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REVISION OF THE SDR:
AN EXTERNAL CONSEQUENCE OF EUROPE'S MONETARY UNION

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Revision of the SDR:
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Abstract

In this paper I consider a revision of the IMF's Special Drawing Rights (SDR) that may result from the adoption of the European Currency Unit (ECU) by the European Community in their program of Monetary Union. I develop data representing the monthly average exchange value for this new basket I call the SDR(ecu). This data is compared to the actual SDR series for the period January 1981 through December 1990. While these two baskets maintain essentially similar values over the period in question, the percentage rate of change in the SDR(ecu) is found to have a significantly smaller volatility than the SDR (as found by an Analysis of Variance test). Using Sharpe's Index Model (1970) (a modified version of the capital asset pricing model) the reduced exchange rate risk is decomposed into components of "systematic" and "non-systematic" risk. The result I find suggest that although the overall exchange rate risk is small in the SDR(ecu), this risk is much more composed of the non-diversifiable "systematic" risk, than is the SDR. This leads me to recommend that a revision of the SDR to my SDR(ecu) would be an improvement over the existing arrangements. Second, the adoption of a coordinated effort among the G-3 (Dollar, Yen and ECU) monetary authorities, such as an exchange rate mechanism, would help manage the relative increase in "systematic" exchange risk. These recommendations would enhance the position of both the SDR and ECU as international reserve currencies.

JEL classification numbers: E42, E58, F02, F31, F33, and F36.

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1. The Role of the ECU in the International Monetary System

In August 1990 the European Commission announced its final plans for the establishment of a community wide central bank by 1 January 1994.¹ The establishment of a unified monetary authority in Europe heightens the likelihood that the European Currency Unit (ECU) will replace Europe's national currencies in the near future.

The present paper examines the implications for the valuation and composition of the Special Drawing Rights (SDR) due to the replacement of Europe's national currencies by the ECU. The major questions that should be asked about the revision of the SDR due to the rise of the ECU are the following: How well will it behave? Will it generate a significantly different SDR series? Will that series be more or less volatile than the current SDR? Will the revised SDR promote greater order and stability for the international monetary system? Or will the current level of "stability" be lost by such a move?

The initial purpose behind the creation of the SDR was the establishment of a stable alternative means of settling

¹ See DuBois, M. (August 22, 1990) and Ungerer, H., et. al. (1990) p.49.

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international payments, besides the dominate use of the Dollar and the fading use of gold. Since 1 January 1981 the SDR has consisted of a basket of the currencies of the five countries having the largest shares of international trade and finance. The five currencies are the U.S. Dollar, the Japanese Yen, the German Deutsche mark, the French Franc and the British Pound Sterling. With the complete adoption of the ECU, and the subsequent elimination of Europe's national currencies, there must come a change in the composition of the SDR.

The paper is organized as follows: In section 2 I will examine the weighting scheme used by the IMF for the composition of the SDR. Using the sum of the weights currently assigned to the European currencies, I calibrate the currency weight of the ECU in what I refer to as the SDR(ecu). In section 3 I shall present the summary statistics of my newly computed series of SDR(ecu) exchange rates and the percentage rate of change in the series' exchange rate values. Section 4 examines the F statistic which is a measure of relative volatility I find that the series SDR(ecu) is not significantly different from the actual IFS² series SDR. However, when this test is applied to the percentage

² The International Financial Statistics, published by the IMF.

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rate of change series I find that the SDR(ecu) contains a significantly smaller measure of variation than the actual SDR. This is explained by the smoothing effect the ECU has relative to its three main currencies that are in the SDR basket.

Section 5 goes on to examine more closely some of the characteristics of the volatility in the rate of change of the SDR(ecu). To accomplish this I employ the Sharpe Index Model, a version of the Capital Asset Pricing Model, that decomposes risk into "Systematic" and "Non-Systematic" components. The results of this analysis find that, while overall exchange rate volatility for the SDR(ecu) is less than or equal to that found in the actual SDR, the ratio of "Systematic" to "Non-Systematic" risk in the SDR(ecu) is greater than found in the actual SDR. In section 6 I make a general policy recommendation that "when the ECU replaces the European Currencies currently in the SDR Basket, an active exchange rate mechanism should be established among the G-3 (the EC, Japan and the US) in order to more effectively manage the increase in "Systematic" exchange rate risk." Such a policy would further reduce the exchange rate volatility beyond the level of reduction that is brought about by the simple ECU revision of the SDR basket.

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2. Weighting the SDR Basket

From its start in 1967 until July 1974 the SDR exchange rate was fixed to the values of both gold and the Dollar. With the collapse of the Bretton Woods Fixed Exchange Rate system and the non-convertibility of the Dollar to gold, the IMF decided to evaluate the SDR as a standard weighted basket of currencies. In 1974 this standard basket was developed using a selection criteria that qualified any country having 1% or more of the world total of exports. Weights for this basket were then estimated as the relative shares of export trade of these countries over the preceding five years. The IMF recalibrated the weights and country composition of the SDR by the same criteria in 1978. While the IMF intended that this 1978 basket would be utilized until a third recalibration would take place in 1983, the SDR was instead revised significantly on 1 January 1981.

The 1981 revision of the SDR was fundamental in two important aspects. First, the selection of country composition was revised since the 1% rule would have increased the number of countries in the basket. Instead it was decided that the basket would consist only of the five largest exporters, as the difference in the share of exports by other countries was significantly smaller in size

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than any of the top five. Second, the criteria used for the estimation of weights would involve not only the relative measure of trade importance, but would also involve a measure of the importance of the currencies to international finance. The size of holdings of these currencies as reserve assets by all the members of the IMF was used as a proxy of the currency's importance to international finance.

The weights estimated in percentage terms were then translated into "currency weights" in order to make the value of the SDR on 1 January 1981 under the five currency basket exactly equal to its value under the sixteen currency basket on that day. In 1986 these percentage weights were recalibrated for the five currencies, and similar "currency weights" were computed so that the value of the SDR on 1 January 1986 would be identical regardless of which set of weights were used. Table 1 presents the percentage weights estimated for the 1981 and the 1986 baskets as well as the corresponding "currency weights" (for conversion into the Dollar value of the SDR) for the two periods.

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TABLE 1
OFFICIAL SDR WEIGHTS

Country	1981 % weights	1981 currency weights (in \$)	1986 % weights	1986 currency weights (in \$)
U.S.	42%	0.54	42%	0.425
Japan	13%	34.0	15%	33.4
Germany	19%	0.46	19%	0.527
France	13%	0.74	12%	1.02
U.K.	13%	0.0710 ³	12%	0.0893

Source: Annual Report of the Executive Board for the Financial Year Ended April 30, 1981, and 1986, International Monetary Fund, Washington, D.C.

After 1994 the elimination of the national currencies of Europe will affect between 43 to 45% of the recent SDR baskets. If the same selection criteria were to be used for an SDR consisting of ECUs in place of the Deutsche mark, Franc and Pound, then the SDR would be composed of only three currencies. The process of estimating the basket weights for these three currencies would be faced with a unique situation. Either the trade statistics would need to be regional rather than national,

³ The currency weight for the U.K. is multiplied by the Dollar value of the Pound, whereas for all other currencies their currency weights are divided by their respective value of the Dollar. In other words the exchange rates used for all currencies except the Pound are quoted in European terms, while the Pound is quoted in American terms.

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or the weighting criteria would be inconsistently balanced by the use of national trade statistics and a set of international (regional) currency statistics. If the trade statistics to be used are regional, then the matter of trade to be measured should be the trade external to the EC since the internal market being established is to be considered a single market.

Foregoing an examination of such a revision of percentage weights of an SDR composed of the Dollar, the Yen and the ECU, I shall simply assume that the ECU percentage would be equal to the sum of the weights given to the Pound, Franc and Deutsche mark. Table 2 presents the revised country currency weights for the SDR(ecu). Using the percentage weights for the SDR(ecu) presented in Table 2, I calibrated an initial "currency weight" for the ECU so that the resulting SDR(ecu) would be exactly equal to the value of the SDR (employing the five currency basket) for January 1981. Subsequently, for the recalibration of the percentage and "currency weights" that were made in January 1986, I followed the practice of the IMF in estimating the ECU's "currency weight" by

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insuring that the 1 January 1986 value of the SDR(ecu) was the same whether calculated using the 1981 "currency weights" or using the new "currency weights" for 1986 forward.⁴

Country	1981% weights	1981 currency weights (in \$)	1986% weights	1986 currency weights (in \$)
U.S.	42	0.54	42%	0.152
Japan	13%	34.0	15%	33.4
ECU	45%	0.4548441	43%	0.53872264

Table 3 presents the official country composition of the ECU in percentage terms, and relates the effective national weights of these countries on the SDR(ecu). The ECU like the SDR requires that these percentage weights be translated into "currency weights" at a particular point in time. The effect of such a computational method of adopting fixed currency amounts leads to

⁴ Recently, new weights became effective (1 January 1991, a period not covered in this paper):

	%	Currency weight	which would imply	%
US\$	40	0.572		US\$ 40
DM	21	0.453		ECU 43
Yen	17	31.8		Yen 17
Fr	11	0.800		
Pd	11	0.0812		

Source: IMF Survey, 21 January 1991, p.23.

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deviations from these "official" percentage weights when the underlying exchange rates fluctuate. Thus, since complete monetary sovereignty has not yet been released to the EMS by its members, their discretion in monetary policy may influence the valuation of the SDR(ecu) (see Table 3).

TABLE 3						
NATIONAL CURRENCY WEIGHTS OF THE ECU UPON THE SDR(ECU)						
Country	13/3/79-14/9/84		17/9/84-21/9/89		21/9/89 to Date	
	ECU%	Effective SDR%	ECU%	Effective SDR%	ECU%	Effective SDR%
Germany	33%	14.85%	32%	14.4%	30.53	13.1279
France	19.8%	8.91%	19%	8.55%	19.43	8.3549
U.K.	13.3%	5.985%	15%	6.75%	12.06	5.1858
Holland	10.5%	4.725%	10.1%	4.545%	9.56	4.1108
Italy	9.5%	4.185%	10.2%	4.59%	9.92	4.2656
Belgium						
-Luxembourg	9.7%	4.365%	8.5%	3.825%	7.83	3.3669
Spain					5.18	2.2274
Denmark	3.1%	1.395%	2.7%	1.215%	2.53	1.0879
Ireland	1.1%	0.495%	1.2%	0.54%	1.12	0.4816
Portugal					0.78	0.3354
Greece			1.3%	0.585%	0.77	0.3311

Source: Eurostat: Section 2B.

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3. Summary Statistics of the SDR(ecu) and SDR.

The data used in this paper consist of monthly average values of the SDR as published in various issues of International Financial Statistics, and a self generated series for the SDR(ecu) for the period beginning January 1981 and ending December 1990.⁵ The data used to generate the SDR(ecu) series used monthly average exchange rates for all national currencies as published in various issues of International Financial Statistics, for values of the ECU monthly average data was taken from Eurostat: Monthly External Trade Bulletin published by the European Economic Community.

As pointed out in Section 2 above, since the Deutsche mark, the Franc and the Pound are the three weighted currencies in the ECU their replacement in the SDR basket only moderates their influence on the resulting SDR(ecu) due the rigid EMS Exchange Rate Mechanism. Accordingly we should not expect that the IMF's monthly average series of the SDR would be in any major way different from the series I generated for the monthly average SDR(ecu). The summary statistics presented in Table 5 do seem to confirm these expectations. Likewise, the time series plots of

⁵ Copies of the SDR(ecu) series are available from the author upon request.

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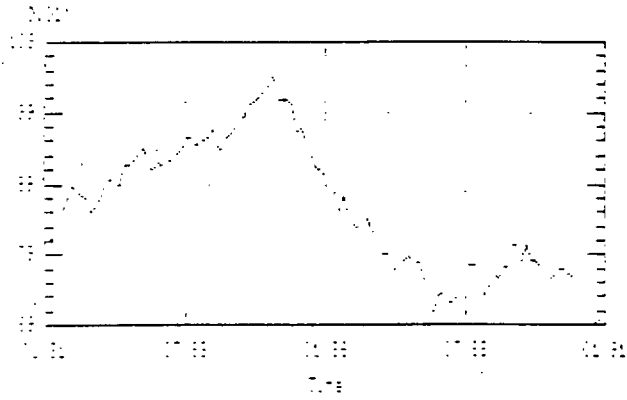
these series present relatively insignificant differences between the SDR and the SDR(ecu) (see Figure 1 a-f).

TABLE 4 STATISTICAL COMPARISON OF SDR AND SDR(ECU)					
Currency Base	Mean	Variance	Maximum	Minimum	Range
SDR/S SDR(ecu)/S	0.853219 0.851948	8.59766 E-3 8.89326 E-3	1.0423 1.03689	0.692132 0.688579	0.35016 0.34831
SDR/Yen SDR(ecu)/Yen	4.6650E-3 4.6559E-3	6.17868E-7 6.0404 E-7	6.0107E-3 5.9559E-3	3.4683E-3 3.444 E-3	2.54E-3 2.51E-3
SDR/DM SDR(ecu)/DM	0.391318 0.390536	1.52633 E-3 1.43111 E-3	0.469846 0.466723	0.30484 0.313202	0.16501 0.15352
SDR/Fr SDR(ecu)/Fr	0.127419 0.127166	1.94995E-4 1.8484 E-4	0.173179 0.169974	0.0997683 0.102505	0.07341 0.06747
SDR/Pd SDR(ecu)/Pd	1.37184 1.36932	0.0266304 0.0259258	1.93292 1.89715	1.13027 1.13648	0.80265 0.76067
SDR/ecu SDR(ecu)/ecu	0.874793 0.873936	0.0646403 0.0657308	1.54281 1.53646	0.501182 0.498609	1.04163 1.03785

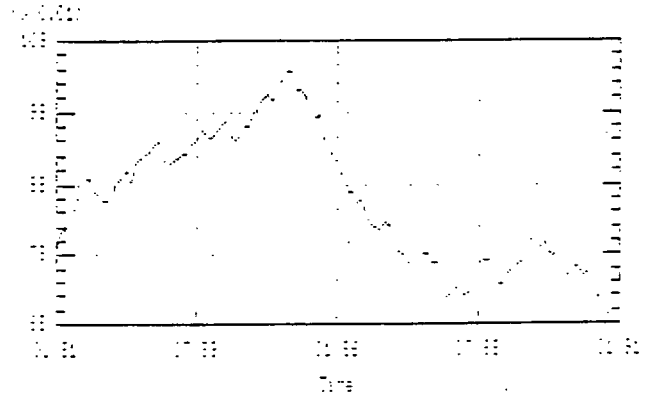
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FIGURE 1 A-C

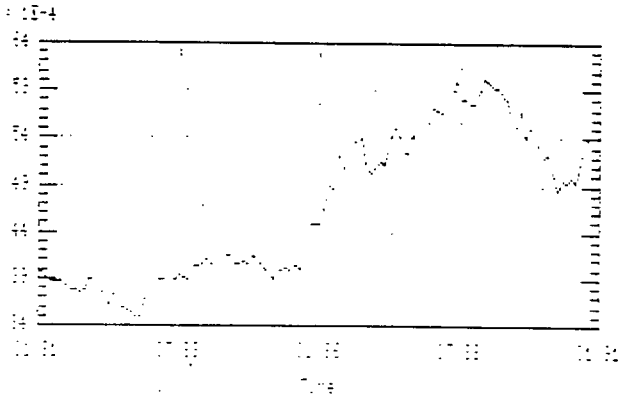
A.1 SDR/\$



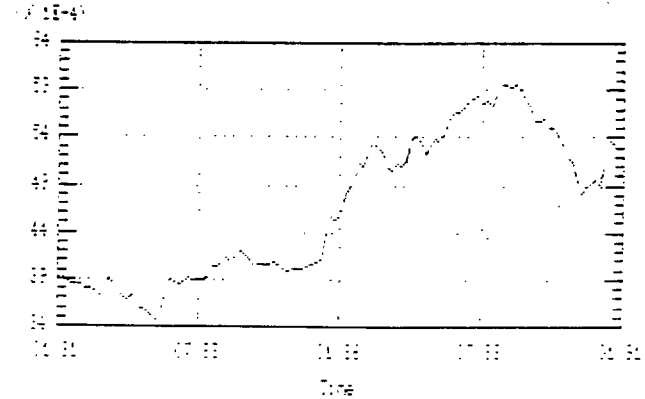
A.2 SDR(ecu)/\$



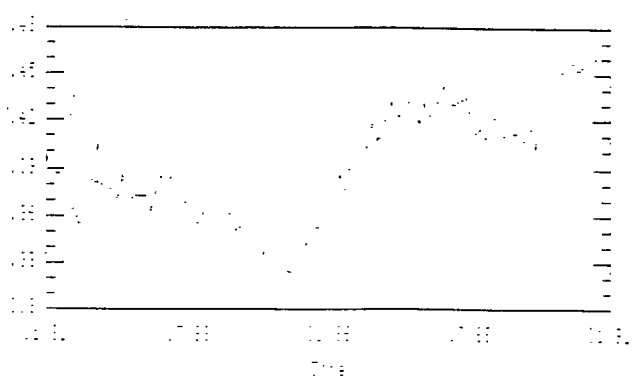
B.1 SDR/Yen



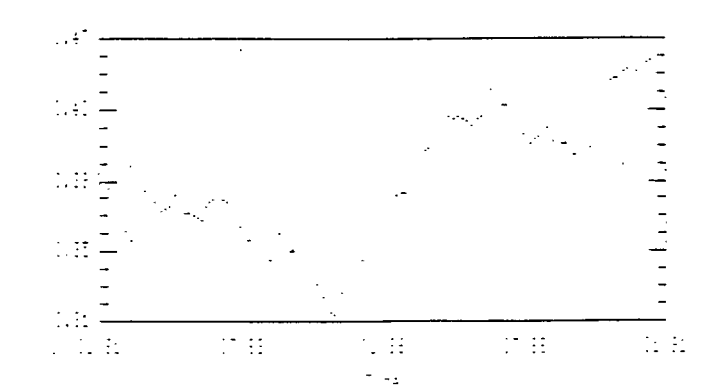
B.2 SDR(ecu)/Yen



C.1 SDR/DM

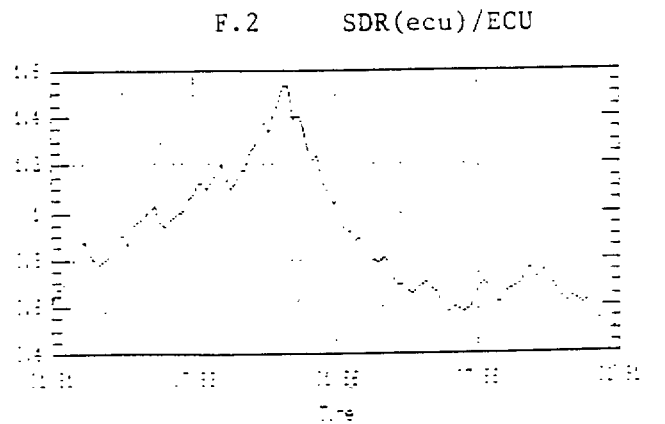
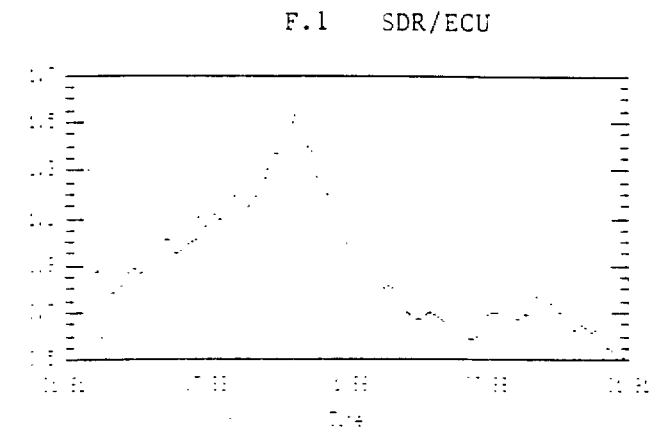
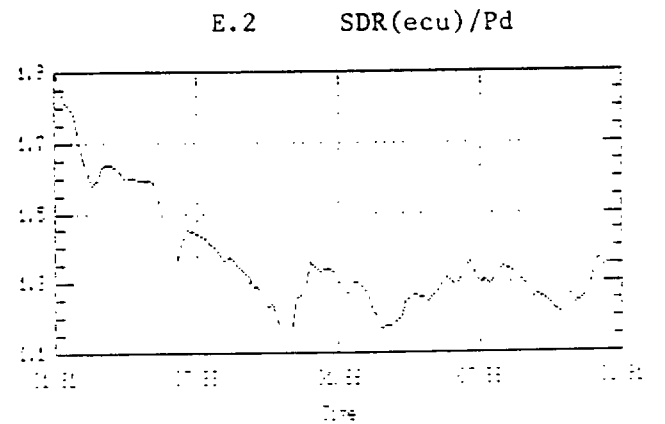
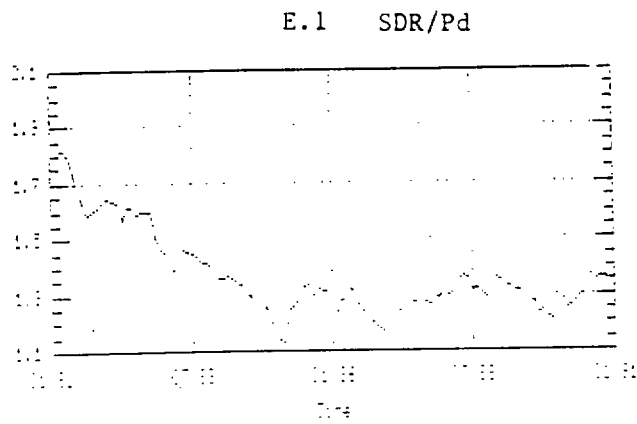
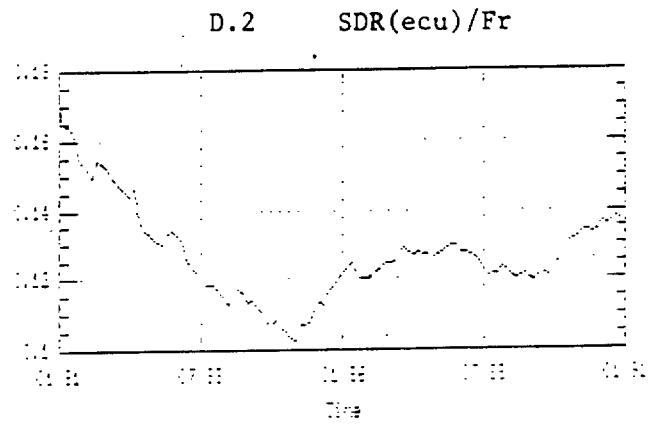
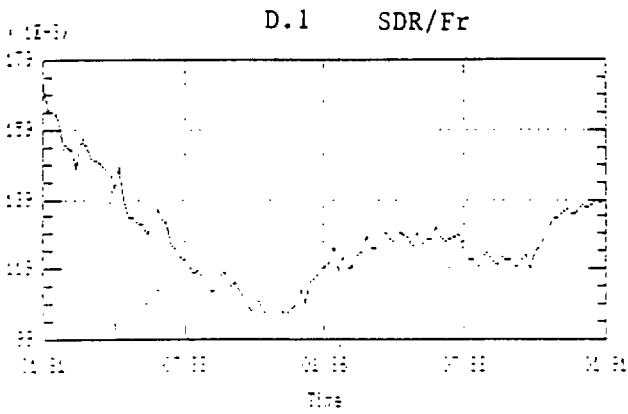


C.2 SDR(ecu)/DM



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FIGURE 1 D-F



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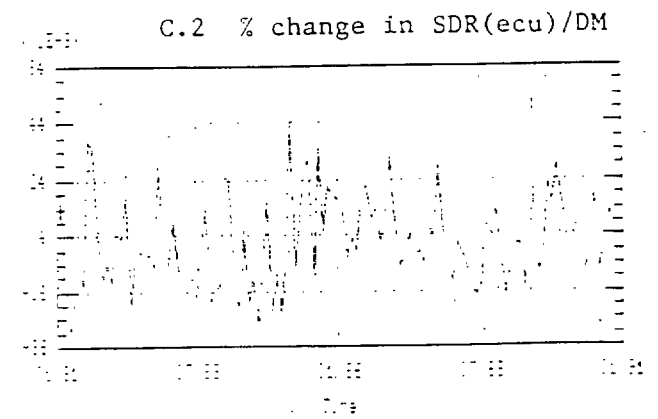
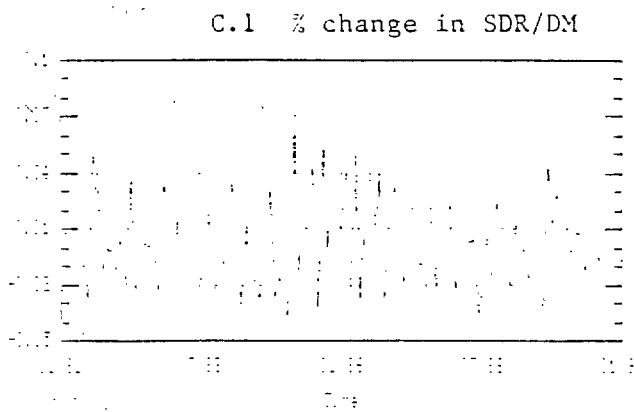
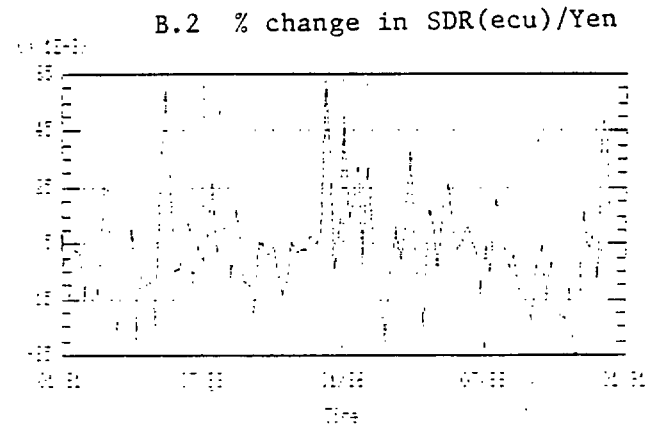
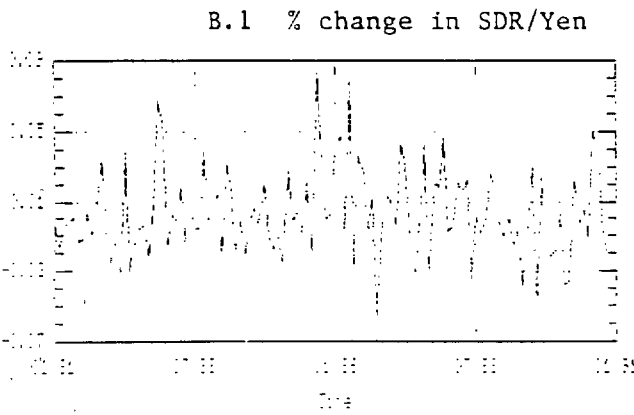
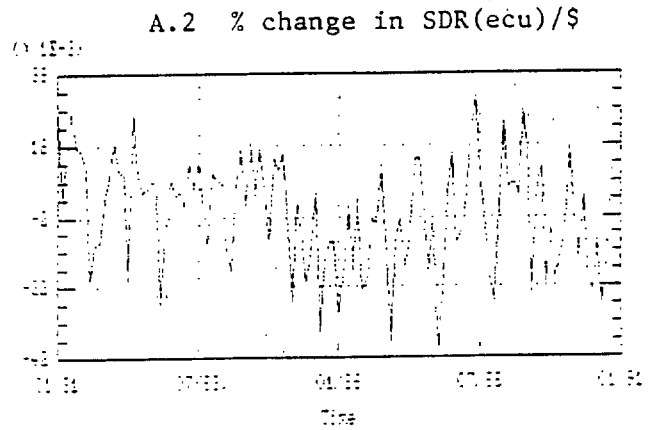
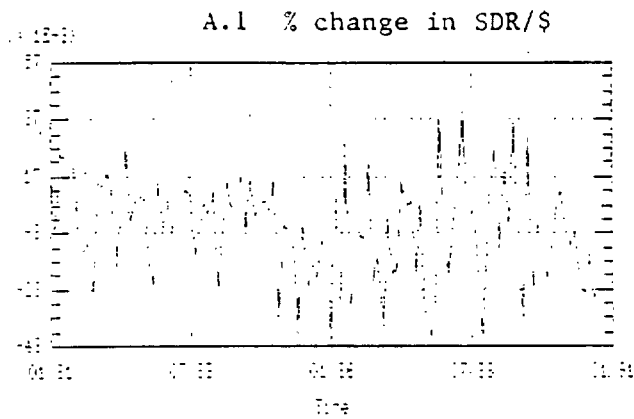
While a basic similarity is evident in these monthly exchange rate values the question remains "what does a descriptive presentation is the relative volatility of the SDR versus the SDR(ecu) present? Greater or lesser volatility?" To answer this I present Table 5 which contains the summary statistics of the percentage rate of change for the twelve exchange rates. The average values of these exchange rate do appear to have only insignificant differences between the SDR and SDR(ecu). However, we also find that for all base exchange rates, except the ECU, the variance of the SDR is greater than that found in the SDR(ecu) (see also Figure 2 a-f). A more convincing answer my question in terms of statistical confidence can be provided by the Analysis of Variance (ANOVA) F-test statistic. This inferential test will be examined in the following section.

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TABLE 5					
STATISTICAL COMPARISON THE PERCENTAGE CHANGE IN SDR AND SDR(ECU)					
Currency Base	Mean	Variance	Maximum	Minimum	Range
SDR/S	-1.149E-3	3.37131 E-4	0.0409937	-0.042133	0.08313
SDR(ecu)/S	-1.048E-3	2.41553 E-4	0.0317829	-0.041214	0.07299
SDR/Yen	2.3279E-3	6.75766 E-4	0.0869709	-0.061772	0.14874
SDR(ecu)/Yen	2.4288E-3	3.54161 E-4	0.0627098	-0.034826	0.09753
SDR/DM	1.3451E-3	6.04086 E-4	0.0709344	-0.048606	0.11954
SDR(ecu)/DM	1.4460E-3	2.55159 E-4	0.0447153	-0.035282	0.07999
SDR/Fr	-1.886E-3	6.4061 E-4	0.0718738	-0.065560	0.13743
SDR(ecu)/Fr	-1.785E-3	2.77718 E-4	0.0456546	-0.061127	0.10678
SDR/Pd	-3.011E-3	5.9201 E-4	0.103541	-0.055009	0.15855
SDR(ecu)/Pd	-2.910E-3	3.83947 E-4	0.0773214	-0.039	0.11632
SDR/ecu	-1.661E-3	1.75553 E-3	0.0837216	-0.102661	0.18638
SDR(ecu)/ecu	-1.560E-3	1.89654 E-3	0.0941479	-0.104759	0.19890

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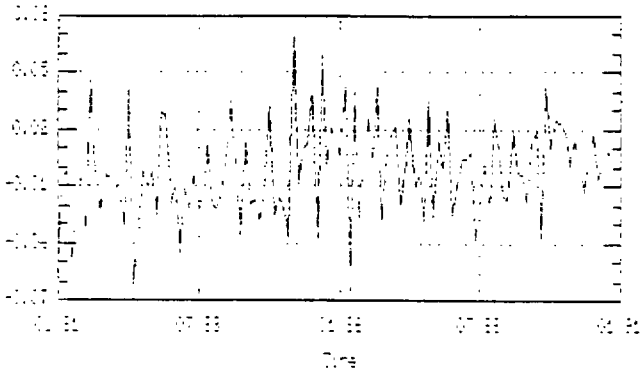
FIGURE 2 A-C



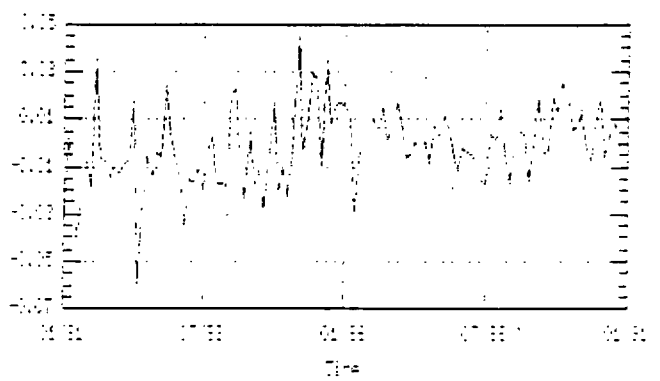
The ECU Revision of the SDR

FIGURE 2 D-F

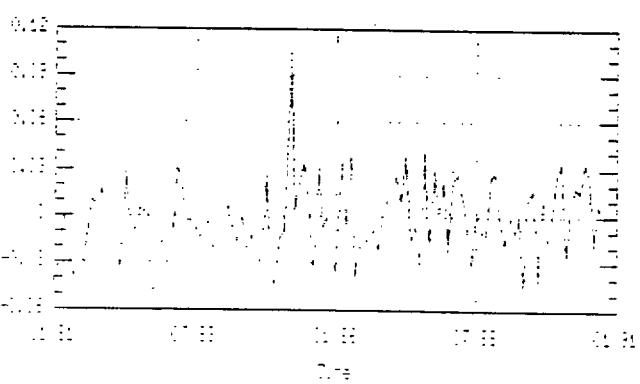
D.1 % change in SDR/Fr



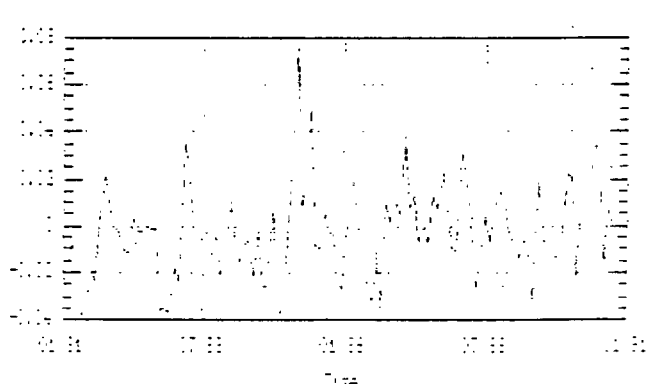
D.2 % change in SDR(ecu)/Fr



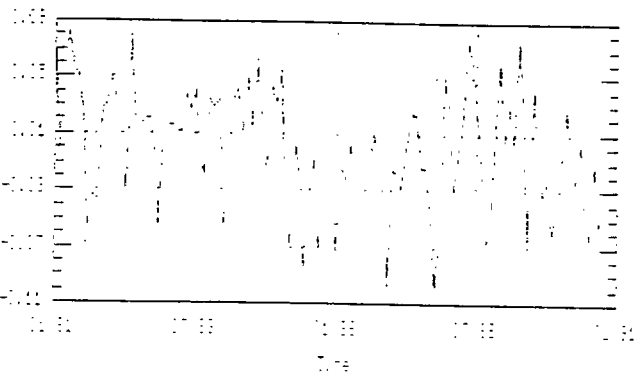
E.1 % change in SDR/Pd



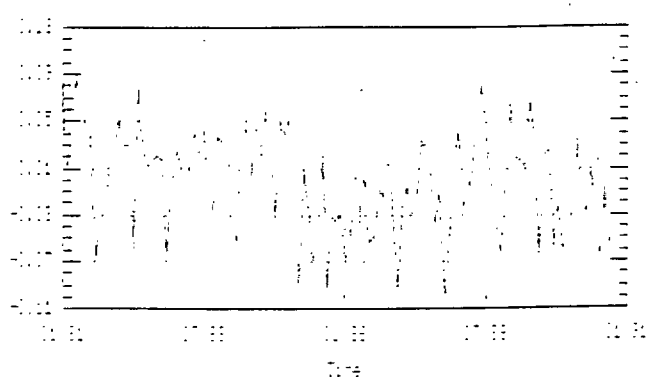
E.2 % change in SDR(ecu)/Pd



F.1 % change in SDR/ECU



F.2 % change in SDR(ecu)/ECU



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4. An Inferential Test For the Magnitude of Exchange Risk

Moulton (1977), McFarland, et. al. (1982), Pozo (1982) and (1987) found that "theoretically" exchange rate changes are better described by the symmetric stable Paretian (SSP) distribution. Given the properties of this distribution the second and higher moments of the SSP distribution may be infinite, thus the conventional sample variance would not be a meaningful measure of dispersion. This has the implication that an "F-Test" would be an inappropriate test of relative dispersion as it is based on the ratio of variances. However, what Pozo (1987) fails to point out after presenting her computations of an SSP dispersion statistic is that the conclusions reached by her SSP statistic is consistent with the conclusions that would be drawn from the "F-Test" on the same data. Since the instrumental conclusions are not significantly different I have chosen to forgo an examination of the data in terms of their SSP statistics, and simply apply the more conventional F-test.⁶

⁶ Another popular statistical procedure that is related the issue of volatility concerns the nature of this data as being generated by a "random walk" process. The Dickey-Fuller Test for a "unit root" was examined for the series of SDR, SDR(ecu) and the percentage rate of change in the SDR and SDR(ecu). The result found "unit roots" for these series which may be interpreted at support for the random walk hypothesis. However, as Hakkio (1986) has demonstrated in a monte carlo framework the results of the

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The ANOVA F-test examines the null hypothesis that the variances of two samples are statistically equivalent. If the ratio of the two sample variances is greater than the critical value of F (given the degrees of freedom of the two samples and a specified level of significance), then the null hypothesis should be rejected in favor of the alternative hypothesis - that one variance is greater than the other.

The results displayed in the first column of Table 6 are the computed ratios of the variances of the actual exchange rate of SDRs (in terms of national currencies and the ECU) divided by the variances of the exchange rate of the SDR(ecu) (in terms of national currencies and the ECU). These values are all found to be less than the critical value of F (given 119 degrees of freedom for both the numerator and the denominator at a 5% significance level which is $F=1.35$). This suggests that in terms of comparing the variances of the SDR series to the variances of the SDR(ecu) series, there is statistically no significant difference.

Dickey-Fuller Test are biased in favor of the random-walk hypothesis and consequently should be qualified only as a weak test.

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TABLE 6 F-TEST ANALYSIS OF VARIANCES OF SDR AND SDR(ECU)		
Currency Base	Exchange Rate Variances	Percentage Rate of Change Variances
SDR/\$ SDR(ecu)/\$	0.9671*	1.3966
SDR/Yen SDR(ecu)/Yen	1.0229*	1.9088
SDR/DM SDR(ecu)/DM	1.0665*	2.3675
SDR/Fr SDR(ecu)/Fr	1.0551*	2.3068
SDR/Pd SDR(ecu)/Pd	1.0270*	1.5421
SDR/ecu SDR(ecu)/ecu	0.9834*	1.0803*

* These F values fall below the critical $F=1.35$ (given the 119 or 113 degrees of freedom) at the 95% confidence level. This implies that the null hypothesis (that the variances are equal) should not be rejected.

The results displayed in the second column of Table 6 are the computed ratios of the variances of the percentage rate of change in the exchange rate of the SDR divided by the variance of the percentage rate of change in the exchange rate of the SDR(ecu) (both in terms of national currencies and the ECU). These values

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suggest that for all currencies except the ECU, the relative volatility of the percentage rate of change in the SDR is larger than the volatility of the percentage rate of change in the SDR(ecu). This is an important result because it suggests that the monthly volatility of the SDR(ecu) (in percentage terms) is smaller than for the SDR at a statistical level of significance of less than 5%. In other words, between national currencies and the SDR(ecu) we should expect to find less month to month exchange risk, than between national currencies and the SDR.

The reduction in exchange risk is unambiguous in terms of all national currencies, but not in terms of the ECU. Accordingly, if the national currencies of Europe are replaced by the ECU, the US and Japan will enjoy a reduction in exchange risk with the SDR(ecu) replacing the SDR; but the Europeans may not. This conclusion raises another question: "What is the relative composition of this reduced exchange risk?" "Is it more or less "systematic" (i.e., non-diversifiable)?" The next section will address these questions.

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5. Decomposition of Exchange Rate Risk in SDR(ecu) and SDR

Roll and Solnik (1977) developed and examined an extension to the Mean-Variance Capital Asset Pricing Model (CAPM) to the market for foreign exchange assets. This model decomposes the various exchange rate investment opportunities into the standard CAPM components of "systematic" and "non-systematic" risk, as computed from a simple regression estimate. Van Den Boogaerde (1983?) extended the CAPM framework to the possible use of "Private SDRs". Both of these studies look at the full asset opportunity of exchange currencies and investing in the various money markets associated with each currency. While these approaches are important for a comprehensive analysis of alternative investment opportunities, as my interest is not that broad, I shall employ a simpler but related model - the Sharpe Index Model (1970).

The Sharpe Index Model employs the following equation

$$(1) \quad I_{ij} = \alpha_{ij} + \beta_{ij}I_{Ij} + \epsilon_{ij}$$

where I_{ij} = the value of an index for currency i denominated in terms of currency j; I_{Ij} = the value of the weighted market index in terms of currency j; ϵ_{ij} = error term of the regression; α_{ij} = intercept parameter; β_{ij} = slope parameter. Using the estimates obtained from this equation the risk components can be calculated as follows:

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(2) SYSTEMATIC RISK $SR = \sqrt{\sigma_{ij}^2 \sigma_{Ij}^2}$

(3) NON-SYSTEMATIC RISK $NSR = \sqrt{\frac{\sigma_{\epsilon ij}^2}{N - 1}} = \sqrt{\frac{(SER)^2}{N - 1}}$

The standard deviation of each country variable can be found as

(4) TOTAL RISK $TR = \sqrt{\frac{\sigma_{ij}^2}{N - 1}}$ or $SR + NSR$.

Accordingly, the decomposition of total risk into its systematic and non-systematic components may be expressed in percentage terms by dividing (2) and (3) by (4) respectively. The proxy variables used in the present analysis are the following; I_{ij} = the percentage rate change in the exchange rate of currency i in terms of currency j (for the five national currencies and the ECU); I_{Ij} = the percentage rate change in the exchange value of either the SDR or SDR(ecu) in terms of currency j (for the five national currencies and the ECU). The results of the decomposition of risk from the 60 regressions are reported in Tables 7-A and 7-B.

I will now summarize briefly the results of the decomposition of risk by describing two basic categories. The first category is identified by the base currencies of the US Dollar and the ECU. In this category there is an unambiguous increase in the percentage of systematic risk associated with the SDR(ecu) as opposed to the SDR. This result seems quite logical since the

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change in the composition from the SDR to the SDR(ecu) entails maintaining a 40% make up by the Dollar and a 45% make up by the ECU. Since the SDR(ecu) is thus over 80% either US Dollar or ECU, all other national exchange rates denominated by either Dollar or ECU are bound to have a strong systematic relationship to the variance of the SDR(ecu).

The second category is identified by the remaining base currencies; the Yen, DM, Fr, and Pound. In this category the results are both mixed and moderate. For each of these currency bases we find both increases and decreases in the percentage rate change of systematic risk in comparison of the SDR and SDR(ecu). The fact that these results are ambiguous and moderate in terms of the four other national currencies can be explained by the relatively minor role they each play in the SDR(ecu); either directly, like the Yen, or indirectly through their inclusion in the ECU basket. However, regardless of the change in systematic risk, the magnitudes are small.

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TABLE 7-A				
PERCENTAGE DISTRIBUTION OF SYSTEMATIC AND NON-SYSTEMATIC RISK OF SIX CURRENCIES AGAINST THE SDR AND SDR(ECU)				
Countries of Exchange	Percentage of Systematic Risk		Percentage of Non-Systematic Risk	
	SDR/\$	SDR(ecu)/\$	SDR/\$	SDR(ecu)/\$
United States	-	-	-	-
Japan	18.87%	24.56%	81.11%	75.44%
Germany	18.58%	22.94%	81.42%	77.06%
France	19.22%	32.17%	80.78%	67.83%
United Kingdom	19.37%	21.45%	80.63%	78.55%
E.M.S.	19.74%	39.23%	80.26%	60.77%
	SDR/Yen	SDR(ecu)/Yen	SDR/Yen	SDR(ECU)/Yen
United States	29.67%	30.27%	70.33%	69.73%
Japan	-	-	-	-
Germany	23.77%	20.55%	76.23%	79.45%
France	24.18%	22.16%	75.82%	77.84%
United Kingdom	25.46%	21.51%	74.54%	78.49%
E.M.S.	27.48%	22.21%	72.52%	77.79%
	SDR/DM	SDR(ecu)/DM	SDR/DM	SDR(ecu)/DM
United States	35.52%	36.71%	64.48%	63.29%
Japan	27.22%	25.51%	72.78%	74.49%
Germany	-	-	-	-
France	26.14%	23.99%	73.86%	76.01%
United Kingdom	28.02%	24.43%	71.98%	75.57%
E.M.S.	31.65%	27.71%	68.35%	72.29%

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TABLE 7-B				
PERCENTAGE DISTRIBUTION OF SYSTEMATIC AND NON-SYSTEMATIC RISK OF SIX CURRENCIES AGAINST THE SDR AND SDR(ECU)				
Countries of Exchange	Percentage of Systematic Risk		Percentage of Non-Systematic Risk	
	SDR/Fr	SDR(ecu)/Fr	SDR/Fr	SDR(ecu)/Fr
United States	31.14%	35.29%	68.86%	64.71%
Japan	23.21%	18.25%	76.79%	81.75%
Germany	21.80%	15.70%	78.20%	84.30%
France	-	-	-	-
United Kingdom	23.93%	17.69%	76.07%	82.31%
E.M.S.	30.13%	30.74%	69.87%	69.26%
	SDR/Pd	SDR(ecu)/Pd	SDR/Pd	SDR(ecu)/Pd
United States	29.67%	30.27%	70.33%	69.73%
Japan	23.03%	22.91%	76.97%	77.09%
Germany	22.15%	20.94%	77.85%	79.06%
France	22.53%	22.91%	77.47%	77.09%
United Kingdom	-	-	-	-
E.M.S.	26.62%	22.70%	73.38%	77.30%
	SDR/ecu	SDR(ecu)/ecu	SDR/ecu	SDR(ecu)/ecu
United States	56.16%	83.52%	43.84%	16.48%
Japan	49.61%	60.45%	50.39%	39.55%
Germany	50.03%	60.75%	49.97%	39.25%
France	54.16%	75.19%	45.84%	24.81%
United Kingdom	51.83%	59.19%	48.17%	40.81%
E.M.S.	-	-	-	-

Consideration of the increased percentage of systematic risk in the two major currencies of the SDR(ecu) (the Dollar and the ECU) should lead us to policy considerations which might further

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coordinate the exchange values of these two currencies so that although the percentage of systematic risk may be greater the general magnitude of exchange risk overall may be reduced. Such a reduction in the overall magnitude of exchange risk has already occurred among the EMS currencies, as Pozo (1987) has demonstrated, and would have occurred with the SDR(ecu) as I demonstrated in section 3 above.

6. Conclusions and general policy recommendations

This paper set out to examine the effect on the valuation of the SDR caused by the abolishment of the national currencies of Europe and their replacement with the ECU. Having evaluated the basic weighting scheme of the SDR I developed corresponding weights for an SDR(ecu) and generated a series of monthly data for the SDR(ecu) for the periods 1/81 through 12/90. After making a comparison of the data for the monthly series of SDR and SDR(ecu) I reach the conclusion that there is only a minor (not statistically significant) difference between these two samples. However, when examining the percentage rate of change in these exchange rates I found that the SDR(ecu) possesses a significantly smaller degree of volatility than is found in the actual SDR over

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the same period.

The exchange rate discipline of the European Monetary System has reduced the volatility of the component currencies of the ECU relative to each other. However, the aggregate volatility of the ECU relative to the Yen and the Dollar is not as significantly improved. Yet, the reduced volatility embodied in the ECU can be shared with the Dollar and the Yen as evidenced by a comparison of the variance of the SDR against variance of the SDR(ecu). As one of the primary goals of the IMF in establishing the SDR was to prove a vehicle for exchange rate stability, the replacement of the European currencies by the ECU in the valuation of the SDR would not significantly change (improve or worsen) the variability of the component currencies of the SDR, however it would reduce the overall variance of the SDR.

In a proactive stance on the part of the IMF, an accelerated timetable of the ECU revision of the SDR could accomplish four net improvements in the functioning of the current international monetary system:

1. A reduced volatility of the rate of change in the SDR(ecu) relative to its component and immediately related currencies;
2. A logical linkage of the SDR and ECU as international

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reserve assets;

3. Enhancement of the positions of both the ECU and the SDR as units of account in the private markets, as well as between central banks;⁷ and

4. There will be an initial saving brought about by the overall reduction in the size of reserve holdings during the conversion to the ECU gained by holders of the present 12 EMS currencies.

However, without an explicit program of monetary coordination similar to the exchange rate mechanism that has operated under the EMS, the above gains in decreased volatility may be lost to relative proportion of "Systematic" volatility among the G-3 currencies.

As the SDR will need to be reconstituted in the near future, due to the ECU, the IMF will have to look for more than just a change in the composition of the SDR to insure net improvements in exchange rate stability. The adoption of intervention policies similar to those used by the EMS could provide greater stability to the SDR; the adoption of a commodity basket index⁸ would be a

⁷ See also the recent discussion on enhancing the SDR in Coats (1990).

⁸ I would like to thank Warren Coats for bringing this

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more radical departure, but could provide avenues for greater overall world price stability and not merely exchange rate stability. What ever course is to be taken it should be clear from the economic events of the last decade that greater movement in the direction of a unified world monetary system will provide net global benefits over policies aimed at monetary independence.

consideration to my attention. See also Coats (1989) for this proposal.

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