

## **International Investing by Japanese Life Insurance Industry**

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### **Summary**

A decade has passed since Japanese life insurance industry accelerated overseas securities investment to a considerable extent, together with other institutional investors in Japan. During this period, the percentage of overseas securities against the total assets has grown at an extraordinary speed, reached 15% at the end of '89. Overseas investing brought both advantages and disadvantages. The goal of this article is the historical review of overseas investing by Japanese life insurance industry and other institutions, and to examine the significance of overseas investing for them.

### **Résumé**

#### **Placement International par l'Industrie d'Assurance sur la Vie Japonaise**

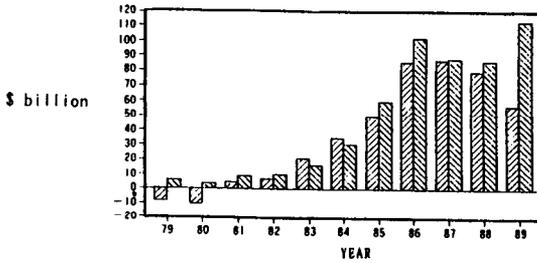
Il y a dix ans l'industrie d'assurance sur la vie japonaise ainsi que d'autres organismes de placement collectif ont accéléré de façon considérable l'investissement en valeurs à étrangères. Au cours de cette période, le pourcentage de valeurs étrangères par rapport à l'ensemble des actifs s'est accru à une vitesse extraordinaire et atteignait 15% à la fin de 1989. L'investissement à l'étranger présente des avantages et des inconvénients. Le but de cet article est de faire le tour d'horizon historique des investissements étrangers par l'industrie de l'assurance sur la vie japonaise et d'autres organismes et d'examiner l'importance pour eux de l'investissement à l'étranger.

## 1. BRIEF HISTORY OF INTERNATIONAL INVESTING BY LIFE INSURANCE INDUSTRY

- 1.1 Since the advent of the 1980s, the surplus in Japan's current balance has become stable and the corresponding deficiency in capital balance, in particular, overseas securities investing, has become enormously huge. This is mainly due to the growing foreign demand because of expanding U.S. economy and at the same time, to the liberalization and internationalization of Japan's financial systems. If you take a glance at the movements of Japan's current balances during the '80s, you can recognize that since they turned black in '81 at the beginning of the decade, they have been expanding straight until they marked 87 billion dollars in '86, and gradually calmed down partly because of Japan-U.S. trade friction since then. Equivalently, overseas securities investing has followed this trend and marked more than 100 billion dollars in '86, the highest level in history. (Fig. 1) Macroeconomics tells us that the surplus in the current balance recycles as a form of direct investment, securities investment, bank accounts or so. In case of Japan, securities investment, especially bond investment whose share has always been 60 to 80 % of the total investments, has been playing an important role throughout the 80's. (Table 1) By types of investors, life insurance companies, commercial banks, trust banks (mainly pension trust), and mutual funds are important whose participants whose share has been respectively 10 to 20 %. (Fig. 2)
- 1.2 In this manner, life insurance industry in Japan has been one of the main investors in the field of overseas securities investment in particular for foreign bond investment. Life insurance industry took up a positive attitude toward overseas securities investment in '77 when the interest rates domestic and overseas reversed. At the end of the '80 fiscal year, overseas securities investment by the life insurance industry was only 670 billion yen (2.5 % of the total assets), but at the end of '89 fiscal year

FIGURE 1. CURRENT BALANCE AND OVERSEAS SECURITIES INVESTMENT 79-89

(left : CURRENT BALANCE right : OVERSEAS SECURITIES INVESTMENT)



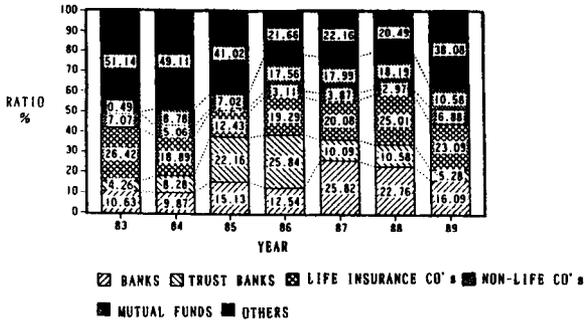
(SOURCE: BANK OF JAPAN)

TABLE 1. TYPES OF OVERSEAS SECURITIES INVESTMENT (\$ million)

YEAR	TOTAL	(%)	STOCK	(%)	BOND	(%)	SAMURAI BOND	(%)
80	3753	100	-213	-5.68	2996	79.83	970	25.85
81	8777	100	240	2.73	5810	66.20	2727	31.07
82	9743	100	151	1.55	6076	62.36	3516	36.09
83	16024	100	661	4.13	12505	78.04	2858	17.84
84	30795	100	51	0.17	26773	86.94	3971	12.89
85	59773	100	995	1.66	53479	89.47	5299	8.87
86	101977	100	7048	6.91	93024	91.22	1905	1.87
87	87757	100	16874	19.23	72885	83.05	-2002	-2.28
88	86949	100	2993	3.44	85812	98.69	-1865	-2.14
89	113178	100	17887	15.80	94083	83.13	1208	1.07

(SOURCE: BANK OF JAPAN)

FIGURE 2. OVERSEAS BOND INVESTMENT BY TYPES OF INVESTORS (NET INCREASE)



(SOURCE: REPORT OF THE SECURITIES BUSINESS OF JAPAN)

it reached 17.8 trillion yen (15.3 % of the total assets) and became one of the major classes in Japanese life insurance portfolios. (Fig. 3) During this decade life insurance industry suffered a huge valuation loss by the drastic fall of US dollars especially since the '85 Plaza agreement. It was a bitter and good lesson to the life insurance industry, who became more attentive to controlling exchange rate risks by means of a currency hedging, currency diversification et cetera.

1.3 The Japanese life insurance industry is domestic in nature. Why did they have to commit themselves to foreign investment? Several explanations to this questions were posed as follows.

(1) Arbitrage between interest rates domestic and overseas

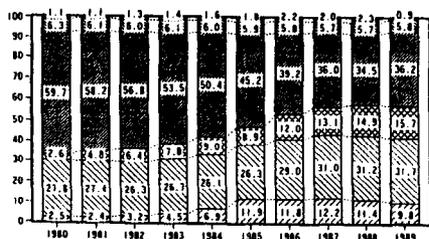
Outright investment of foreign bonds is accompanied by exchange rate risk. However, if one believes that the difference between the nominal interest rates domestic and overseas will overcome the expected future fall in the exchange rate of the currency invested in the long run, the return on the overseas assets will outperform the domestic one. [Note that if the P.P.P. (Purchasing Power Parity) theory holds, the highest-real-interest-rate currency will be the best for investing]. (Table 2)

(2) Diversification

(a) Countermeasures against great earthquake or other disasters

Some people say that it is reasonable to maintain a certain portion of the assets in overseas markets for the provision against the occurrence of a great earthquake. If a great earthquake should attack on the Metropolitan area of Tokyo, the value of life insurance assets will depreciate to a

FIGURE 3. PORTFOLIO OF LIFE INSURANCE INDUSTRY (ON BOOK BASIS)



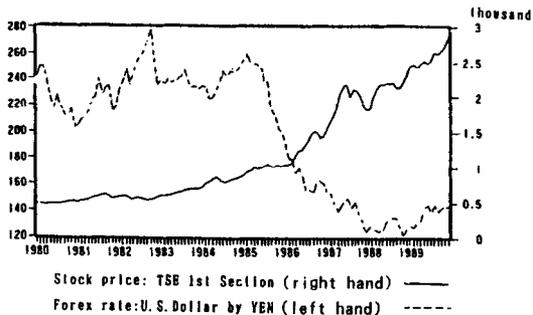
☐ CASH&DEPOSIT    ☐ DOMESTIC SECURITIES    ☐ FOREIGN SECURITIES  
 ☐ LOANS    ☐ PROPERTY    ☐ OTHERS

(SOURCE: LIFE INSURANCE ASSOCIATION OF JAPAN)

TABLE 2. INTEREST RATE DIFFERENCE BETWEEN DOMESTIC AND OVERSEAS AND THE BREAK EVEN FOREX RATE

INTEREST RATE DIFFERENCE		2.0%	2.5%	3.0%	3.5%	4.0%
10 YEARS LATER BREAK EVEN RATE	¥					
FOREX RATE AT INVESTMENT	¥ 150	123	117	112	106	101
	140	115	109	104	99	95
	130	107	102	97	92	88

FIGURE 4. ANTI-CORRELATIONS BETWEEN STOCK PRICE AND FOREX RATE



considerable extent through the crash in stock markets and the sudden drop in Yen.

(b) Anti-correlations between stock price and exchange rate

The large part of the risk which accompanies foreign bond investment is the unexpected change in foreign exchange rates. However, it seems that the movements of the US-Japan foreign exchange rate is anti-correlated with those of stock prices in the middle term perspective. (Fig. 4) Modern Portfolio Theory tells us that a pair of anti-correlated asset classes reduces the total portfolio risk. In terms of Macroeconomics, this anti-correlation can be explained by the following mechanism : Appreciation in Yen⇒Weakening inflation pressure⇒Anticipation for declining interest rate ⇒Rise in stock price. This subject will be re-examined later.

(3) Preference for income gains

Some people argue that Japanese life insurance companies are partial to income gains. Article 86 of the Insurance Act stipulates that capital gains are regarded as temporary profit, and in principle should be accumulated as a reserve of Article 86 from a viewpoint of financial soundness of the company. In Japan, life insurance companies adopt three source-of-earnings methods which is to refund the dividends based on the difference between the result and the assumed with regard to mortality rate, interest rate and expense rate respectively, and as a rule, capital gains cannot be used. In reality life insurance companies refund terminal special dividend whose source is realized capital gains which become usable as an exception under the approval of the Ministry of Finance. But a special dividend scale rather lacks flexibility, most insurance companies are inclined to earn more income gains to maintain or increase ordinary dividend with regard to

interest factor. While the interest rate is higher in the overseas countries than in Japan, foreign bond investment become more attractive than domestic investment.

## 2. FOREIGN BOND INVESTMENT PERFORMANCE DURING THE 80'S.

2.1 We will take a brief review of the foreign bond performance for the general Japanese investor. Take the seven major currencies which Japanese investors prefer, namely Japanese yen, US dollar, Canadian dollar, UK sterling, German mark, French franc and Australian dollar. We use Yen-denominated values of the Salomon Brothers' World Bond Index. Australian dollar data are not available prior to '83. (Table 3) At first, in the past 10 years (Jan.'80 to Dec.'89), the best performer on Yen terms was Japanese yen (8.17 %) followed by Canadian dollars (7.10 %), US dollars (6.39 %) et cetra. In the 5 years (Jan.'80 to Dec.'89), the best performer was French franc (9.93 %) followed by German mark (7.35 %), Japanese yen (6.66 %) and UK sterling (5.98 %). Conversely the worst performer in 10 years was German mark (2.52 %) and in 5 years was US dollar (2.13 %). The best performer was changing rapidly on a year-by-year basis. Putting every year's best performer in order from '80, we get : UK sterling, Japanese yen, Canadian dollar, Japanese yen, US dollar, French franc, UK sterling, German mark and Canadian dollar which shows that no currency was the best in two consecutive years. If one were to choose every year's best performer among seven currencies, he or she could get the surprisingly high compound annual return of 20.5 %! Conversely, in the worst case, -14.7 %. Figure 5 shows the accumulated returns for the best performer, Yen-bond investor, the worst performer. You can realize that the outright foreign bond investment is accompanied by gigantic risk.

2.2 Next we turn for risk measurement of foreign bond investment. Table 4 shows

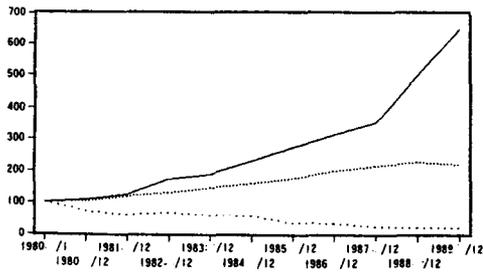
TABLE 3. RETURNS BY CURRENCIES (LOGARITHMIC) (%)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Jap. ¥	4.079	13.275	9.939	10.620	10.480	9.200	13.602	7.236	6.435	-3.165
U. S. \$	-17.314	10.364	36.210	2.782	21.178	2.553	-3.450	-27.752	10.166	29.122
U. K. £	8.839	-13.071	30.089	-0.159	-6.167	11.567	-8.311	12.551	5.202	8.895
DM	-27.887	-0.713	19.479	-9.260	6.794	13.578	10.133	-1.120	42.825	18.372
F. Fr.	-25.036	-9.525	8.500	-3.949	9.308	19.890	6.668	-3.642	5.931	20.784
Can. \$	-14.929	5.559	37.270	7.857	16.261	-6.371	-6.699	-18.059	20.486	29.613
World	-9.088	6.955	25.077	4.376	13.366	5.466	0.904	-11.891	8.006	19.066
Aus. \$	-	-	-	-	5.500	-35.899	-6.315	-1.177	28.814	18.656

	Past 10 YRS	Past 5 YRS
Jap. ¥	8.170	6.661
U. S. \$	6.386	2.128
U. K. £	4.943	5.981
DM	2.516	7.350
F. Fr.	2.893	9.926
Can. \$	7.099	3.794
World	6.224	4.310
Aus. \$	* -	0.81563

\* Australian dollar data are not available prior to '83.

FIGURE 5. BEST PERFORMER VERSUS WORST PERFORMER



— BEST PERFORMER ---YEN-BOND--- WORST PERFORMER

TABLE 4. RISK BY CURRENCIES (%)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Jap. ¥	3.115	1.484	1.312	1.312	0.942	0.937	2.635	3.221	1.610	1.306
U. S. \$	3.954	4.655	5.319	2.044	3.684	4.150	4.586	3.664	4.425	3.954
U. K. £	4.579	4.159	7.479	4.211	3.385	4.918	6.441	3.788	2.392	2.855
DM	5.868	5.137	2.975	1.900	3.447	3.207	3.560	2.150	2.163	2.604
Can. \$	4.053	5.102	6.610	1.601	4.497	4.609	4.341	4.421	4.407	3.980
F. Fr.	3.781	4.971	3.144	1.157	3.519	3.013	2.828	2.198	1.773	2.272
World	3.120	2.621	3.754	1.350	1.902	2.511	3.426	2.262	2.283	2.217
Aus. \$	—	—	—	—	—	5.682	9.059	6.162	2.735	5.504

	Past 10 YRS	Past 5 YRS
Jap. ¥	3.123	3.496
U. S. \$	6.683	6.766
U. K. £	7.201	6.671
DM	5.612	4.379
F. Fr.	4.928	3.908
Can. \$	7.227	7.049
World	4.217	4.123
Aus. \$	—	9.777

TABLE 5. CORRELATIONS BY CURRENCIES (10 YEARS, 5 YEARS)

		CORRELATIONS(10yrs)							
Jap. ¥	1								
U. S. \$	-0.005	1							
U. K. £	0.230	0.386	1						
DM	0.292	0.386	0.443	1					
Can. \$	0.015	0.834	0.410	0.130	1				
F. Fr.	0.187	0.413	0.388	0.374	0.452	1			
World	0.218	0.926	0.603	0.286	0.838	0.581	1		
	Jap. ¥	U. S. \$	U. K. £	DM	Can. \$	F. Fr.	World		

		CORRELATIONS(5yrs)							
Jap. ¥	1								
U. S. \$	-0.071	1							
U. K. £	0.333	0.223	1						
DM	0.288	0.308	0.436	1					
Can. \$	-0.118	0.887	0.303	0.278	1				
F. Fr.	0.232	0.491	0.460	0.847	0.454	1			
World	0.158	0.951	0.476	0.517	0.861	0.667	1		
Aus. \$	-0.210	0.377	0.239	0.081	0.429	0.153	0.392	1	
	Jap. ¥	U. S. \$	U. K. £	DM	Can. \$	F. Fr.	World		

the standard deviations of every month's returns of seven different currencies' bonds. In the past 10 years, the most risky currency was Canadian dollar (7.23 %) followed by UK sterling (7.20 %), US dollar (6.68 %) and so on. In the past 5 years, Australian dollar (9.78 %), Canadian dollar (7.05 %), US dollar (6.77 %), UK Sterling (6.67 %). Every year's standard deviations were relatively stable compared to the returns, and the most risky currencies in each successive year were : German mark, German mark, UK sterling, UK sterling, Canadian dollar, Australian dollar, Australian dollar, Australian dollar, US dollar and Australian dollar since '80.

2.3 Table 5 shows the correlations between the returns on Yen-denominated bonds and Foreign-currencies-denominated bonds for the past 10 and 5 years. Generally speaking, correlation coefficients were nearly zero for US dollar and Canadian dollar, along with relatively low positive (0.2 ~ 0.3) for UK sterling, German mark and French franc. However, every year's correlations were surprisingly unstable. For example, the correlations with U.S.bonds were distributed between -0.53 and +0.61. (Fig. 6)

2.4 Overall review : Concerning foreign bond performance during the 80's, Japanese Yen and North American currencies were high through the whole period, but in the latter half period, European currencies were high for Japanese investors. As for risks, North American currencies, Australian dollar and UK sterling were relatively high, whereas European currencies were relatively low constantly. The correlations with North American currencies were almost zero whereas European currencies were 0.2 to 0.3. But every year's correlations were very unstable. Figure 7 shows the relations between the returns and the risks at a glance.

FIGURE 6. CORRELATIONS BETWEEN U.S. \$ BOND AND YEN BOND 1980-89

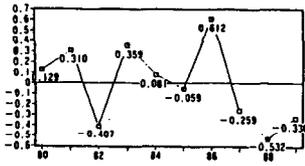


FIGURE 7. RISK-RETURN DIAGRAM OF FOREIGN BOND (Past 10 YRS)

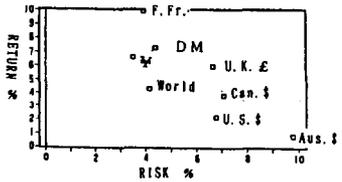
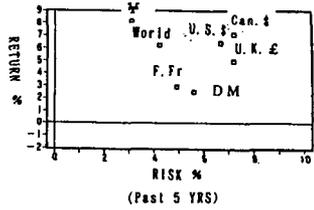


TABLE 6. FOREIGN BOND INVESTMENT BY MARKET (NET INCREASE) (%)

YEAR	TOTAL	U. S.	U. K.	GERMANY	LUXEMBURG	AUSTRALIA	CANADA	OTHERS
1983	100	46.98	7.77	1.71	18.93	5.30	14.85	4.47
1984	100	51.61	5.59	0.16	20.60	5.50	8.69	7.85
1985	100	67.50	4.92	-0.11	18.44	1.76	4.16	3.33
1986	100	56.90	6.50	0.70	24.05	0.34	7.38	4.14
1987	100	52.81	6.11	3.87	26.24	2.63	2.00	6.34
1988	100	57.00	7.97	3.13	20.79	2.17	2.69	6.26
1989	100	33.95	9.57	0.17	40.30	2.55	2.72	10.74

(SOURCE: REPORT OF THE SECURITIES BUSINESS OF JAPAN)

TABLE 7. FOREIGN BOND INVESTMENT OF JAPANESE LIFE INSURANCE INDUSTRY BY CURRECIES (NET INCREASE) (%)

YEAR	TOTAL	U. S. \$	Can. \$	U. K. £	U. K. £	DM	F. Fr.	S. Fr.	D. G.	Jap. ¥	OTHERS
80	100	30.13	38.51	1.70	11.62	3.31	1.12	0.00	2.70	0.20	10.70
81	100	35.41	29.63	3.65	9.71	6.24	0.38	0.01	2.66	12.19	0.12
82	100	30.57	24.88	14.44	8.70	3.39	0.91	0.00	0.60	14.91	1.58
83	100	32.07	24.09	16.59	9.52	1.69	0.60	0.00	0.45	12.70	2.29
83	100	32.07	24.09	16.59	9.52	1.69	0.60	0.00	0.45	12.70	2.29
84	100	34.20	29.27	19.07	4.63	0.59	0.50	0.00	0.47	9.58	1.69
85	100	48.69	28.32	11.04	3.46	0.20	0.43	0.00	0.74	5.48	1.64
86	100	49.55	24.36	4.66	3.68	1.57	1.29	0.00	0.20	9.44	5.25
87	100	41.52	19.80	8.16	8.57	4.11	1.31	0.00	0.76	6.63	9.15
88	100	41.62	19.81	8.80	9.21	4.47	1.78	0.00	0.66	7.63	6.02
89	100	42.12	19.20	8.25	7.22	3.95	3.88	0.00	0.84	8.61	5.92

(SOURCE: LIFE INSURANCE ASSOCIATION OF JAPAN)

### 3. INSTITUTIONAL INVESTORS' FOREIGN BOND PERFORMANCE

3.1 I have already mentioned that the overseas securities investment played an important role to recycle the huge surplus in Japan's current account. Here I will try to examine Japanese institutional investors' foreign bond performance during the 80's. According to Table 6 which shows the foreign bond investment by market, 60 to 70 % of the foreign bond investment was US dollar-denominated if all the investment to Luxembourg are regarded as Euro-dollar bond. On the other hand, life insurance industry's foreign bond investment was allocated toward roughly 30 to 50 % for US dollar, 20 to 40% for Canadian dollar and 10 % each for Australian dollar and UK Sterling. (Table 7)

3.2 Our goal is to compare Japan's whole foreign bond investment performance with that of Japanese life insurance industry. In order to do this, we apply every month's bond performance in each currency to the amount of foreign bond investment by each and get currency-weighted performance. Then compute the accumulated total returns and compare them with Yen-dominated bond. (Fig. 8) Observation proves that Japanese life insurance industry exceeded Japan's total in performance since '83. This is mainly due to the underweight in US dollar in life insurance industry's portfolio, which performed low for these 5 years.

3.3 On the other hand, we compare returns versus risks between Japan's total investors and life insurance industry on Yen-denominated bond for these 10 years. (Fig. 9) Life insurance industry is higher in return and lower in risk than Japan's total investors, but lower in return and higher in risk than Yen-denominated bond. From this observation, foreign bond investment can be appreciated to the extent that it contributes to the reduction in total risk of the overall portfolio.

FIGURE 8. ACCUMULATED RETURNS OF TOTAL INVESTORS. LIFE INSURANCE AND YEN BOND

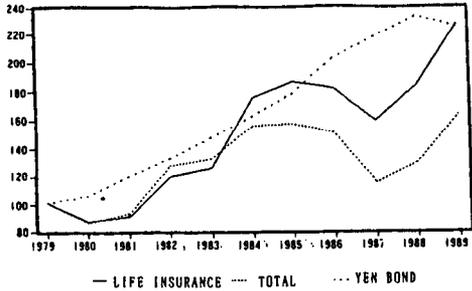


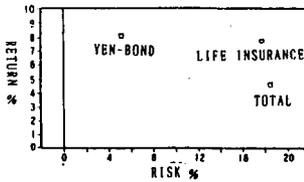
TABLE 8. EXPOSURES OF U.S.-JAPAN SECURITIES MARKETS TO U.S.-JAPAN FOREX RATE

ASSET	YEAR	$\alpha$ (t-value)	$\beta$ (t-value)
JAPANESE STOCK	70~89	0.01214(4.35)	-0.20704(-2.00) *
	70~79	0.00942(2.26) *	-0.17901(-0.97) **
	80~89	0.01490(4.00)	-0.21908(-1.81) **
JAPANESE BOND	70~89	0.00618(7.56)	-0.16555(-5.45)
	70~79	0.00622(5.37)	-0.15285( 0.98) **
	80~89	0.00616(5.29)	-0.17236(-4.54)
U. S. STOCK (Yen terms)	70~89	0.00859(2.83)	0.87343( 7.77)
	70~79	0.00412(0.98) **	0.81102( 4.34)
	80~89	0.01301(2.99)	0.91157( 6.44)
U. S. BOND (Yen terms)	70~89	0.00715(3.34)	0.96086( 12.1)
	70~79	0.00409(1.88) **	0.96866( 10.0)
	80~89	0.01024(2.77)	0.96000( 7.98)

(NOTE) \* denotes a coefficient which is not significantly different from zero at the 5% confidence level.

\*\* denotes a coefficient which is not significantly different from zero at the 1% confidence level.

FIGURE 9. RISK AND RETURN OF TOTAL INVESTORS. LIFE INSURANCE AND YEN BOND



(NOTE) Risks are computed on a basis of annual compound returns.

#### 4. SOME EMPIRICAL TEST FOR PORTFOLIO RISK REDUCTION EFFECT

4.1 This section deals with the empirical test for portfolio risk reduction effect caused by the anti-correlations between foreign bond and Yen-denominated bond. To do this, we use the method of Adler and Simon.<sup>(1)</sup> Firstly, we assume that some parts of the variations in each country's securities are affected by the movements in the inter-currency foreign exchange rates, and compute their sensitivities ( $\beta$ 's) to exchange rates. Secondly, we assume the following N-variables multiple regression model:

$$\ln (P_{t+1}^i / P_t^i) = \alpha + \sum \beta_i \cdot \ln (F_{t+1}^i / F_t^i) + \varepsilon_{t+1}^i$$

where  $F_t^i$  : currency i's foreign exchange rate against Yen

$P_t^i$  : price of the currency i's security on a Yen basis

$$P_t^i = F_t^i \cdot P_t^{*i} \quad (P_t^{*i} \text{ is its price but on a local basis})$$

$\varepsilon_{t+1}^i$  : remainder term with such condition that

$$E(\varepsilon) = \text{cov}(\varepsilon, F) = 0$$

Under the above model, each  $\beta$  shows the sensitivity factor of the security to the currency i's exchange rate.

4.2 To make the story simple, we limit the number of currencies and securities only two, namely Yen and U.S.Dollar, stock and bond market. The data used are 20 year's monthly returns of common stock and government bond from Jan. '70 to Dec.'89. The results are shown in Table 8. As we have expected,  $\beta$  coefficients of Japanese stock and bond are negative, while those of U.S. stock and bond positive. However, t-values regarded as the explanation power may change depending on the choice of assets, currencies and periods of time. For example, the t-values for Japanese stock and bond are low in

particular for the period of the 70's.

4.3 To immunize the foreign exchange rate risk of the overall portfolio, it is enough to find the asset mix whose weighted-average  $\beta$  is zero. Based on the past 20 years' result, such pairs can be found as below.

Japanese stock : U.S. stock = 80.84 : 19.16

Japanese stock : U.S. bond = 82.27 : 17.73

Japanese bond : U.S. stock = 84.07 : 15.93

Japanese bond : U.S. bond = 85.30 : 14.70

Then, if an investor held 80% of Japanese stock and 20% of U.S. bond, he or she could have immunized the foreign exchange rate risk. Actually, Japanese life insurance industry held a similar portfolio in these 10 years, which implied the possibility for Japanese life insurance industry to have succeeded in hedging against currency risk to some extent.

#### ACKNOWLEDGEMENT

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