TABLE 1

Properties of exchange rates and consumer price indices*

| Statistic | Country Relative to U.S. | | | | | | | | | | | Europe Relative to U.S. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Austria | Denmark | Finland | France | Germany | Italy | Netherlands | Norway | Spain | Switzerland | U.K. | |
| *Standard Deviations* | | | | | | | | | | | | |
| Price ratio | 1.59 | 1.23 | 1.80 | 1.17 | 1.42 | 1.67 | 1.62 | 1.80 | 2.29 | 1.49 | 1.74 | 1.18 |
| Exchange rate | | | | | | | | | | | | |
| Nominal | 8.19 | 8.08 | 8.28 | 8.52 | 8.37 | 8.51 | 8.30 | 6.23 | 8.88 | 9.08 | 8.20 | 7.95 |
| Real | 7.93 | 8.00 | 7.71 | 7.95 | 8.06 | 7.80 | 7.99 | 6.08 | 8.42 | 8.83 | 7.89 | 7.52 |
| *Autocorrelations* | | | | | | | | | | | | |
| Price ratio | .89 | .74 | .92 | .92 | .90 | .87 | .93 | .90 | .90 | .90 | .79 | .90 |
| Exchange rate | | | | | | | | | | | | |
| Nominal | .83 | .84 | .85 | .86 | .83 | .85 | .84 | .78 | .87 | .82 | .84 | .85 |
| Real | .82 | .83 | .83 | .84 | .82 | .83 | .82 | .77 | .86 | .82 | .81 | .83 |
| *Cross-Correlations* | | | | | | | | | | | | |
| Real and nominal exchange rates | .98 | .99 | .98 | .99 | .99 | .98 | .98 | .96 | .97 | .99 | .98 | .99 |

* See notes at the end of the tables.

TABLE 2

Properties of exchange rates and disaggregated consumer price indices*

| Statistic | Country Relative to U.S. | | | | Europe Relative to U.S. |
|---|---|---|---|---|---|
| | France | Italy | Netherlands | Norway | |
| *Standard Deviations* | | | | | |
| Price ratio | | | | | |
| All goods | 1.01 | 1.57 | 1.44 | 1.82 | 1.24 |
| Traded goods | 1.42 | 2.00 | 1.97 | 2.13 | 1.65 |
| Exchange rate | | | | | |
| Nominal | 8.72 | 8.68 | 8.50 | 6.39 | 8.25 |
| All goods real | 8.25 | 8.10 | 8.24 | 6.14 | 7.78 |
| Traded goods real | 8.05 | 8.12 | 8.05 | 6.34 | 7.76 |
| *Autocorrelations* | | | | | |
| Price ratio | | | | | |
| All goods | .90 | .83 | .88 | .91 | .91 |
| Traded goods | .90 | .85 | .84 | .90 | .89 |
| Exchange rate | | | | | |
| Nominal | .86 | .86 | .84 | .79 | .85 |
| All goods real | .84 | .83 | .83 | .76 | .83 |
| Traded goods real | .84 | .83 | .82 | .79 | .83 |
| *Cross-Correlations of Exchange Rates* | | | | | |
| Real and nominal | | | | | |
| All goods | .99 | .98 | .99 | .96 | .99 |
| Traded goods | .99 | .97 | .97 | .94 | .94 |
| All and traded goods real | 1.00 | .99 | .99 | .99 | 1.00 |

* See notes at the end of the tables.

Table 3

Properties of exchange rates and wholesale price indices*

| Statistic | Country Relative to U.S. | | | | | | | | | Europe Relative to U.S. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Austria | Denmark | Finland | Germany | Italy | Netherlands | Spain | Switzerland | U.K. | |
| *Standard Deviations* | | | | | | | | | | |
| Price ratio | 2.19 | 2.25 | 1.92 | 2.04 | 2.86 | 2.59 | 2.85 | 1.99 | 2.52 | 2.08 |
| Exchange rate | | | | | | | | | | |
| Nominal | 8.19 | 8.08 | 8.28 | 8.37 | 8.51 | 8.30 | 8.88 | 9.08 | 8.20 | 7.98 |
| Real | 7.45 | 6.52 | 7.29 | 7.74 | 7.35 | 7.59 | 7.79 | 8.71 | 7.25 | 7.30 |
| *Autocorrelations* | | | | | | | | | | |
| Price ratio | .76 | .86 | .83 | .88 | .83 | .90 | .87 | .85 | .85 | .87 |
| Exchange rate | | | | | | | | | | |
| Nominal | .83 | .84 | .85 | .83 | .85 | .84 | .87 | .82 | .84 | .85 |
| Real | .79 | .80 | .82 | .81 | .82 | .82 | .84 | .80 | .79 | .82 |
| *Cross-Correlations* | | | | | | | | | | |
| Real and nominal exchange rates | .97 | .97 | .98 | .97 | .95 | .95 | .95 | .98 | .95 | .97 |

* See notes at the end of the tables.

Table 4

Parameter values*

| | |
|---|---|
| *Benchmark Model* | |
| Preferences | $\beta = .99$, $\psi = 10$, $\gamma = 5$, $\sigma = 5$, $\eta = .39$, $\omega = .94$ |
| Final goods technology | $\rho = 1/3$, $a_1 = .94$, $a_2 = .06$ |
| Intermediate goods technology | $\alpha = 1/3$, $\delta = .021$, $\theta = .9$, $N = 4$ |
| Money growth process | $\rho_\mu = .68$, $\text{corr}(\varepsilon_\mu, \varepsilon_\mu^*) = .5$ |
| *Variations*[a] | |
| High exports | $a_1 = .76$, $a_2 = .24$ |
| Nonseparable preferences | $\xi = 2.25$ |
| Real shocks | |
| Technology | $\rho_A = .95$, $\text{var}(\varepsilon_A) = \text{var}(\varepsilon_A^*) = (.007)^2$, $\text{corr}(\varepsilon_A, \varepsilon_A^*) = .25$ |
| Government consumption | $\mu_g = .13$, $\rho_g = .97$, $\text{var}(\varepsilon_g) = \text{var}(\varepsilon_g^*) = (.01)^2$ |
| Taylor rule | $\rho_r = .79$, $\alpha_\pi = 2.15$, $\alpha_y = .93/4$, $\text{corr}(\varepsilon_r, \varepsilon_r^*) = .5$ |
| Sticky wages | $\vartheta = .87$, $M = 4$ |
| Incomplete markets | Same as benchmark model |

* See notes at the end of the tables.

Table 5

Exchange rates and prices for the models*

| | | | Variations on the Benchmark Economy[a] | | | | | |
|---|---|---|---|---|---|---|---|---|
| Statistic | Data[b] | Benchmark Economy | High Exports | Nonseparable Preferences | Real Shocks | Taylor Rule | Sticky Wages | Incomplete Markets |
| *Standard Deviations Relative to GDP*[c] | | | | | | | | |
| Price ratio | .71 | 3.00 (.75) | 3.26 (.77) | .02 (.00) | 2.98 (.74) | 1.35 (.33) | 2.11 (.59) | 2.98 (.75) |
| Exchange rate | | | | | | | | |
| Nominal | 4.67 | 4.32 (.80) | 4.27 (.79) | .07 (.01) | 4.27 (.80) | 4.66 (.66) | 4.14 (.80) | 4.22 (.78) |
| Real | 4.36 | 4.27 (.72) | 4.09 (.67) | .05 (.01) | 4.26 (.71) | 4.98 (.72) | 4.35 (.83) | 4.19 (.71) |
| *Autocorrelations* | | | | | | | | |
| Price ratio | .87 | .93 (.02) | .92 (.02) | .81 (.06) | .93 (.02) | .92 (.02) | .95 (.02) | .93 (.02) |
| Exchange rate | | | | | | | | |
| Nominal | .86 | .69 (.08) | .69 (.08) | .83 (.05) | .69 (.08) | .46 (.10) | .69 (.08) | .69 (.08) |
| Real | .83 | .62 (.08) | .58 (.08) | .77 (.06) | .62 (.08) | .48 (.09) | .69 (.08) | .62 (.08) |
| *Cross-Correlations* | | | | | | | | |
| Real and nominal exchange rates | .99 | .76 (.06) | .70 (.07) | .98 (.00) | .76 (.06) | .96 (.01) | .88 (.04) | .75 (.06) |

* See notes at the end of the tables.

TABLE 6

Business cycle statistics for the models*

| Statistic | Data[a] | Benchmark Economy | High Exports | Nonseparable Preferences | Real Shocks | Taylor Rule | Sticky Wages | Incomplete Markets |
|---|---|---|---|---|---|---|---|---|
| | | | *Variations on the Benchmark Economy* | | | | | |
| *Standard Deviations Relative to GDP* | | | | | | | | |
| Consumption | .83 | .83 | .83 | .92 | .83 | .83 | .83 | .83 |
| | | (.01) | (.04) | (.00) | (.02) | (.01) | (.02) | (.01) |
| Investment | 2.78 | 1.59 | 1.70 | 1.32 | 2.34 | 1.62 | 1.49 | 1.59 |
| | | (.01) | (.08) | (.01) | (.05) | (.01) | (.03) | (.01) |
| Employment | .67 | 1.51 | 1.49 | 1.51 | 1.56 | 1.51 | 1.50 | 1.50 |
| | | (.01) | (.03) | (.00) | (.09) | (.00) | (.01) | (.01) |
| Net exports | .11 | .09 | .69 | .04 | .11 | .09 | .19 | .09 |
| | | (.01) | (.08) | (.00) | (.02) | (.01) | (.03) | (.01) |
| *Autocorrelations* | | | | | | | | |
| GDP | .88 | .62 | .65 | .03 | .61 | .49 | .70 | .62 |
| | | (.08) | (.07) | (.10) | (.08) | (.09) | (.07) | (.08) |
| Consumption | .89 | .61 | .60 | .03 | .61 | .48 | .67 | .61 |
| | | (.08) | (.08) | (.10) | (.08) | (.09) | (.07) | (.08) |
| Investment | .91 | .60 | .59 | .03 | .60 | .47 | .68 | .60 |
| | | (.08) | (.08) | (.10) | (.08) | (.09) | (.07) | (.08) |
| Employment | .90 | .61 | .63 | .03 | .61 | .48 | .69 | .61 |
| | | (.08) | (.07) | (.10) | (.08) | (.09) | (.07) | (.08) |
| Net exports | .82 | .72 | .53 | .12 | .77 | .68 | .84 | .71 |
| | | (.05) | (.07) | (.11) | (.05) | (.06) | (.04) | (.05) |
| *Cross-Correlations* | | | | | | | | |
| Between foreign and domestic | | | | | | | | |
| GDP | .60 | .49 | .58 | .50 | .47 | .51 | .43 | .49 |
| | | (.14) | (.14) | (.09) | (.14) | (.12) | (.18) | (.14) |
| Consumption | .38 | .49 | .52 | .50 | .48 | .50 | .49 | .49 |
| | | (.14) | (.13) | (.09) | (.14) | (.12) | (.16) | (.14) |
| Investment | .33 | .49 | .52 | .41 | .48 | .50 | .48 | .49 |
| | | (.14) | (.13) | (.10) | (.14) | (.12) | (.16) | (.14) |
| Employment | .39 | .49 | .60 | .50 | .48 | .51 | .44 | .49 |
| | | (.14) | (.13) | (.09) | (.14) | (.12) | (.18) | (.14) |
| Between net exports and GDP | −.41 | .04 | .11 | −.50 | .05 | −.04 | .26 | .04 |
| | | (.16) | (.15) | (.09) | (.17) | (.15) | (.18) | (.16) |
| Between real exchange rates and | | | | | | | | |
| GDP | .08 | .51 | .34 | .17 | .51 | .49 | .52 | .51 |
| | | (.13) | (.15) | (.09) | (.13) | (.11) | (.15) | (.13) |
| Net exports | .14 | −.04 | −.47 | −.26 | .03 | −.20 | .30 | −.04 |
| | | (.13) | (.09) | (.06) | (.16) | (.13) | (.13) | (.13) |
| Relative consumption | −.35 | 1.00 | 1.00 | .32 | 1.00 | 1.00 | 1.00 | 1.00 |
| | | (.00) | (.00) | (.04) | (.00) | (.00) | (.00) | (.00) |

* See notes at the end of the tables.

TABLE 7

The correlation between real exchange rates and relative consumption among five countries during 1973:1–1994:4*

| | France | Germany | Italy | U.K. |
|---|---|---|---|---|
| U.S. | −.06 | −.15 | −.35 | −.48 |
| France | | .24 | −.17 | .05 |
| Germany | | | −.08 | .17 |
| Italy | | | | .14 |

* See notes at the end of the tables.

## Footnotes to the Tables

Table 1.

* The statistics are based on logged and H-P–filtered quarterly data for the period 1973:1–2000:1. The statistics for Europe are trade-weighted aggregates of countries in the table. (See the text for details on construction of the data for Europe.)

Table 2.

* The statistics are based on logged and H-P–filtered quarterly data for the period 1973:1–1998:4. The statistics for Europe are trade-weighted aggregates of countries in the table. (See the text for details.)

Table 3.

* The statistics are based on logged and H-P–filtered quarterly data for the period 1973:1–2000:1. The statistics for Europe are trade-weighted aggregates of countries in the table. (See the text for details.)

Table 4.

[a] Other parameters in the variations are the same as in the benchmark model, except for two parameters. The adjustment cost parameter is chosen to keep the relative volatility of consumption and output the same as in the data. The innovations to the monetary policy are chosen to keep the volatility of output the same as in the data.

Table 5.

* The statistics are based on logged and H-P–filtered data. For each economy the standard deviation of monetary shocks are chosen so that the standard deviation of GDP is the same as it is in the data for 1973:1–1994:4, 1.82%. Numbers in parentheses are standard deviations of the statistic across 100 simulations.

[a] See Table 4 for specifications of the variations of the benchmark economy.

[b] The statistics are based on a European aggregate with France, Italy, the U.K., and Germany over the sample period 1973:1–1994:4.

[c] The standard deviations of the variables are divided by the standard deviation of GDP.

Table 6.

* Notes *a* and *c* of Table 5 also apply here. With the exception of net exports, the standard deviation of each variable is divided by the standard deviation of output. Throughout the table, we measure net exports as the H-P–filtered ratio of real net exports to real gross domestic product. Thus, the standard deviation of net exports is simply the standard deviation of this ratio.

[a] With the exception of net exports, the standard deviations and autocorrelations in the data column are based on logged and H-P–filtered U.S. quarterly data for the period 1973:1–1994:4. The cross-correlations between domestic and foreign variables are based on the U.S. and a European aggregate of France, Italy, the U.K., and Germany.

Table 7.

* The table reports the correlation between bilateral real exchange rates $\hat{q}_t$ and relative consumption $\hat{c}_t - \hat{c}_t^*$.