiting the role of ECU bonds. For a German investor an investment in ECU bonds had the lowest covariance with an investment in his base currency relative to an investment in bonds denominated in any of the other European currencies. But in the second subperiod the ECU investment fared worse than an investment in Swiss franc bonds. In addition, due to fairly similar covariance of ECU and guilder bonds with the base currency investment, but lower total return of ECU bonds, these lost ground against guilder bonds, too. Thus, both Swiss franc and guilder foreign bonds are important 'competitors' to ECU bonds. As Table 3 shows, in the second subperiod these effects should have induced D-mark based investors to shift almost completely out of ECU bonds. For the US dollar and yen based investors the covariance of the ECU investment with the investment in base currency bonds was also lowest relative to an investment in any other European currency in the first subperiod, but this feature disappeared in the second subperiod.

The poorer performance of an ECU investment in the second subperiod can be attributed largely to the behaviour of the British currency in that period. It follows that the depreciation of the pound Sterling alongside the US currency has severely reduced the attractiveness of the ECU. The resulting exchange loss did not only diminish the total return on ECU bonds, it also changed the covariance structure to the disadvantage of an investment in ECU bonds. It seems that this development was by far more

important than the depreciation of the US dollar itself. Therefore, the attractiveness of ECU bonds to investors with internationally diversified portfolios would be greatly enhanced, should the United Kingdom decide to participate in the intervention mechanism of the European Monetary System (EMS).

7. Efficient portfolios with the possibility of short-selling

The assumption that short-selling is not feasible is dropped in this section. Minimum variance portfolios have been computed⁶ and are shown in Table 5. The overall portfolio risk can be reduced to a larger extent if short-selling is allowed, because the opportunities to exploit the covariance structure are improved (although the effect is occasionally so small that there appears to be no difference in the volatility figures of Tables 4 and 5).

As can be seen from Table 5, the share of ECU bonds in the minimum variance portfolios is, in most cases, much larger than in Table 4. Contrary to the results of the former section, ECU bonds are also attractive to US dollar and yen based investors, when short-selling is feasible. Furthermore, the former conclusion of a reduced attractiveness of ECU bonds in the second subperiod seems to be almost reversed at first glance (except for the US dollar based investor).

Consider firstly the case of the Swiss franc based investor. The covariance between the

Table 5: Minimum variance portfolios with short-selling

Base Currency	Period	Portfolio Components (in percent)							Return	Risk
		Sfr.	DM	Hfl.	ECU	UK£	US\$	Yen		
Sfr.	8:83-6:85	82.0	7.5	-1.5	7.1	0.2	-1.7	6.3	0.62	0.3
	6:85-6:87	107.7	-24.6	-8.0	29.0	-4.6	0.1	4.1	0.48	0.1
	8:83-6:87	93.6	-5.1	2.1	8.5	-0.2	-1.6	2.6	0.55	0.2
DM	8:83-6:85	-12.5	96.8	-10.0	10.5	1.2	6.8	7.3	1.02	0.6
	6:85-6:87	39.4	33.9	-14.0	42.7	-12.1	13.4	-3.4	0.38	0.3
	8:83-6:87	14.4	71.0	0.8	11.1	-3.6	7.2	-0.9	0.70	0.6
US\$	8:83-6:85	-15.7	45.3	-64.4	36.5	-3.9	71.5	30.7	1.18	2.0
	6:85-6:87	48.1	-27.4	-34.1	9.6	-1.1	96.9	8.0	0.92	2.2
	8:83-6:87	12.4	8.5	-40.9	23.5	-0.3	88.2	8.7	1.10	2.3
Yen	8:83-6:85	6.5	22.5	-30.8	12.3	-4.8	10.8	83.6	0.76	0.8
	6:85-6:87	58.3	-80.8	4.9	23.9	-12.0	21.5	84.2	0.31	0.7
	8:83-6:87	28.0	-20.1	-5.2	7.1	-4.0	14.2	80.1	0.57	1.0

base currency investment and the ECU investment changed sign from negative to positive in the second subperiod, but still assumed a much lower value than the respective covariances with D-mark and guilder bonds. Thus the capability of the ECU investment to reduce the overall portfolio volatility deteriorated. Nevertheless the covariance structure remained in favour of the ECU investment, so that it paid off for the Swiss investor to issue D-mark and guilder bonds and to invest the proceeds in ECU bonds.

Consider finally, as an example for a non-European base currency, the situation of the Japanese investor. The share of the ECU investment rose from the first to the second subperiod, too, but much less so than the Swiss franc share – both at the expense of the D-mark share. In the first subperiod the covariance of the base currency and the ECU investment was lower than with the franc investment, while the reverse was true in the second subperiod. Because the respective covariance with D-mark bonds was even larger, the Japanese investor could reduce the overall portfolio risk by issuing D-mark bonds and acquiring Swiss franc and ECU bonds.

In sum, also when short-selling is feasible the ECU investment loses attractiveness in terms of its risk-reducing capacity in the second subperiod. This conclusion must remain intact, as it depends upon the covariance structures for these periods. However, Table 5 highlights an important implication of the basket construction of the ECU. This gives the ECU investment a comparative advantage over its component currencies in terms of the risk-reducing capacity. The best way to exploit this advantage consists in building up short positions in the component currencies and a long position in the basket currency itself⁷.

8. Conclusions

Nowadays commercial banks offer their customers most of the standard banking services in ECU. But the private use of the ECU developed only from 1980 onwards. Most astonishing was the quick establishment on the financial markets. This is particularly true for the position on the Eurobond market, where the ECU became the third most important currency only two years after the first ECU issue had been

floated. More recently, this success story was interrupted by a few setbacks. For example, the volume of Eurobonds denominated in ECU began to stagnate.

Against this background it is interesting to look at the attractiveness of an investment in ECU bonds, in comparison with bonds denominated in major investment currencies, and the change of this attractiveness over time. This is done by breaking down the period of analysis into two subperiods (August 1983 to June 1985 and June 1985 to June 1987). It turns out that in the second subperiod the ECU investment lost attractiveness in terms of total return when compared with its strongest 'competitors', namely bonds denominated in one of the European hard currencies (Swiss franc, D-mark, and guilder). To a very large extent this is due to the depreciation of the pound Sterling, alongside the US currency, against the hard currencies in 1986. With this exception the comparatively higher yield on ECU bonds proved sufficient to compensate for the risk of devaluation by the weaker currencies in the ECU basket. Hence any attempt to stabilize the exchange rate between the pound and the D-mark should enhance the attractiveness of ECU bonds. For the period as a whole ECU bonds had roughly the same total return as bonds denominated in one of the European hard currencies.

Most attractive seems to be the low-risk feature of an investment in ECU bonds, i.e. the comparably small fluctuations of total return emanating from interest rate and exchange rate movements over time. In addition, the comparably high capability of an ECU investment to reduce the overall portfolio risk, when ECU bonds are included in an internationally diversified portfolio, deserves attention. These features are a consequence of the ECU's construction as a basket of ten currencies. This is most easily appreciated when the possibility of short-selling is taken into account. The investor should then build up short positions in the component currencies of the ECU basket and invest the proceeds in ECU bonds. Not surprisingly, the share of ECU bonds in an efficiently diversified bond portfolio can become fairly large. However, even in the absence of short-selling, most investors will find the inclusion of ECU bonds attractive. In that case the typical share of ECU bonds lies in the range of 5 to 10% of the overall bond portfolio.

Footnotes

- ¹ The presence of a trend in the exchange rate (appreciation or depreciation) exerts, in general, an influence on volatility as measured here (see section 5).
- ² For a more thorough discussion of this issue, see BIS, July 1986.
- ³ Source: Salomon Brothers. Note that the average maturity of the bonds included in the respective baskets is approximately the same, but this is not the case for duration.
- ⁴ See MARKOWITZ, H. M. (1952, 1959), and SZEGO, G. (1980).
- ⁵ The respective variance-covariance matrices are available from the author upon request.
- ⁶ The components (shares) of these portfolios are computed as follows: $(M^{**}-1^*E)/(E^{**}-1^*E)$, where M is the variance-covariance matrix of total return and E is the unit vector.
- ⁷ See also HAMAUI (1985), p. 12.

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