Table 3
Bivariate Johansen Tests between alternative Currencies

| Relationship | Lag | $H_0$: r=0 | | $H_0$: r=1 |
|---|---|---|---|---|
| | | Trace | Maximal Eigenvalue | Maximal Eigenvalue & Trace |
| 1980:1-1994:12 Period | | | | |
| Pound-USD | 11 | 18.539 | 14.104 | 4.436 |
| Pound-SGD | 8 | 7.491 | 7.081 | 0.410 |
| SGD-Yen | 11 | 8.644 | 8.557 | 0.086 |
| SGD-USD | 11 | 13.647 | 13.641 | 0.006 |
| USD-Yen | 11 | 7.304 | 6.278 | 1.026 |
| Yen-Pound | 11 | 12.245 | 11.065 | 1.181 |
| 1980:1-1985:10 Period | | | | |
| Pound-USD | 11 | 13.3 | 10.861 | 2.439 |
| Pound-SGD | 8 | 6.3 | 4.766 | 1.534 |
| SGD-Yen | 11 | 17.639 | 16.929** | 0.71 |
| SGD-USD | 11 | 19.907 | 18.884* | 1.023 |
| USD-Yen | 11 | 19.597 | 14.684 | 4.911 |
| Yen-Pound | 11 | 7.221 | 5.428 | 1.794 |
| 1985:10-1994:12 Period | | | | |
| Pound-USD | 11 | 11.440 | 9.354 | 0.209 |
| Pound-SGD | 8 | 3.855 | 3.853 | 0.002 |
| SGD-Yen | 11 | 6.249 | 5.315 | 0.934 |
| SGD-USD | 11 | 11.394 | 11.391 | 0.003 |
| USD-Yen | 11 | 3.549 | 3.431 | 0.071 |
| Yen-Pound | 11 | 2.421 | 2.222 | 0.199 |

* and ** Significant at the 1% and 2.5% levels, respectively.

Table 4
Residual Misspecification Tests in the VAR Model

| Equation | FPE | Q(20) | SK | KR | JB(2) | Sigma |
|---|---|---|---|---|---|---|
| 1980:1-1994:12 Period | | | | | | |
| Yen | 0.0023 | 29.84 | 0.664* | 1.639* | 30.20* | 0.044 |
| SGD | 0.0003 | 20.15 | 0.293* | 4.628* | 146.78* | 0.015 |
| USD | 0.0134 | 19.11 | -0.565* | 3.179* | 76.72* | 0.107 |
| Pound | 0.0011 | 29.63 | 0.229 | 4.279* | 124.73* | 0.031 |
| 1980:1-1985:10 Period | | | | | | |
| Yen | 0.0006 | 12.28 | 0.472 | -0.156 | 2.421 | 0.021 |
| SGD | 0.0001 | 15.28 | 0.213 | -0.276 | 0.783 | 0.007 |
| USD | 0.0101 | 21.93 | 0.441 | 0.978 | 3.784 | 0.082 |
| Pound | 0.0015 | 15.41 | -0.026 | 0.919 | 1.532 | 0.031 |
| 1985:10-1994:12 Period | | | | | | |
| Yen | 0.01254 | 4.29 | 9.01* | 104.0* | **** | 0.1029 |
| SGD | 0.01025 | 1.57 | 11.39* | 143.7* | **** | 0.0930 |
| USD | 0.10381 | 2.74 | 10.17* | 124.6* | **** | 0.2961 |
| Pound | 0.04673 | 1.45 | 11.54* | 146.2* | **** | 0.1987 |

Sigma refers to the standard error of the equation.
Q(20) refer to Ljung-Box Q statistic for serial correlation for the first 20 autocorrelations.
JB= Jarque-Bera test for normality of residuals.
FPE refers to Akaike information criterion.
SK refers to skewness.
KR refers to kurtosis.
* Statistically significant at the 5% or better.
**** Statistically significant at the 1%.

Table 5
Johansen-Juselius maximum likelihood cointegration tests

| r | n-r | Trace | Maximal eigenvalue | Eigenvalue |
|---|---|---|---|---|
| 1980:1-1994:12 Period | | | | |
| 0 | 4 | 37.724 | 17.639 | 0.0964 |
| 1 | 3 | 20.085 | 13.34 | 0.0738 |
| 2 | 2 | 6.745 | 6.015 | 0.03398 |
| 3 | 1 | 0.729 | 0.729 | 0.00418 |
| 1980:1-1985:10 Period | | | | |
| 0 | 4 | 68.496* | 41.283* | 0.47537 |
| 1 | 3 | 27.213 | 16.758 | 0.23037 |
| 2 | 2 | 10.455 | 9.592 | 0.13919 |
| 3 | 1 | 0.863 | 0.863 | 0.01340 |
| 1985:10-1994:12 Period | | | | |
| 0 | 4 | 44.693 | 26.819 | 0.14284 |
| 1 | 3 | 17.874 | 11.549 | 0.06422 |
| 2 | 2 | 6.325 | 6.260 | 0.03534 |
| 3 | 1 | 0.065 | 0.065 | 0.00037 |

* significant at the 1% levels.
r and n-r denote the number of eigenvectors and common trends, respectively.

Table 6
Testing for zero loading factors

| $\alpha$-Restriction | Eigenvalues | | | | $-2\ln Q(H_4 \backslash H_2)$ |
|---|---|---|---|---|---|
| 1980:1-1985:10 Period | | | | | |
| $H_2$: $\pi_q=\alpha\beta'$ | (0.47537 | 0.23037 | 0.13919 | 0.134) | |
| $H_4$: $\alpha_J=0$ | (0.26158 | 0.11826 | 0.03648 | 0.000) | $\chi^2(1)=23.24$* |
| $H_4$: $\alpha_S=0$ | (0.20359 | 0.05317 | 0.00679 | 0.000) | $\chi^2(1)=28.38$* |
| $H_4$: $\alpha_{Uk}=0$ | (0.35410 | 0.15710 | 0.00077 | 0.000) | $\chi^2(1)=14.14$* |
| $H_4$: $\alpha_{US}=0$ | (0.16944 | 0.04998 | 0.00874 | 0.000) | $\chi^2(1)=31.24$* |

* indicates significant at the 5%.

Table 7
Iterated Johansen-Juselius Test for the Four Exchange Rates System

| Sample | $H_0$: r=0 (n=4) | | $H_0$: r=1 (n=3) | |
|---|---|---|---|---|
| | Maximal eigenvalue | Trace | Maximal eigenvalue | trace |
| 1980:1-1985:10 | 41.283* | 68.496* | 16.758 | 27.213 |
| 1980:1-1986:10 | 17.737 | 38.109 | 13.351 | 20.372 |
| 1980:1-1987:10 | 22.108 | 41.76 | 11.501 | 19.742 |
| 1980:1-1988:10 | 19.977 | 35.992 | 8.391 | 16.015 |
| 1980:1-1989:10 | 21.71 | 38.45 | 9.72 | 16.741 |
| 1980:1-1990:10 | 20.611 | 40.745 | 12.627 | 20.134 |
| 1980:1-1991:10 | 20.144 | 38.17 | 11.738 | 18.027 |
| 1980:1-1992:10 | 15.502 | 30.982 | 10.869 | 15.481 |
| 1980:1-1993:10 | 20.139 | 40.227 | 13.418 | 20.088 |
| 1980:1-1994:12 | 17.639 | 37.724 | 13.34 | 20.085 |
| 1980:1-1996:1 | 15.636 | 35.772 | 13.351 | 20.136 |

* Significant at the 1% level. The significance levels for r=0 and r=1 at the 1% are 32.616 and 26.154 for maximal eigenvalue, respectively. The significance levels for r=0 and r=1 at the 1% for the trace are 55.551 and 37.291, respectively.