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The Mark III International Transmission Model: Estimates

Michael R. Darby and Alan C. Stockman

The simultaneous estimation of the Mark III International Transmission Model produced some surprising results. The major implications of the model estimates are: (1) Countries linked by pegged exchange rates appear to have much more national independence than generally supposed. (2) Substantial or complete sterilization of the contemporaneous effects of the balance of payments on nominal money appears to be a universal practice of nonreserve central banks. (3) Quantities such as international trade flows are not well explained by observed prices, exchange rates, and interest rates. (4) Explaining real income by innovations in aggregate demand variables works well for U.S. real income but does not transfer easily to other countries.

Our estimation method is explained in section 6.1 before the results are reported and interpreted in section 6.2. A detailed summary concludes the chapter.

6.1 Estimation Methods

If a simultaneously determined model such as ours is estimated by ordinary least squares (OLS), simultaneous equation bias occurs. This arises because the endogenous variables respond to each other so that the random disturbance in any one behavioral equation may be reflected in movements of all the other endogenous variables. As a result, when some endogenous variables are used to explain the behavior of another endogenous variable, their values are potentially correlated with the random disturbance in the equation. Their OLS coefficients will reflect not only their effect on the variable being explained but also the effect of its residual on them. Simultaneous equation methods are used to remove this spurious correlation that is due to reverse causality.

The most popular simultaneous equation methods are two-stage and three-stage least squares (2SLS and 3SLS, respectively.)[1] Unfortunately, neither exists for our model. This is because the first stage of each approach involves obtaining fitted values of each of the endogenous variables which are uncorrelated with the other endogenous variables. This is done by fitting OLS regressions for each endogenous variable as a function of all the predetermined variables (exogenous and lagged endogenous). In large samples, these fitted values are uncorrelated with the residuals in the behavioral equations and, when substituted for the actual values in OLS estimates of the behavioral equations, give unbiased estimates of the coefficients. Unfortunately, when the number of predetermined variables equals or exceeds the number of observations, the first-stage regressions can perfectly reproduce the actual values of the endogenous variables and no simultaneous equation bias is removed.

We reduce the number of predetermined variables relative to the number of observations in two ways: (1) For each country we use as predetermined variables only domestic variables for that country plus fitted values of only those foreign variables which enter that country's submodel. The fitted foreign variables are obtained by fitting interest rates, income, and prices on each foreign country's own domestic variables and then forming indexes (where necessary as indicated by identities (R18), (R19), (N18), and (N19)) of these fitted foreign variables. (2) Using this reduced set of predetermined variables,[2] we take sufficient principal components to explain over 99.95% of their variance. (Variables were initially standardized so that the principal components are not affected by their scale.) Usually this involves thirty to thirty-five components (indicating thirty to thirty-five independent sources of variation in the instrument list). However, in estimating certain equations for short subperiods[3] it is necessary to limit the number of principal components to half the number of observations in the subperiod. In either case these principal components are used as our matrix for obtaining fitted values of the endogenous variables in the first stage of our 2SLS regressions.

In summary, the model is estimated by the principal-components 2SLS method where (*a*) the basic instrument list for each country consists of domestic predetermined variables plus fitted values of those foreign variables which appear in the model based on foreign predetermined variables, and (*b*) this basic instrument list is spanned by a number of components either equal to half the observations being used or sufficient to explain over 99.95% of the variance in the basic instrument list, whichever is smaller.

[1] Other, more complicated methods exist but could not be entertained for such a large model as ours because of software and computing budget limitations.

[2] The actual lists of predetermined variables for each country are presented in table 6.1.

[3] That is, for the floating period for all nonreserve countries except Canada and the pegged period for Canada.

6.2 Estimation Results

The estimated model is reported in tables 6.2 through 6.16. We first discuss the estimates equation by equation in this section and then check the cross-correlations of the residuals for evidence of omitted channels of transmission. We draw our general conclusions in section 6.3. The period of estimation is 1957I–76IV except, as indicated, where the model differs during pegged and flexible rate periods. Details on the data used are contained in the appendix to this chapter.

6.2.1 Real-Income Equations (R1) and (N1)—Table 6.2

For the United States, there appear to be substantial effects from money shocks and weak or nonexistent effects from both real-government spending and export shocks. For the nonreserve countries, a few apparently significant monetary shocks enter, but we generally cannot reject the hypothesis that all the money shock coefficients are zero. This is shown in table 6.3, where only Canada and Italy among the nonreserve countries reach even the 10% level of significance. The apparent impotence of monetary policy in the nonreserve countries may be real, or it may reflect either a greater measurement error in defining the money shocks or a stable monetary policy, which would also reduce the signal-to-noise ratio in the $\hat{M}_j$ data.[4]

The other demand shock variables, with occasional exceptions, also seem to have little systematic effect on the nonreserve countries' real incomes. The sensitivity of these results to alternative definitions of demand shocks and to effects of anticipated variables is examined in chapter 9.

6.2.2 Price-Level Equations (R2) and (N2)—Table 6.4

The price-level equations have the difficulties usually encountered in the stock-adjustment formulation: a tendency for autocorrelation in the residuals to bias the coefficient of the lagged dependent variable toward 1 and the long-run demand variables toward zero.[5] We have included three lagged money shocks in addition to the current one suggested by Carr and Darby (1981). These serve to explain current movements in demand variables in what are nearly first difference in ($\log P - \log M$) equations.

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[4] If, for example, the nonreserve central banks smoothed out the Federal Reserve System's erratic growth-rate changes via an effective sterilization policy, the actual variation in money shocks might be too small to estimate a significant coefficient even though a substantial monetary shock, if it were ever attempted, would have a substantial effect on real income. Although such effective sterilization appears consistent with results reported below, the authors are not agreed on its existence.

[5] The long-run parameter estimates are more stable, of course. For example, five of the long-run permanent income elasticities lie between 0.5 and 1.5, with 0.2 for the United Kingdom and 3.0 for France as the extreme values.

Software difficulties prevented us from trying a correction for autocorrelation.[6]

The fact that current money shocks enter with a coefficient near −1 indicates, since $\log M_j - \hat{M}_j = (\log M_j)^*$, that expected rather than actual money enters in the price-level equation. With a coefficient of −1, money shocks affect the current price level only via indirect interest-rate or real-income effects. The shock-absorber adjustment process suggested by Carr and Darby is thus supported by the data.

The foreign interest-rate channel (β_{j5}) is both significant and of the right sign only for the United Kingdom and Japan. Further, if we recall that interest rates are measured as decimal fractions, we see that both elasticities are very small in absolute value and compared to the elasticity of money demand with respect to the domestic interest rate. Nonetheless we are able to detect some asset substitution in two of our eight countries.

6.2.3 Unemployment-Rate Equations (R3) and (N3)—Table 6.5

The unemployment-rate equations indicate conformity to a dynamic version of Okun's law for the United States, United Kingdom, and France. For the other countries there was no significant correlation between changes in the unemployment rate and past and present changes in real income. As the equation was not required for the model, it was dropped for those countries.

6.2.4 Nominal-Money Equations (R4) and (N4)—Tables 6.6 and 6.7

The U.S. reaction function (R4) reported in table 6.6 indicates a negative impact of lagged inflation on nominal money growth, surprisingly weak (though) positive effects from unexpected real government spending, and a stimulative effect from a two-quarter lagged change in unemployment rate. The time trend term is extremely potent: For plausible steady-state values it increases the growth rate of nominal money from 0.2% per annum in 1956 to 5.9% per annum in 1976. Indeed a constant and time trend alone would explain approximately 31% of the variance of the growth rate of nominal money, with all the other variables together accounting for only another 25%.

Darby (1981) reports on experiments testing other variables which might explain U.S. money growth. The balance of payments entered with coefficients which were trivial, insignificant, and of the wrong sign. The joint test of all coefficients being 0 yielded an $F(3/64)$ statistic of only 0.26 compared to a 95% critical value of 2.75. So the U.S. appears to have determined its monetary policy without regard to its balance of payments (as is appropriate for a fiat reserve country).[7] Although financing the

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[6] The current TROLL system regression package has a program defect when 2SLS and correction for autocorrelation are used simultaneously. France, Germany, Italy, and Japan appear to have significant positive autocorrelation judging from Durbin's h statistic.

[7] See Darby (1980) and chapter 16.

Vietnamese War is a popular explanation of the onset of the inflationary process, neither the fraction of the total labor force in the military nor the number of troops in Vietnam entered the reaction function (R4) at all significantly.[8] So the Vietnamese War apparently had no more effect than any similar sequence of unexpected increases in government spending.

A number of factors have been suggested to explain the gradually rising target level of inflation implicit in the U.S. reaction function. Most—such as the increasing influence of Keynesian economics on politicians—appear unquantifiable and untestable. It may well be that the upward trend reflects acceptance of whatever has been our recent experience, so that the government spending shocks of the Vietnamese War began a dynamic process which has since fed upon itself.

The results for the nonreserve countries are reported in table 6.7. The key element for international transmission is the effect of the balance of payments on the money supply. Table 6.8 indicates what fraction of the balance of payments is not sterilized by the central bank—a value of 1 indicates no sterilization and a value of 0 indicates complete sterilization. During the pegged period, sterilization appears to have been a universal practice, although there was a substantial impact effect of the balance of payments on the German and Japanese nominal money supply. When we take account of lagged adjustments, the money supplies of all countries except Italy appear to respond, albeit partially, to the balance of payments. In principle a lagged adjustment may be sufficient to maintain a pegged exchange-rate system.[9] The continued impact of the balance of payments on nominal money during the floating period is consistent with a joint policy of exchange intervention and monetary adjustments in response to exchange-rate pressures.

6.2.5 Interest-Rate Equations (R5) and (N5)—Table 6.9

The interest-rate equations are somewhat puzzling: A partial adjustment process appears to operate with nominal rather than real interest rates. A partial adjustment process for real interest rates is not ruled out by efficient capital markets, but a partial adjustment process for nominal rates is harder to rationalize. One possibility is that this result reflects an expectational process in the adjustment formulation along lines suggested by Waud (1968). The money shocks and export shocks generally have the expected signs on their impact coefficients (negative and positive, respectively), but real-government-spending shocks generally have a negative impact effect on interest rates. We suspect the solution to these puzzles may lie in the formation of expectations, but leave this as an area for future research.

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[8] Distributed lags of the military variables alone or in combination with the balance-of-payments variables also failed to enter.

[9] The implications of sterilization (and hence endogenous domestic credit) are examined in chapters 10 and 11.

6.2.6 Export Equations (R6) and (N6)—Table 6.10

The export equations indicate that measured price influences are not very strong. An increased real oil price enters as a proxy for increased real income of the rest of the world and has the expected positive sign except for Japan. Foreign real income has much weaker positive impact than would be expected from the absorption approach. The sum of the current and lagged domestic price level is negative for all countries except the U.S. and Canada, but the effects are universally weak. Similarly, foreign prices and the exchange rate generally have weak positive effects.

6.2.7 Import Equations (R7) and (N7P)—Table 6.11

The import demand equations display a *J*-curve type of effect. An increase in relative import prices initially (except for Germany and Italy) increases the nominal value of imports relative to nominal income. Lagged quantity adjustment, indicated by negative coefficients on lagged relative import prices, gradually offsets the initial increase. While the price effects are somewhat stronger here than for exports,[10] there is no evidence of a "law of one price level" operating strongly in the current period.

6.2.8 Relative-Price-of-Imports Equations (N7F)—Table 6.12

During the floating period, we solve the import demand equation for the relative price of imports. The implied parameter estimates are frequently quite different from those in table 6.11. This may be due to biases from the (different) lagged dependent variable which appears in each equation.

6.2.9 Import-Price Equations (R8) and (N8P)—Table 6.13

The import supply equations indicate that increases in foreign prices increase import prices, although the coefficients are insignificant for the United States and Canada. Changes in exchange rates are significantly positive for the four countries which changed their peg during the period of estimation, but not for Canada, Italy, or Japan. Oil prices are important only for the U.S. and perhaps Italy and the Netherlands.

6.2.10 Exchange-Rate Equations (N8F)—Table 6.14

The inverted import supply equations are used to explain exchange-rate movement during the floating period. Although it is somewhat

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[10] This may be because with relatively reliable import price data we can estimate separate import demand and supply equations while the export equation is a market equilibrium equation in which the exchange rate and foreign price level enter directly. That is, an increase in the relative price of imports—for given quantities of imports—increases the ratio of the value of imports to nominal income. An increase in the price level, ceteris paribus, increases the value of exports and nominal income proportionately.

arbitrary in a simultaneous model which one is declared *the* exchange-rate equation, this one was chosen because exchange rates entered most directly and strongly here. The approach clearly worked well for France, Japan, and the Netherlands and not so well for the United Kingdom, Canada, Germany, and Italy. Why this is so is puzzling to us.

6.2.11 Capital-Flows Equations (R9) and (N9)—Table 6.15

The capital-flows equations worked poorly for the United Kingdom and Japan, perhaps reflecting the effectiveness of their capital controls. For the other countries, net capital outflows generally were negatively related (albeit weakly so) either to the exchange-rate adjusted interest differential $[R_j - (4\Delta \log E_{j,t+1})^* - R_1]$ or to changes in this differential, judging from the coefficients estimated on its component parts. But the estimated coefficients are neither large nor precisely estimated as would be suggested by discussions of "interest arbitrage" in the asset approach. Apparently foreign and domestic securities are treated as imperfect substitutes in the portfolio. Alternatively, movements in the differential may reflect changes in the equilibrium value with no flows resulting. These issues are further investigated in chapters 10 and 11.

6.2.12 Balance-of-Payments Equations (N10F)—Table 6.16

These equations attempt to model intervention in the floating exchange-rate markets and include the variables popularly discussed: movements in the exchange rate relative to recent movements or lagged relative inflation rates and the lagged dependent variable. These variables appear to have some explanatory power for intervention except in the French and Dutch cases.

6.2.13 A Check for Omitted Channels

A useful check of model adequacy is to examine cross-correlations of the residuals.[11] A pattern of significant residuals would indicate where we had failed to include important channels of influence. Here we report checks for two classes of residual cross-correlation: (1) within the country submodel and (2) U.S. nominal money, real income, and price level versus all residuals in the foreign submodels.[12] If the model is inadequate, evidence should certainly show up here.

Tables 6.17 and 6.18 report all the significant cross-correlation coefficients obtained for the pegged and floating periods, respectively. The entry "$\rho(\log P_1, R_1) = -0.348^*$" in table 6.17, for example, indicates that the residuals of the U.S. price-level and interest-rate equations (R2)

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[11] We are indebted to Robert P. Flood, Jr., for suggesting this check.

[12] These 923 cross-correlations are the main potential dangers for omitted channels. Given the relatively clean bill of health reported below for these, we did not compute the other 3,989 cross-correlation coefficients.

and (R5), respectively, were negatively correlated during the pegged period; the asterisk indicates that the correlation was significant at the 0.01 level or better. We might infer that our treatment of inflationary expectations was wrong if we focused on this coefficient alone. However, when we look at a large number of residual correlation coefficients, some should appear significant even if all the residuals are drawn from independent white noise processes.

The evidence suggests that we have not missed significant channels of transmission, particularly international channels of transmission. Of the 923 cross-correlation coefficients computed, only 7.8% are significant at the 5% level or better. Among these we have 3.1% of the total significant at the 1% level or better. Further, these small excesses of observed over nominal frequencies are almost entirely due to within-country cross-correlations as detailed in table 6.19. Thus, to the small extent that our simple model has missed significant relations among variables, these omissions appear to be within rather than across countries. Further, as indicated in the notes to tables 6.17 and 6.18, in no case were the same cross-correlations significant in more than two countries;[13] so no pattern of missed channels is indicated. If we wish to consider models comparable across countries, this is about as clean a result as we could hope for. In summary, there appear to be no significant channels of transmission either within or across countries which we have failed to incorporate in the model.

6.3 Conclusions and Areas for Future Research

Our main empirical results can be summarized by the statement that linkages among countries joined by pegged exchange rates appear to be much looser or more elusive than has been assumed in many previous studies, particularly those associated with the monetary approach to the balance of payments. In particular, substantial or complete sterilization of the effects of *contemporaneous* reserve flows on the money supply appears to be a universal practice. This implies, among other things, that domestic credit cannot be properly treated as an exogenous variable and that central banks may have influenced their nominal money supplies despite pegged exchange rates. Much of the remainder of this volume is devoted to further investigation of these issues and their implications.

The estimates reported in this chapter indicate that:

1. The link between countries provided by the price-specie-flow mechanism is not strong and operates only with a lag. There are two reasons for this. First, relative price effects on the balance of trade are not

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[13] In only one case—$\rho(\log y_j, \log P_1)$ for the United Kingdom and Netherlands in the pegged period—were there even two significant cross-correlations of the same type involving cross-country comparisons.

large, although they increase over time. Second, the effect of the balance of payments on the domestic money supply and hence domestic prices is small and operates with a lag. This reflects the apparent practice of sterilization of contemporaneous reserve flows mentioned above.

2. Currency substitution does not seem to provide a significant link between countries. Evidence of currency substitution was found only in the British and Japanese cases, and its magnitudes even there were small.

3. International capital flows do not appear to be very well related to interest differentials (adjusted for expected depreciation). One possible explanation is that we only observe changes in the equilibrium interest-rate differential consistent with risk differences, controls, and the like. The role of capital flows in the transmission of inflation would be small in any case due to sterilization of the effects of reserve flows on the money supply.

4. A *J*-curve phenomena was observed for imports, so that the short-run and long-run effects of variables affecting domestic inflation through the balance of trade (the absorption channel) may differ. This weakens the short-run link between countries on pegged exchange rates relative to the long-run link.

5. The effects of money shocks on real income are much weaker in the countries other than the United States.

6. Money seems to play a shock-absorber role, as emphasized by Carr and Darby, in all of the countries. Innovations in nominal money have little effect on contemporaneous inflation, although there are small contemporaneous effects on real income and interest rates.

These results raise serious questions about a number of popular hypotheses and some widely used assumptions in models of open economies.

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Appendix

The variables described in table 5.1 of the previous chapter generally either are drawn directly from the project data bank (see chapter 3 and the Data Appendix to this volume) or are transformations of such variables. In a few cases minor revisions have been made in the data bank series subsequent to the date in which we placed the variable in the model data set, but in no case were the changes sufficiently substantial to justify reestimation and resimulation of the model.[14] The specific basic data series are summarized in tables 6.20 and 6.21.

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[14] In some cases, the data series names in the Data Appendix will differ slightly from those used here as an indication of such revisions; the correspondence will be obvious from the descriptions. We based our judgment of whether or not to reestimate the whole model on an examination of changes in reestimated regressions of only those equations in which the revised data or their transformations appeared. The only remaining differences are ones that passed this check.

Table 6.1 **Basic Instrument Lists for Computation of Principal Components**[†]

a) United States

Domestic Instruments

$\hat{g}_1$, $\hat{g}_{1,t-1}$, $\hat{g}_{1,t-2}$, $\hat{g}_{1,t-3}$, $\hat{g}_{1,t-4}$, $\log P^{RO}$, $\log P^{RO}_{t-1}$, $(X/Y)^*_1$, $(I/Y)_{1,t-1}$, $\log M_{1,t-1}$, $\hat{M}_{1,t-1}$, $\hat{M}_{1,t-2}$, $\hat{M}_{1,t-3}$, $\log P_{1,t-1}$, $(\log P_{1,t-1} - \log P_{1,t-3})$, $(\log P_{1,t-3} - \log P_{1,t-5})$, $\log P^I_{1,t-1}$, $R_{1,t-1}$, $R_{1,t-2}$, $R_{1,t-3}$, $u_{1,t-1}$, $u_{1,t-2}$, $u_{1,t-3}$, $u_{1,t-4}$, $(X/Y)_{1,t-1}$,$(X/Y)_{1,t-2}$, $\hat{x}_{1,t-1}$, $\hat{x}_{1,t-2}$, $\hat{x}_{1,t-3}$, $\log y_{1,t-1}$, $Z_{1,t-2}$

Fitted Foreign Instruments[§]

$(\log P^R_1)^{\mathrm{FIT}}$, $(\log P^R_{1,t-1})^{\mathrm{FIT}}$, $(\log y^R_1)^{\mathrm{FIT}}$, $(\log y^R_{1,t-1})^{\mathrm{FIT}}$, $(R_2)^{\mathrm{FIT}}$, $(R_{2,t-1})^{\mathrm{FIT}}$, $(R_{2,t-2})^{\mathrm{FIT}}$, $(R_{2,t-3})^{\mathrm{FIT}}$,

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b) Nonreserve Countries

Domestic Instruments

$[DF_j, DF_{j,t-1}]$,[‡] $\hat{g}_j$, $\hat{g}_{j,t-1}$, $\hat{g}_{j,t-2}$, $\hat{g}_{j,t-3}$, $\hat{g}_{j,t-4}$, $\log P^{RO}$, $\log P^{RO}_{t-1}$, $(X/Y)^*_j$, $(I/Y)_{j,t-1}$, $\log M_{j,t-1}$, $\hat{M}_{j,t-1}$, $\hat{M}_{j,t-2}$, $\hat{M}_{j,t-3}$, $\log P_{j,t-1}$, $(\log P_{j,t-1} - \log P_{j,t-3})$, $(\log P_{j,t-3} - \log P_{j,t-5})$, $\log P^I_{j,t-1}$, $R_{1,t-1}$, $R_{1,t-2}$, $R_{1,t-3}$, $(X/Y)_{j,t-1}$, $(X/Y)_{j,t-2}$, $\hat{x}_{j,t-1}$, $\hat{x}_{j,t-2}$, $\hat{x}_{j,t-3}$, $(B/Y)_{j,t-1}$, $(B/Y)_{j,t-2}$, $[(B/Y)_{j,t-3} + (B/Y)_{j,t-4}]$, $\log y_{j,t-1}$, $Z_{j,t-2}$, $[u_{j,t-1}, u_{j,t-2}, u_{j,t-3}, u_{j,t-4}]$[#]

Fitted Foreign Instruments[§]

$(\log P^R_j)^{\mathrm{FIT}}$, $(\log P^R_{j,t-1})^{\mathrm{FIT}}$, $(\log y^R_j)^{\mathrm{FIT}}$, $(\log y^R_{j,t-1})^{\mathrm{FIT}}$, $(R_1)^{\mathrm{FIT}}$, $(R_{1,t-1})^{\mathrm{FIT}}$, $(R_{1,t-2})^{\mathrm{FIT}}$, $(R_{1,t-3})^{\mathrm{FIT}}$

[†] Certain variables listed as predetermined are not listed here because of extreme multicollinearity with listed variables or because they are not predetermined generally for the whole sample period.

[§] Fitted foreign instruments (indicated by superscript $^{\mathrm{FIT}}$) are obtained by fitting $\log y_j$, $\log P_j$, and R_j on the domestic instruments for country j for $j = 1, \ldots, 8$. The indices $(\log y^R_j)^{\mathrm{FIT}}$ and $(\log P^R_j)^{\mathrm{FIT}}$ are obtained by applying (R18), (R19), (N18), and (N19) using the weights in table 5.7.

[‡] The DF_j variables are included only for estimates spanning the entire period; i.e. they are omitted in estimates made for only the pegged or floating period.

[#] For nonreserve countries other than the United Kingdom and France, $\log y_j - \log y^P_j$ is substituted for u_j.

Table 6.2 **Real-Income Equations** (R1) **and** (N1)

$$\log y_j = \alpha_{j1} + \alpha_{j2}\log y^P_{j,t-1} + (1-\alpha_{j2})\log y_{j,t-1} + \sum_{i=0}^{3}\alpha_{j,3+i}\hat{M}_{j,t-i} + \sum_{i=0}^{3}\alpha_{j,7+i}\hat{g}_{j,t-i}\sum_{i=0}^{3}\alpha_{j,11+i}\hat{x}_{j,t-i} + \epsilon_{j1}$$

	US	UK	CA	FR	GE	IT	JA	NE
Coefficients								
α_{j1}	.0079	.0056	.0108	.0125	.0108	.0114	.0204	.0100
	(.0010)	(.0016)	(.0014)	(.0020)	(.0015)	(.0015)	(.0017)	(.0015)
	8.082	3.533	7.845	6.219	7.233	7.636	11.710	6.591
α_{j2}	.0747	.2259	.1376	.0833	.0457	.0275	−.0178	.0756
	(.0352)	(.0867)	(.0613)	(.0695)	(.0425)	(.0447)	(.0351)	(.0547)
	2.124	2.605	2.245	1.198	1.076	.615	−.508	1.381
α_{j3}	.7784	−.1974	.3020	−.2651	.3515	.0939	.1427	.3078
	(.3116)	(.1418)	(.1644)	(.3130)	(.1571)	(.1401)	(.1725)	(.1496)
	2.498	−1.392	1.837	−.847	2.238	.670	.827	2.058
α_{j4}	.5902	.0404	.2068	.0688	.0694	.0791	.1083	.1988
	(.2208)	(.1008)	(.1052)	(.1848)	(.1107)	(.0993)	(.1148)	(.1237)
	2.673	.401	1.966	.372	.627	.796	.944	1.607
α_{j5}	−.0470	−.0262	.1044	.1001	−.0173	.2768	.1856	.0352
	(.2305)	(.0954)	(.1057)	(.1823)	(.1094)	(.1033)	(.1141)	(.1221)
	−.204	−.275	.988	.549	−.158	2.680	1.627	.288
α_{j6}	.8172	−.1269	.1943	−.0552	.0408	−.0176	.0884	.0237
	(.2326)	(.0930)	(.1022)	(.1776)	(.1105)	(.1100)	(.1140)	(.1115)
	3.513	−1.365	1.901	−.311	.369	−.160	.775	.212
α_{j7}	−.0345	.1831	−.0049	.0447	−.0349	−.0014	.0443	.0352
	(.0545)	(.0540)	(.0554)	(.0411)	(.0275)	(.0105)	(.0362)	(.0366)
	−.632	3.395	−.088	1.089	−1.273	−.129	1.223	.962

α_{j8}	.1128	.0274	−.1641	.0075	.0286	.0006	−.0196	−.0586
	(.0573)	(.0603)	(.0604)	(.0415)	(.0276)	(.0102)	(.0371)	(.0385)
	1.969	.454	−2.714	.180	1.033	.058	−.527	−1.520
α_{j9}	.0547	.1069	−.0283	.0518	−.0076	−.0016	.0450	−.0014
	(.0545)	(.0575)	(.0536)	(.0409)	(.0271)	(.0100)	(.0361)	(.0373)
	1.002	1.860	−.528	1.265	−.281	.163	1.247	−.036
α_{j10}	.0837	−.0240	−.0135	.0164	.0139	.0274	−.0393	.0180
	(.0563)	(.0571)	(.0547)	(.0403)	(.0273)	(.0102)	(.0366)	(.0378)
	1.489	−.420	−.247	.408	.510	2.700	−1.074	.477
α_{j11}	.7428	.1897	.6833	.3427	.2780	−.3343	−2.0920	−.1159
	(.4943)	(.2348)	(.3606)	(.4893)	(.2648)	(.2931)	(1.0645)	(.1312)
	1.503	.808	1.895	.700	1.050	−1.141	−1.965	−.884
α_{j12}	.4548	.4127	.1648	−.7154	−.2451	−.0443	.3499	−.1186
	(.4148)	(.1799)	(.2401)	(.3847)	(.2215)	(.1897)	(.9034)	(.0961)
	1.097	2.293	.687	−1.860	−1.107	−.233	.387	−1.235
α_{j13}	−.0415	−.2129	−.0287	.0153	−.3293	−.2277	−1.7648	.0943
	(.4282)	(.1886)	(.2358)	(.3919)	(.2339)	(.1967)	(.9331)	(.0884)
	−.097	−1.129	−.122	.039	−1.408	−1.158	−1.891	1.066
α_{j14}	−.9251	.0069	.5699	.1215	−.5084	−.4655	−.7337	−.1334
	(.4255)	(.1916)	(.2495)	(.4069)	(.2268)	(.1995)	(.9308)	(.0847)
	−2.174	.036	2.284	.299	−2.242	−2.333	−.788	−1.575
$\bar{R}^2$	.9982	.9923	.9982	.9969	.9974	.9978	.9992	.9977
S.E.E.	.0087	.0140	.0122	.0180	.0133	.0131	.0155	.0134
D-W	1.81	1.91	2.42	2.13	1.94	2.22	1.97	1.71

Note. Period: 1957I–74IV. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

Table 6.3 **F Statistics for Groups of Demand Shock Variables for Estimates in Table 6.2**

	$F(4/66)$ Statistics		
Country	$\hat{M}$ Variables	$\hat{g}$ Variables	$\hat{x}$ Variables
US	7.128	1.820	2.188
UK	1.164	3.531	1.763
CA	2.315	3.191	1.858
FR	0.341	0.783	1.006
GE	1.473	0.748	2.353
IT	2.201	2.004	1.766
JA	1.152	1.141	1.660
NE	1.530	1.137	1.675

Notes. The reported F statistics are appropriate for testing the joint hypothesis that all four of the demand shock variables of the type indicated have a coefficient of zero. Such a test is conditional upon the other variables entering in the equation.

For $F(4/66)$, the 10% significance level is 2.04, the 5% significance level is 2.52, and the 1% significance level is 3.63.

Table 6.4 **Price Level Equations** (R2) **and** (N2)

$$\log P_j = \log M_j + \beta_{j1} + \beta_{j2} \log y_j^P + \beta_{j3}(\log y_j - \log y_j^P) + \beta_{j4} R_j + \beta_{j5}[R_1 + (4\Delta \log E_{j,t+1})^*]^+ + \beta_{j6}(\log M_{j,t-1} - \log P_{j,t-1}) + \sum_{i=0}^{3} \beta_{j,7+i} \hat{M}_{j,t-i} + \epsilon_{j2}$$

	US	UK	CA	FR	GE	IT	JA	NE
Coefficients								
β_{j1}	.0851	−.2409	.1175	−.0692	.0818	.1672	.4466	−.0057
	(.1067)	(.1361)	(.0421)	(.0554)	(.0517)	(.2679)	(.1109)	(.0417)
	.798	−1.770	2.789	1.248	1.583	.624	4.026	−.136
β_{j2}	−.0224	−.0313	−.2196	−.0247	−.0662	−.0648	−.2017	−.0796
	(.0058)	(.0282)	(.0368)	(.0250)	(.0228)	(.0480)	(.0363)	(.0332)
	−3.863	−1.113	−5.967	−.987	−2.900	−1.349	−5.562	−2.397
β_{j3}	−.0915	−.3687	−.1519	−.0189	−.0062	−.0430	−.0621	.0938
	(.0199)	(.1490)	(.0678)	(.0576)	(.0255)	(.0781)	(.0421)	(.0526)
	−4.601	−2.476	−2.242	−.328	−.245	−.550	−1.474	1.785
β_{j4}	.3489	.4405	.2487	.4813	.0227	.1183	.9316	.0227
	(.0685)	(.1694)	(.1372)	(.0852)	(.0448)	(.1588)	(.4464)	(.0945)
	5.094	2.601	1.813	5.647	.506	.745	2.087	.241
β_{j5}	−.0011	.0815	−.0209	.0239	−.0089	−.0378	.0873	−.0397
	(.0117)	(.0355)	(.0981)	(.0196)	(.0168)	(.0397)	(.0376)	(.0288)
	−.097	2.295	−.213	1.216	−.527	−.951	2.322	−1.380

Table 6.4 (continued)

	US	UK	CA	FR	GE	IT	JA	NE
β_{j6}	−.9907	−.8571	−.6260	−.9918	−.9335	−.9485	−.8273	−.8941
	(.0248)	(.0548)	(.0606)	(.0203)	(.0200)	(.0255)	(.0296)	(.0347)
	−39.974	−15.646	−10.329	−48.824	−46.760	−37.190	−27.963	−25.750
β_{j7}	−.7145	−.7401	−1.0824	−.7633	−1.0874	−1.2105	−1.0066	−1.0174
	(.1503)	(.1734)	(.1504)	(.1927)	(.0774)	(.1280)	(.1165)	(.1271)
	−4.754	−4.269	−7.199	−3.962	−14.049	−9.456	−8.640	−8.008
β_{j8}	−.3961	.0374	−.2690	−.2414	−.1448	−.1738	−.3656	−.4761
	(.0924)	(.1065)	(.1080)	(.1111)	(.0518)	(.0900)	(.0839)	(.0866)
	−4.288	.351	−2.491	−2.172	−2.798	−1.932	−4.358	−5.497
β_{j9}	.1655	−.1519	−.2761	.0248	−.3170	−.3615	−.3207	−.6534
	(.0914)	(.1009)	(.1046)	(.1059)	(.0521)	(.0925)	(.0849)	(.0889)
	1.810	−1.506	−2.641	.234	−6.084	−3.909	−3.779	−7.352
β_{j10}	.0164	−.1675	−.6435	.0494	−.3196	−.1435	−.3017	−.2813
	(.1028)	(.0996)	(.1051)	(.1045)	(.0571)	(.0951)	(.0876)	(.0868)
	.160	−1.681	−6.212	.473	−5.601	−1.509	−3.445	−3.243
$\bar{R}^2$	.9997	.9983	.9978	.9987	.9993	.9988	.9987	.9989
S.E.E.	.0035	.0147	.0116	.0105	.0063	.0117	.0119	.0109
h [D-W]§	1.69	.66	−1.64	3.57	2.85	[1.54]	2.67	−1.92

Note. Period: 1957I–76IV. Standard errors are in parentheses below coefficient estimates; t statistics are below the standard errors.

†For the United States, the foreign interest rate is $R_2 - (4\Delta \log E_{2,t+1})^*$.

§The biased Durbin-Watson statistic is reported in square brackets in those cases in which Durbin's h cannot be computed (is imaginary).

Table 6.5 **Unemployment-Rate Equations (R3) and (N3)**

$$u_j = u_{j,t-1} + \gamma_{j1} + \sum_{i=0}^{7} \gamma_{j,2+i}\Delta \log y_{j,t-i} + \epsilon_{j3}$$

	US	UK	FR
Coefficients			
γ_{j1}	.0046	.0023	.0019
	(.0004)	(.0003)	(.0003)
	11.183	7.031	6.648
γ_{j2}	−.1952	−.0849	−.0339
	(.0277)	(.0162)	(.0077)
	−7.055	−5.252	−4.385
γ_{j3}	−.1876	−.0327	−.0360
	(.0241)	(.0125)	(.0058)
	−7.802	−2.616	−6.202
γ_{j4}	−.0528	−.0660	−.0240
	(.0235)	(.0122)	(.0060)
	−2.248	−5.407	−4.010
γ_{j5}	−.0624	−.0556	−.0125
	(.0232)	(.0125)	(.0059)
	−2.691	−4.437	−2.116
γ_{j6}	.0529	−.0415	−.0037
	(.0234)	(.0126)	(.0059)
	2.257	−3.300	−.628
γ_{j7}	.0177	−.0165	−.0116
	(.0237)	(.0126)	(.0060)
	.746	−1.311	−1.944
γ_{j8}	−.0349	−.0057	.0005
	(.0244)	(.0129)	(.0060)
	−1.431	−.444	.079
γ_{j9}	−.0602	.0004	.0074
	(.0226)	(.0126)	(.0058)
	−2.668	.028	1.285
$\bar{R}^2$	.8089	.4428	.4492
S.E.E.	.0019	.0016	.0009
D-W	1.36	1.26	1.40

Note. Period: 1957I–76IV. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

Table 6.6 **Reserve-Country Nominal-Money Equation** (R4)

$$\begin{array}{lllll}
\Delta \log M_1 = 0.4612\,\Delta \log M_{1,t-1} & -\,0.2295\,\Delta \log M_{1,t-2} & +\,0.0044 & +\,0.0003t \\
\qquad\quad (0.1158) & (0.1159) & (0.0028) & (0.0000) \\
\qquad\quad 3.984 & -1.981 & 1.587 & 5.057
\end{array}$$

$$\begin{array}{lll}
+\,0.0040\hat{g}_1 & +\,0.0016(\hat{g}_{1,t-1} + \hat{g}_{1,t-2}) & +\,0.0293(\hat{g}_{1,t-3} + \hat{g}_{1,t-4}) \\
(0.0286) & (0.0205) & (0.0200) \\
0.141 & 0.076 & 1.465
\end{array}$$

$$\begin{array}{lll}
-\,0.0576(\log P_{1,t-1} - \log P_{1,t-3}) & -\,0.2372(\log P_{1,t-3} - \log P_{1,t-5}) & -\,0.1167u_{1,t-1} \\
(0.0905) & (0.0996) & (0.1930) \\
-0.636 & -2.381 & -0.604
\end{array}$$

$$\begin{array}{lll}
+\,0.5393u_{1,t-2} & -\,0.4316u_{1,t-3} & -\,0.0546u_{1,t-4} \\
(0.3627) & (0.3670) & (0.1950) \\
1.487 & -1.176 & -0.280
\end{array}$$

$$\bar{R}^2 = 0.5624, \quad \text{S.E.E.} = 0.0046, \quad [\text{D-W} = 2.05]^{\dagger}$$

Note. Period: 1957I–76IV. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

[†] The biased Durbin-Watson statistic is reported in square brackets because Durbin's *h* cannot be computed (is imaginary).

Table 6.7 **Nonreserve-Country Nominal-Money Equations (N4)**

$$\Delta \log M_j = \eta_{j1} + \eta_{j2}t + \eta_{j3}\hat{g}_j + \eta_{j4}(\hat{g}_{j,t-1} + \hat{g}_{j,t-2}) + \eta_{j5}(\hat{g}_{j,t-3} + \hat{g}_{j,t-4}) + \eta_{j6}(\log P_{j,t-1} - \log P_{j,t-3}) + \eta_{j7}[DF_j(\log P_{j,t-1} - \log P_{j,t-3})] + \eta_{j8}(\log P_{j,t-3} - \log P_{j,t-5}) + \eta_{j9}[DF_j(\log P_{j,t-3} - \log P_{j,t-5})] + \eta_{j,10}u_{j,t-1} + \eta_{j,11}u_{j,t-2} + \eta_{j,12}u_{j,t-3} + \eta_{j,13}u_{j,t-4} + \eta_{j14}(B/Y)_j + \eta_{j,15}[DF_j(B/Y)_j] + \eta_{j,16}[(B/Y)_{j,t-1} + (B/Y)_{j,t-2}] + \eta_{j17}\{DF_j[(B/Y)_{j,t-1} + (B/Y)_{j,t-2}]\} + \eta_{j,18}[(B/Y)_{j,t-3} + (B/Y)_{j,t-4}] + \eta_{j,19}\{DF_j[(B/Y)_{j,t-3} + (B/Y)_{j,t-4}]\} + \epsilon_{j4}$$

	UK	CA	FR	GE	IT	JA	NE
Coefficients							
η_{j1}	−.0058	.0101	.0354	.0160	.0167	.0540	.0097
	(.0103)	(.0055)	(.0051)	(.0090)	(.0117)	(.0067)	(.0070)
	−.561	1.841	6.936	1.793	1.434	8.026	1.375
η_{j2}	−.0000	.0002	−.0003	−.0001	.0004	−.0000	.0003
	(.0002)	(.0002)	(.0001)	(.0001)	(.0002)	(.0001)	(.0001)
	−.003	1.001	−2.517	−.586	2.363	−.149	2.151
η_{j3}	.0874	.1156	.0030	.0363	−.0145	−.0219	.0641
	(.0656)	(.0760)	(.0254)	(.0305)	(.0232)	(.0422)	(.0405)
	1.333	1.521	.119	1.192	−.622	−.518	1.582
η_{j4}	.1540	.1849	.0307	−.0149	−.0342	.0317	−.0395
	(.0562)	(.0613)	(.0221)	(.0232)	(.0208)	(.0426)	(.0307)
	2.741	3.018	1.387	−.644	−1.647	.744	−1.286
η_{j5}	.0299	−.0035	−.0178	−.0225	−.0317	.0262	−.0397
	(.0661)	(.0655)	(.0228)	(.0227)	(.0222)	(.0388)	(.0312)
	.452	−.054	−.781	−.993	−1.430	.676	−1.274

Table 6.7 (continued)

	UK	CA	FR	GE	IT	JA	NE
η_{j6}	.0771	−.1972	−.0859	.0977	−.0956	−.5453	−.2390
	(.2107)	(.5889)	(.0989)	(.2470)	(−.2764)	(.1811)	(.1639)
	.366	−.334	−.868	.395	−.346	−3.011	−1.458
η_{j7}	.0242	.2649	.5748	−.8816	.0372	.4078	.3620
	(.2218)	(.5583)	(.3598)	(.3516)	(.3573)	(.2181)	(.2675)
	.109	.474	1.597	−2.507	.1041	1.870	1.353
η_{j8}	.1567	−.1133	−.0535	−.4020	.2625	−.2006	.0566
	(.2396)	(.6025)	(.0972)	(.2971)	(.2601)	(.1490)	(.1628)
	.654	−.188	−.551	−1.353	1.009	−1.346	.348
η_{j9}	−.0748	−.0016	−.3655	.6823	−.1297	.0145	.0622
	(.2727)	(.5691)	(.4059)	(.4041)	(.4102)	(.2135)	(.2397)
	−.274	−.003	−.900	1.688	−.316	.068	.260
η_{j10}	1.2313	−.1548	1.5859	.0364	−.1055	−.0059	−.0338
	(1.5107)	(.1785)	(1.8373)	(.1331)	(.2265)	(.1410)	(.1589)
	.815	−.867	.863	.274	−.466	−.042	−.213
η_{j11}	−3.4256	.0546	−4.0365	−.1024	.1264	.0221	−.3617
	(2.3092)	(.2149)	(3.2469)	(.1684)	(.2788)	(.1697)	(.2141)
	−1.483	.254	−1.243	−.608	.453	.130	−1.690
η_{j12}	7.0718	.0777	7.8250	.1912	−.1260	.1636	.3568
	(2.5266)	(.2193)	(3.3058)	(.1734)	(.2759)	(.1724)	(.2104)
	2.799	.354	2.367	1.103	−.457	.949	1.696

η_{j13}	-4.2754	.0413	-5.0553	-.0848	.3273	-.3035	.0288
	(1.7219)	(.2003)	(2.1008)	(.1297)	(.2263)	(.1343)	(.1524)
	-2.483	.206	-2.406	-.653	1.446	-2.260	.189
η_{j14}	-.5155	-.1068	-.4060	1.6489	-5.7268	2.2503	.4210
	(.5838)	(1.2418)	(.6601)	(.5769)	(2.5394)	(1.2800)	(.8439)
	-.883	-.086	-.615	2.858	-2.255	1.758	.499
η_{j15}	2.1291	3.3238	.1031	.0196	6.5592	-.5742	.7008
	(1.0068)	(2.3210)	(1.1007)	(.8884)	(3.0475)	(1.5246)	(1.4222)
	2.115	1.432	.094	.022	2.152	-.377	.493
η_{j16}	.4856	.8225	.3233	.0938	2.5421	1.5380	.3972
	(.2139)	(.5970)	(.3260)	(.2371)	(1.1070)	(.6816)	(.3402)
	2.270	1.378	.992	.395	2.296	2.256	1.168
η_{j17}	-.5212	-3.2249	-.1322	.3328	-.6868	-2.5332	-1.1151
	(.3625)	(1.2196)	(.5630)	(.4828)	(1.0566)	(.8004)	(.6231)
	-1.438	-2.644	-.235	.689	-.650	-3.165	-1.790
η_{j18}	.3309	.2862	.7214	.5458	-.3723	1.8032	.0915
	(.2078)	(.6238)	(.2587)	(.2864)	(.7726)	(.7378)	(.2997)
	1.592	.459	2.788	1.906	-.482	2.444	.305
η_{j19}	-.2042	1.4646	.0605	.0399	.8100	-1.8875	-.9712
	(.3388)	(1.1676)	(.5414)	(.4740)	(1.0940)	(.8633)	(.5983)
	-.603	1.254	.112	.084	.740	-2.186	-1.623
$\bar{R}^2$	.2888	.1540	.3474	.2765	-.6681	.4160	.2950
S.E.E.	.0170	.0163	.0118	.0133	.0224	.0155	.0148
D-W	1.95	1.88	1.78	2.30	2.11	1.65	1.87

Note. Period: 1957I–76IV. Standard errors are in parentheses below coefficient estimates; t statistics are below the standard errors.

Table 6.8 **Interpretation of $(B/Y)_j$ Coefficients in Table 6.7**

	Pegged Period		Floating Period		
Country	Impact Money Effect[†]	Cumulative Money Effect[§]	Impact Money Effect[†]	Cumulative Money Effect[§]	Mean Value of $(H/Y)_j$[‡]
UK	−0.058	0.125	0.181	0.201	0.1122
CA	−0.007	0.138	0.210	0.125	0.0652
FR	−0.057	0.235	−0.042	0.229	0.1394
GE	0.158	0.280	0.160	0.353	0.0957
IT	−0.926	−0.224	0.135	0.876	0.1617
JA	0.165	0.656	0.123	−0.035	0.0734
NE	0.045	0.150	0.121	−0.223	0.1076

[†] This is the fraction of the current effect of the balance of payments on nominal money which is *not* sterilized by the central bank; computed as $(\partial\Delta \log M_j)/[\partial(B/H)_j] \approx$ [coefficient of $(B/Y)_j$] × [mean value of $(H/Y)_j$], where H_j is high-powered money.

[§] This is the total effect including lagged adjustments by the central bank; computed as $(\partial\Delta \log M_j)/[\partial(B/H)_j] \approx [\Sigma_i$ coefficients of $(B/Y)_{j,t-i}]$ × [mean value of $(H/Y)_j$].

[‡] Sample mean for 1957I–76IV.

Table 6.9 **Interest-Rate Equations** (R5) **and** (N5)

$$R_j = \delta_{j1} + \delta_{j2}t + \delta_{j3}(4\Delta \log P_{j,t+1})^* + \delta_{j4}R_{j,t-1} + \delta_{j5}(4\Delta \log P_j)^* + \sum_{i=0}^{3} \delta_{j,6+i}\hat{M}_{j,t-i} + \sum_{i=0}^{3} \delta_{j,10+i}\hat{g}_{j,t-i} + \sum_{i=0}^{3} \delta_{j,14+i}\hat{x}_{j,t-i} + \epsilon_{j5}$$

	US	UK	CA	FR	GE	IT	JA	NE
Coefficients								
δ_{j1}	.0059	.0016	.0037	.0049	.0003	−.0031	−.0019	.0059
	(.0023)	(.0061)	(.0023)	(.0033)	(.0042)	(.0020)	(.0021)	(.0035)
	2.584	.262	1.622	1.481	.068	−1.523	−.907	1.708
δ_{j2}	.0000	.0002	−.0001	.0002	.0000	.0000	−.0001	.0001
	(.0000)	(.0001)	(.0001)	(.0001)	(.0001)	(.0000)	(.0000)	(.0001)
	.455	1.985	−1.599	2.767	.440	.406	−6.182	1.422
δ_{j3}	.2085	.0018	.0949	.1369	.2868	.0246	.0393	−.1238
	(.1035)	(.0449)	(.0320)	(.0680)	(.1703)	(.0280)	(.0107)	(.0716)
	2.015	.041	2.963	2.012	1.684	.878	3.674	−1.727
δ_{j4}	.7577	.8761	.9951	.6435	.7940	1.0404	1.0043	.7998
	(.0991)	(.1277)	(.0854)	(.1050)	(.0929)	(.0370)	(.0249)	(.0740)
	7.649	.861	11.651	6.117	8.545	28.086	40.282	10.813
δ_{j5}	−.1046	−.0223	.0060	.0124	−.0695	−.0200	.0333	.0451
	(.0865)	(.0287)	(.0215)	(.0663)	(.1215)	(.0229)	(.0076)	(.0547)
	−1.210	−.776	.278	.187	−.572	−.872	4.406	.826
δ_{j6}	−.3230	−.3059	−.0782	−.4602	.1307	−.0204	−.0100	.0784
	(.2031)	(.0866)	(.1056)	(.1576)	(.1349)	(.0492)	(.0101)	(.1192)
	−1.590	−3.533	−.741	−2.920	.969	−.415	−.988	.658

Table 6.9 (continued)

	US	UK	CA	FR	GE	IT	JA	NE
δ_{j7}	.3091	.0254	.0153	−.1887	.0757	.0046	−.0276	−.1676
	(.1334)	(.0692)	(.0662)	(.0938)	(.0961)	(.0345)	(.0086)	(.0949)
	2.317	.367	.231	−2.012	.788	.134	−3.202	−1.766
δ_{j8}	.0917	.0365	.1491	−.0914	.1094	.0479	−.0380	.1154
	(.1256)	(.0586)	(.0671)	(.1011)	(.1052)	(.0328)	(.0080)	(.0941)
	.730	.622	2.223	−.904	1.040	1.464	−4.734	1.226
δ_{j9}	.1624	.0851	.1540	.0367	.0585	.0274	−.0194	.0062
	(.1186)	(.0557)	(.0606)	(.1018)	(.1017)	(.0340)	(.0071)	(.0810)
	1.369	1.527	2.543	.361	.575	.807	−2.737	.077
δ_{j10}	−.0205	−.0524	−.0614	−.0278	−.0239	−.0053	.0005	.0024
	(.0294)	(.0309)	(.0282)	(.0215)	(.0237)	(.0032)	(.0022)	(.0270)
	−.696	−1.694	−2.175	−1.290	−1.010	−1.663	.220	.088
δ_{j11}	.0189	.0229	−.0020	.0167	.0028	−.0059	.0029	.0004
	(.0304)	(.0325)	(.0308)	(.0208)	(.0235)	(.0031)	(.0023)	(.0271)
	.622	.703	−.065	.804	.118	−1.915	1.266	.015
δ_{j12}	.0229	.0142	.0556	−.0161	−.0128	−.008	.0009	.0066
	(.0288)	(.0307)	(.0296)	(.0217)	(.0242)	(.0035)	(.0025)	(.0256)
	.797	.462	1.878	−.743	−.529	−.218	.359	.259
δ_{j13}	.0154	.0015	.0307	−.0079	.0167	−.0033	.0006	.0161
	(.0302)	(.0316)	(.0282)	(.0207)	(.0260)	(.0033)	(.0024)	(.0263)
	.509	.046	1.088	−.384	.641	−1.005	.257	.611

δ_{j14}	.6220	.1849	−.0079	.2001	.2022	.2097	.0074	.1605
	(.2585)	(.1683)	(.1792)	(.2551)	(.2741)	(.0945)	(.0709)	(.0920)
	2.407	1.099	−.044	.784	.738	2.220	.104	1.744
δ_{j15}	.3002	.0184	.0373	.1224	−.2416	.1516	−.0252	.0721
	(.2448)	(.1366)	(.1262)	(.2146)	(.2058)	(.0601)	(.0549)	(.0678)
	1.226	.135	.295	.570	−1.174	2.521	−.459	1.064
δ_{j16}	.5449	−.0039	−.0140	.3068	.0877	.0547	.0257	.0338
	(.2549)	(.1278)	(.1182)	(.2033)	(.2014)	(.0627)	(.0573)	(.0622)
	2.138	−.031	−.118	1.509	.435	.871	.448	.544
δ_{j17}	−.2137	.1883	−.0327	.0768	−.2494	−.0098	.0023	.0736
	(.2339)	(.1174)	(.1330)	(.2116)	(.1937)	(.0633)	(.0581)	(.0599)
	−.914	1.603	−.246	.363	−1.288	−.154	.039	1.229
$\bar{R}^2$	.9267	.9109	.8996	.8764	.8120	.9586	.9782	.7489
S.E.E.	.0046	.0078	.0060	.0089	.011	.0040	.0009	.0091
h [D-W][†]	−.28	[1.82]	1.84	[1.63]	[1.67]	[1.70]	2.28	[1.67]

Note. Period: 1957I–76IV. Standard errors are in parentheses below coefficient estimates; t statistics are below the standard errors.

[†] The biased Durbin-Watson statistic is reported in square brackets in those cases in which Durbin's h cannot be computed (is imaginary).

Table 6.10 **Export Equations** (R6) **and** (N6)

$$(X/Y)_j = \theta_{j1} + \theta_{j2}t + \theta_{j3}\log P^{RO} + \theta_{j4}(\log y_j - \log y_j^P) + \sum_{i=0}^{1}\theta_{j,5+i}(X/Y)_{j,t-1-i} + \sum_{i=0}^{1}\theta_{j,7+i}\log y^R_{j,t-i} + \sum_{i=0}^{1}\theta_{j,9+i}\log P_{j,t-i}$$

$$+ \sum_{i=0}^{1}\theta_{j,11+i}\log P^R_{j,t-i}\left[+ \sum_{i=0}^{1}\theta_{j,13+i}\log E_{j,t-i} + \sum_{i=0}^{1}\theta_{j,15+i}DF_{j,t-i}\log E_{j,t-i}\right]^{\dagger} + \epsilon_{j6}$$

	US	UK	CA	FR	GE	IT	JA	NE
Coefficients								
θ_{j1}	.0976	.6132	.2497	.1831	.1097	−.8423	−.0395	.2820
	(.0189)	(.0805)	(.0884)	(.0657)	(.0523)	(.1945)	(.0820)	(.1430)
	5.169	7.618	2.826	2.785	2.099	−4.331	−.482	1.972
θ_{j2}	−.0012	−.0035	−.0025	−.0052	−.0010	−.0017	−.0002	−.0026
	(.0003)	(.0010)	(.0013)	(.0011)	(.0011)	(.0010)	(.0003)	(.0026)
	−4.356	−3.511	−1.863	−4.890	−.938	−1.625	−.616	−1.009
θ_{j3}	.0138	.0148	.0089	.0139	.0296	.0188	−.0028	.0321
	(.0026)	(.0064)	(.0072)	(.0049)	(.0053)	(.0075)	(.0034)	(.0150)
	5.356	2.325	1.234	2.846	5.616	2.502	−.826	2.146
θ_{j4}	.0299	−.0384	−.0688	.0111	.0435	−.0962	−.0405	.1931
	(.0161)	(.0695)	(.0790)	(.0448)	(.0426)	(.0726)	(.0139)	(.1629)
	1.855	−.553	−.871	.248	1.021	−1.335	−2.919	1.186
θ_{j5}	.5326	.1784	.2876	.1989	.3689	.2681	.2783	.4754
	(.1193)	(.1276)	(.1277)	(.1119)	(.1216)	(.1213)	(.1064)	(.1250)
	4.466	1.398	2.251	1.778	3.034	2.211	2.615	3.802

θ_{j6}	.0723	.1021	.3141	.2406	.1134	.2652	.1423	.0819
	(.1077)	(.1025)	(.1146)	(.0967)	(.1285)	(.1214)	(.1095)	(.1281)
	.671	.996	2.742	2.488	.883	2.185	1.300	.639
θ_{j7}	.0586	−.0101	.1090	.2338	.1931	.0555	−.0967	.6712
	(.0312)	(.1152)	(.1030)	(.1027)	(.1066)	(.1703)	(.0452)	(.2613)
	1.881	−.088	1.058	2.276	1.811	.326	−2.140	2.569
θ_{j8}	.0184	.1624	.1337	.0542	−.0217	.1797	.1139	−.3902
	(.0343)	(.1178)	(.1131)	(.1030)	(.0898)	(.1438)	(.0404)	(.2586)
	.535	1.379	1.182	.526	−.241	1.250	2.821	−1.509
θ_{j9}	.0083	−.1545	.0855	−.0215	−.0665	.0559	.0311	−.5752
	(.0354)	(.0787)	(.0682)	(.0689)	(.1252)	(.0909)	(.0364)	(.2051)
	.234	−1.962	1.254	−.312	−.531	.616	.854	−2.804
θ_{j10}	.0114	−.0952	−.0416	−.0539	−.1939	−.1409	−.0330	.1862
	(.0348)	(.0726)	(.0644)	(.0650)	(.1426)	(.0833)	(.0281)	(.1940)
	.327	−1.312	−.646	−.829	−1.360	−1.690	−1.176	.960
θ_{j11}	.0102	.1635	.0251	.0103	.1815	−.0713	.0617	.8770
	(.0207)	(.1105)	(.0940)	(.0738)	(.1102)	(.1096)	(.0365)	(.2853)
	.491	1.480	.267	.139	1.648	−.651	1.692	3.074
θ_{j12}	−.0085	.3009	−.0552	.2875	.0446	.1265	−.0487	−.4179
	(.0201)	(.0955)	(.0890)	(.0812)	(.0881)	(.0960)	(.0332)	(.2952)
	−.423	3.151	−.621	3.543	.506	1.318	−1.465	−1.415

Table 6.10 (continued)

	US	UK	CA	FR	GE	IT	JA	NE
θ_{j13}	—	.0572	−.1529	.0657	.0408	−.0186	.0250	.1332
		(.0380)	(.0921)	(.0198)	(.0305)	(.0450)	(.0206)	(.0932)
		1.508	−1.661	3.315	1.340	−.412	1.216	1.429
θ_{j14}	—	.1432	.1425	.0670	.0099	.1804	−.0129	−.0657
		(.0424)	(.0960)	(.0258)	(.0272)	(.0474)	(.0176)	(.1155)
		3.382	1.483	2.594	.364	3.804	−.732	−.568
θ_{j15}	—	−.0069	.0852	−.0007	−.0013	.0011	.0003	−.0034
		(.0086)	(.0741)	(.0033)	(.0051)	(.0014)	(.0004)	(.0130)
		−.799	1.150	−.197	−.261	.805	.674	−.260
θ_{j16}	—	.0173	−.0838	−.0038	.0031	−.0005	−.0004	.0002
		(.0099)	(.0702)	(.0034)	(.0057)	(.0013)	(.0005)	(.0143)
		1.747	−1.195	−1.111	.556	−.386	−.865	.0173
$\bar{R}^2$	.9799	.9647	.9500	.9685	.9696	.9727	.7767	.8568
S.E.E.	.0023	.0069	.0062	.0050	.0058	.0071	.0121	.0149
h [D-W]§	[2.06]	[1.96]	[2.05]	−6.42	[1.65]	[2.14]	−.55	[1.49]

Note. Period: 1957I–76IV. Standard errors are in parentheses below coefficient estimates; t statistics are below the standard errors.

† The exchange-rate terms do not appear in the U.S. equation (R6).

§ The biased Durbin-Watson statistic is reported in square brackets in those cases in which Durbin's h cannot be computed (is imaginary).

Table 6.11 **Import Equations** (R7) **and** (N7P)†

$$(I/Y)_j = \lambda_{j1} + \lambda_{j2}(I/Y)_{j,t-1} + \lambda_{j3}\log y_j^P + \sum_{i=0}^{1} \lambda_{j,4+i}(\log y_{j,t-i} - \log y^P_{j,t-i}) + \sum_{i=0}^{3} \lambda_{j,6+i} Z_{j,t-i} + \epsilon_{j7}$$

	US	UK	CA	FR	GE	IT	JA	NE
Coefficients								
λ_{j1}	−.1034	−.3300	−.3403	−.0497	−.3324	−.3432	−.0296	−.9957
	(.0388)	(.0935)	(.2160)	(.0506)	(.1296)	(.2732)	(.0421)	(.7004)
	−2.662	−3.529	−1.576	−.982	−2.566	−1.257	−.703	−1.422
λ_{j2}	.6667	.3540	.2796	.8132	.3815	.7865	.7148	.3908
	(.1128)	(.1405)	(.2134)	(.0918)	(.1505)	(.0919)	(.0945)	(.1504)
	5.910	2.520	1.310	8.858	2.535	8.554	7.561	2.598
λ_{j3}	.0178	.1358	.1164	.0114	.0708	.0350	.0035	.2773
	(.0066)	(.0339)	(.0483)	(.0089)	(.0235)	(.0259)	(.0039)	(.1600)
	2.714	4.004	2.409	1.281	3.015	1.353	.880	1.734
λ_{j4}	.0808	−.1075	−.0179	.0710	.0634	.0927	.0137	.1427
	(.0421)	(.1141)	(.1643)	(.0347)	(.0765)	(.1158)	(.0221)	(.2757)
	1.921	−.942	−.109	2.045	.828	.800	.619	.518
λ_{j5}	−.0644	.0348	.1806	−.0677	.0146	−.0139	.0003	.0428
	(.0368)	(.1026)	(.1252)	(.0306)	(.0653)	(.1098)	(.0202)	(.2168)
	−1.751	.339	1.442	−2.216	.224	−.127	.016	.197

Table 6.11 (continued)

	US	UK	CA	FR	GE	IT	JA	NE
λ_{j6}	.0366	.1425	.1882	.0500	−.0077	−.0401	.0101	.5824
	(.0188)	(.0583)	(.1146)	(.0234)	(.0570)	(.0697)	(.0204)	(.1957)
	1.953	2.446	1.643	2.135	−.135	−.575	.497	2.975
λ_{j7}	.0545	.0890	−.0756	−.0189	.0336	.1494	.0438	−.1574
	(.0349)	(.0628)	(.1167)	(.0253)	(.0660)	(.0812)	(.0250)	(.1955)
	1.562	1.416	−.647	−.747	.510	1.841	1.754	−.805
λ_{j8}	−.0753	−.0320	−.0556	−.0481	.0536	−.1032	−.0001	−.0741
	(.0401)	(.0617)	(.1158)	(.0239)	(.0705)	(.0897)	(.0225)	(.1670)
	−1.877	−.518	−.481	−2.016	.760	−1.151	−.004	−.444
λ_{j9}	.0044	.0145	.0661	.0181	−.0289	.0162	−.0412	−.0417
	(.0230)	(.0471)	(.0910)	(.0186)	(.0485)	(.0621)	(.0161)	(.1344)
	.191	.308	.726	.976	−.595	.260	−2.556	−.310
$\bar{R}^2$	.9746	.8174	.8977	.9383	.9082	.8885	.8612	.7034
S.E.E.	.0027	.0070	.0045	.0033	.0047	.0077	.0017	.0143
h [D-W][§]	[1.97]	[1.83]	[1.75]	−1.08	[1.88]	[1.88]	1.80	[1.96]

Note. Standard errors are in parentheses below coefficient estimates; t statistics are below the standard errors.

[†] For the nonreserve countries, these regressions are estimated over only the pegged portion of 1957I–76IV (excludes floating periods listed in part *a* of table 5.6).

[§] The biased Durbin-Watson statistic is reported in square brackets in those cases in which Durbin's h cannot be computed (is imaginary).

Table 6.12 **Relative-Price-of-Imports Equations** (N7F)

$$Z_j = \frac{-\lambda_{j1}}{\lambda_{j6}} + \frac{1}{\lambda_{j6}}(I/Y)_j - \frac{\lambda_{j2}}{\lambda_{j6}}(I/Y)_{j,t-1} - \frac{\lambda_{j3}}{\lambda_{j6}}\log y_j^P - \sum_{i=0}^{1}\frac{\lambda_{j,4+i}}{\lambda_{j6}}(\log y_{j,t-i} - \log y_{j,t-i}^P) - \sum_{i=1}^{3}\frac{\lambda_{j,6+i}}{\lambda_{j6}}Z_{j,t-i} - \frac{\epsilon_{j7}}{\lambda_{j6}}$$

	UK	CA	FR	GE	IT	JA	NE
Coefficients							
$-\lambda_{j1}/\lambda_{j6}$	−.7098	.3108	4.0912	−2.8389	−10.5063	.4408	−.5967
	(1.0135)	(.0990)	(2.5134)	(3.2782)	(11.0556)	(2.4054)	(1.0728)
	−.700	3.141	1.628	−.866	−.950	.183	−.556
$1/\lambda_{j6}$	1.9019	1.3247	4.3304	2.2772	1.6392	11.5779	1.3619
	(.3771)	(.5007)	(1.2205)	(2.2405)	(1.4812)	(3.9031)	(.5171)
	5.044	2.645	3.548	1.016	1.107	2.966	2.634
$-\lambda_{j2}/\lambda_{j6}$	−.1897	−.4200	−.4294	−1.7447	−.8465	−1.5938	−.2921
	(.6476)	(.5098)	(1.1609)	(1.7221)	(.9947)	(5.2844)	(.4519)
	−.293	−.824	−.370	−1.013	−.851	−.302	−.646
$-\lambda_{j3}/\lambda_{j6}$	.0489	−.1201	−.7055	.4096	.9383	−.0654	.0047
	(.2656)	(.0349)	(.3942)	(.5436)	(1.0244)	(.2069)	(.1917)
	.184	−3.439	−1.790	.753	.916	−.316	.024
$-\lambda_{j4}/\lambda_{j6}$	−.1153	−.0508	.1843	.6405	1.0612	−.5164	1.2541
	(.4699)	(.2953)	(1.0028)	(1.2641)	(1.2402)	(1.0151)	(1.1212)
	−.245	−.172	.184	.507	.856	−.509	1.119

Table 6.12 (continued)

	UK	CA	FR	GE	IT	JA	NE
$-\lambda_{j5}/\lambda_{j6}$	−.3631	−.3419	.1800	−.0096	.5556	−.3701	−1.1448
	(.2864)	(.2542)	(.5645)	(.8593)	(1.2274)	(.8033)	(.7698)
	−1.268	−1.345	.319	−.011	.453	−.382	−1.487
$-\lambda_{j7}/\lambda_{j6}$	.6335	.8510	.1853	.8729	.6988	.4583	.6319
	(.2782)	(.1563)	(.1723)	(.3690)	(.2831)	(.3703)	(.3738)
	2.277	5.445	1.075	2.365	2.469	1.238	1.691
$-\lambda_{j8}/\lambda_{j6}$	−.2346	−.1488	.1247	−.2489	−.0300	−.1189	−.0552
	(.2588)	(.1810)	(.2363)	(.3266)	(.3213)	(.3002)	(.3680)
	−.906	−.822	.528	−.762	−.093	−.396	−.150
$-\lambda_{j9}/\lambda_{j6}$	.0585	−.0821	.2125	.1413	.1455	−.0560	.0680
	(.1555)	(.1252)	(.2145)	(.3371)	(2968)	(.2319)	(.3114)
	.376	−.656	.991	.419	.490	.242	.219
$\bar{R}^2$	.9865	.9353	.9570	.8534	.9475	.9718	.8818
S.E.E.	.0188	.0184	.0225	.0349	.0543	.0303	.0297
h [D-W][†]	[1.50]	[2.20]	3.25	[2.14]	[2.56]	[2.29]	[2.99]

Note. These regressions are for the floating periods listed in part *a* of table 5.6. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

[†] The biased Durbin-Watson statistic is reported in square brackets in those cases in which Durbin's *h* cannot be computed (is imaginary).

Table 6.13 **Import Price Equations** (R8) **and** (N8P)[†]

$\log P_j^I = \log P_{j,t-1}^I + \mu_{j1} + \mu_{j2}\Delta \log P_{j,t-1}^I + \mu_{j3}\Delta \log P^{RO} + \mu_{j4}\Delta \log y_j^R + \mu_{j5}\Delta(I/Y)_j + \mu_{j6}\Delta \log P_j^R + [\mu_{j7}\Delta \log E_j]^{\S} + \epsilon_{j8}$

	US	UK	CA	FR	GE	IT	JA	NE
Coefficients								
μ_{j1}	−.0017	−.0151	−.0030	−.0070	−.0107	−.0069	−.0193	−.0012
	(.0038)	(.0076)	(.0083)	(.0105)	(.0045)	(.0088)	(.0057)	(.0057)
	−.446	−1.993	−.357	−.673	−2.380	−.786	−3.392	−.208
μ_{j2}	−.6420	−.0020	−.0538	−.0994	.2422	.0728	.1248	.2289
	(.0850)	(.1319)	(.2077)	(.1115)	(.1150)	(.1588)	(.1422)	(.1196)
	7.557	−.015	−.259	−.891	2.107	.458	.877	1.914
μ_{j3}	.0717	−.0403	−.2454	.0522	.0070	.1656	−.0717	.0999
	(.0160)	(.0901)	(.5708)	(.1115)	(.0613)	(.1008)	(.0655)	(.0644)
	4.483	−.448	−.430	.468	.113	1.644	−1.095	1.550
μ_{j4}	.1522	.6483	.2795	−.0267	.2902	−.1488	.8201	−.2553
	(.2428)	(.4400)	(.4498)	(.5936)	(.2723)	(.4512)	(.3479)	(.3150)
	.627	1.473	.621	−.045	1.066	−.330	2.358	−.810

Table 6.13 (continued)

	US	UK	CA	FR	GE	IT	JA	NE
μ_{j5}	1.9255	.1900	.7223	1.9406	−.3779	−.2210	3.0762	.1692
	(.9474)	(.3909)	(.3940)	(1.0139)	(.3335)	(.4550)	(1.2324)	(.1091)
	2.032	.486	1.833	1.914	−1.133	−.497	2.496	1.550
μ_{j6}	.1424	1.3714	.2029	1.2349	1.2003	1.2481	1.3652	.8842
	(.1420)	(.5919)	(.8294)	(.7141)	(.3822)	(.7171)	(.4252)	(.4491)
	1.003	2.317	.245	1.729	3.140	1.741	3.211	1.969
μ_{j7}	—	.5061	.0214	.6364	.4684	−1.1264	.6959	.8225
		(.1568)	(.5412)	(.1086)	(.1312)	(1.3049)	(.6067)	(.2579)
		3.229	.040	5.861	3.570	−.863	1.147	3.189
$\bar{R}^2$	.9964	.9734	.9347	.9468	.9108	.9194	.9410	.9135
S.E.E.	.0129	.0159	.0084	.0197	.0106	.0170	.0117	.0110
h [D-W]‡	−4.48	−23.57	[1.86]	−1.05	−.22	[2.13]	[2.10]	.59

Note. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

†For the nonreserve countries, these regressions are estimated over only the pegged portion of 1957I–76IV (excludes floating periods listed in part *a* of table 5.6).

§The exchange-rate term does not appear in the U.S. equation (R8).

‡The biased Durbin-Watson statistic is reported in square brackets in those cases in which Durbin's *h* cannot be computed (is imaginary).

Table 6.14 **Exchange-Rate Equations** (N8F)

$$\log E_j = \log E_{j,t-1} - \frac{\mu_{j1}}{\mu_{j7}} + \frac{1}{\mu_{j7}} \Delta \log P_j^I - \frac{\mu_{j2}}{\mu_{j7}} \Delta \log P_{j,t-1}^I - \frac{\mu_{j3}}{\mu_{j7}} \Delta \log P^{RO} - \frac{\mu_{j4}}{\mu_{j7}} \Delta \log y_j^R - \frac{\mu_{j5}}{\mu_{j7}} \Delta (I/Y)_j - \frac{\mu_{j6}}{\mu_{j7}} \Delta \log P_j^R - \frac{\epsilon_{j8}}{\mu_{j7}}$$

	UK	CA	FR	GE	IT	JA	NE
Coefficients							
$-\mu_{j1}/\mu_{j7}$	.0490	$-$.0040	.0507	.0174	.0283	.0508	.0162
	(.0368)	(.0055)	(.0257)	(.0363)	(.0402)	(.0212)	(.0202)
	1.333	$-$.727	1.976	.480	.704	2.393	.803
$1/\mu_{j7}$	.3454	.2732	$-$.0635	.3949	.8467	.1140	.3805
	(.8276)	(.2211)	(.5233)	(.5426)	(.4179)	(.2468)	(.4575)
	.417	1.236	$-$.121	.728	2.026	.462	.832
$-\mu_{j2}/\mu_{j7}$	.2291	.0273	.2030	$-$.6752	$-$.2330	$-$.2069	$-$.2598
	(.4163)	(.1829)	(.2485)	(.3770)	(.2445)	(.1554)	(.2703)
	.550	.149	.817	$-$1.791	$-$.953	$-$1.331	$-$.961
$-\mu_{j3}/\mu_{j7}$	$-$.0018	$-$.0202	.0518	$-$.0775	$-$.0045	$-$.0078	.0367
	(.0582)	(.0144)	(.0493)	(.0651)	(.0732)	(.0332)	(.0406)
	$-$.032	$-$1.401	1.050	$-$1.190	$-$.061	$-$.236	.903

Table 6.14 (continued)

	UK	CA	FR	GE	IT	JA	NE
$-\mu_{j4}/\mu_{j7}$	.9776	.2732	−.9932	−1.4449	.5851	−2.8944	−.2758
	(1.3640)	(.3320)	(1.2940)	(1.3021)	(1.4865)	(.8975)	(.6667)
	.717	.823	−.768	−1.110	.394	−3.225	−.414
$-\mu_{j5}/\mu_{j7}$	−1.3030	−.3851	1.7303	4.7085	−2.2140	7.0538	−.5083
	(1.3132)	(.4451)	(2.1846)	(3.6567)	(1.8783)	(4.9008)	(.4632)
	−.992	−.865	.792	1.288	−1.179	1.439	−1.097
$-\mu_{j6}/\mu_{j7}$	−2.8498	−.0676	−2.9759	−1.4430	−1.8682	−1.9986	−1.6610
	(.9892)	(.2367)	(.8646)	(1.4249)	(1.4868)	(.6666)	(.6668)
	−2.881	−.286	−3.442	−1.013	−1.256	−2.998	−2.491
$\bar{R}^2$	.1213	.0007	.6551	.1563	−.6624	.3304	.5852
S.E.E.	.0443	.0135	.0291	.0493	.0590	.0283	.0275
D-W	2.76	1.38	2.45	2.40	3.12	2.04	1.94

Note. These regressions are for the floating periods listed in part *a* of table 5.6. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

Table 6.15 **Capital-Flows Equations** (R9) **and** (N9)

$$(C/Y)_j = \xi_{j1} + \xi_{j2}t + \xi_{j3}\log P^{RO} + \xi_{j4}R_j + [\xi_{j5}(4\Delta \log E_{j,t+1})^* + \xi_{j6}R_1]^\dagger + \xi_{j7}[(X/Y)_j - (I/Y)_j] + \xi_{j8}(\log y_j - \log y_j^P)$$
$$+ \xi_{j9}\Delta \log y_j + \xi_{j10}\Delta \log y_j^R + \sum_{i=0}^{2} \xi_{j,11+i}\Delta R_{j,t-i} + \left[\sum_{i=0}^{2} \xi_{j,14+i}\Delta R_{1,t-i} + \sum_{i=0}^{2} \xi_{j,17+i}\Delta(4\Delta \log E_{j,t+1-i})^*\right]^\dagger + \epsilon_{j9}$$

	US	UK	CA	FR	GE	IT	JA	NE
Coefficients								
ξ_{j1}	.0077	.0198	−.0211	−.0159	.0008	.0249	.1931	.0009
	(.0053)	(.0206)	(.0128)	(.0114)	(.0227)	(.0237)	(.1136)	(.0149)
	1.455	.965	−1.642	−1.396	.034	1.052	1.700	.060
ξ_{j2}	.0004	−.0003	−.0001	−.0001	−.0000	.0002	−.0005	.0004
	(.0001)	(.0004)	(.0002)	(.0002)	(.0004)	(.0002)	(.0005)	(.0002)
	3.142	−.716	−.474	−.472	−.010	.641	−1.134	1.747
ξ_{j3}	−.0013	−.0760	.0075	.0134	.0044	.0002	.0134	.0162
	(.0082)	(.0269)	(.0090)	(.0124)	(.0123)	(.0098)	(.0301)	(.0099)
	−.164	−2.820	.480	1.085	.358	.019	1.042	1.638
ξ_{j4}	−.1007	.7525	−.2095	−.6406	−.3022	−.6437	−2.4553	−.5028
	(.1849)	(.5526)	(.2558)	(.2298)	(.3641)	(.3542)	(1.3871)	(.3246)
	−.545	1.362	−.819	−2.788	−.830	−1.817	−1.770	−1.549
ξ_{j5}	.0348	.4443	.3993	.1171	.0971	.1421	.0645	.2198
	(.0534)	(.1535)	(.2398)	(.0493)	(.1478)	(.1020)	(.0876)	(.1079)
	.651	2.895	1.665	2.373	.657	1.393	.736	2.036

Table 6.15 (continued)

	US	UK	CA	FR	GE	IT	JA	NE
ξ_{j6}	−.2098	−.9278	.5253	1.0231	.2431	.1986	.3620	−.0984
	(.1402)	(.6580)	(.3505)	(.3579)	(.6019)	(.3294)	(.3415)	(.4612)
	−1.496	−1.410	1.499	2.859	.404	.603	1.060	−.213
ξ_{j7}	.7666	−.8730	.7222	.7770	.5354	.5817	−.2125	.7699
	(.2568)	(.4839)	(.2698)	(.3074)	(.5225)	(.1277)	(.6198)	(.1968)
	2.986	−1.804	2.677	2.528	1.025	4.556	−.343	3.911
ξ_{j8}	−.0535	−.4390	.1017	.0609	−.0654	−.0065	.0441	.2249
	(.0681)	(.3257)	(.1219)	(.1693)	(.1639)	(.1297)	(.1487)	(.1612)
	−.786	−1.348	.835	.360	−.399	−.050	.296	1.395
ξ_{j9}	−.1069	.4491	−.4494	−.2608	.3244	−.1259	−.3308	−.0454
	(.1890)	(.3905)	(.2863)	(.2020)	(.4095)	(.1908)	(.1824)	(.3549)
	−.566	1.150	−1.570	−1.291	.792	−.660	−1.814	−.128
$\xi_{j,10}$	.0550	.0804	.8661	.5558	−1.0229	−.2624	.0348	−.4544
	(.1612)	(.8828)	(.4604)	(.4806)	(.7941)	(.5041)	(.4485)	(.7418)
	.341	.091	1.881	1.156	−1.288	−.521	.078	−.612
$\xi_{j,11}$	−.2997	.7571	−.5176	.6364	.0952	1.3828	−.6103	.6962
	(.4298)	(.6444)	(.4238)	(.3094)	(.5455)	(.9374)	(3.1056)	(.4190)
	−.697	1.175	−1.221	2.057	.714	1.475	−.197	1.661
$\xi_{j,12}$	.3474	−.8290	−.2984	.2588	−.4225	.4430	−1.1426	−.6873
	(.2492)	(.5917)	(.3544)	(.2594)	(.3424)	(.6100)	(2.3290)	(.3728)
	1.394	−1.401	−.842	.998	−1.234	.726	−.491	−1.844
$\xi_{j,13}$	−.6649	−.8227	.1658	.9085	.4053	.3617	−.3466	.3636
	(.3729)	(.5648)	(.3765)	(.2729)	(.4166)	(.6552)	(2.0206)	(.4770)
	−1.783	−1.457	.440	3.330	.973	.552	−.172	.762

$\xi_{j,14}$	.0076	.3171	.1848	−.6548	1.6290	−.1722	−.8260	.9836
	(.1695)	(1.3718)	(.5837)	(.7819)	(.9686)	(.5950)	(.6718)	(.7686)
	.045	.231	.317	−.837	1.682	−.289	−1.230	1.280
$\xi_{j,15}$	.0345	−.5770	.2139	−.9947	.1326	−.3523	−.0918	.1718
	(.1314)	(.9802)	(.4590)	(.4586)	(.7422)	(.4126)	(.3850)	(.5909)
	.262	−.589	.466	−2.169	.179	−.854	−.238	.291
$\xi_{j,16}$	.2389	.9616	−.1944	.3867	.5469	−.0210	−.2326	.9798
	(.1300)	(1.0101)	(.4392)	(.4544)	(.6142)	(.3988)	(.4311)	(.6156)
	1.838	.952	−.443	.851	.891	−.053	−.540	1.592
$\xi_{j,17}$	.0033	−.3424	−.3006	−.0023	.0029	−.0451	.0383	−.0866
	(.0404)	(.1224)	(.2497)	(.0589)	(.1142)	(.0698)	(.0808)	(.0867)
	.082	−2.797	−1.204	−.038	.025	−.646	.474	−.999
$\xi_{j,18}$	−.0040	−.0765	−.0482	.0007	.0469	.0380	.0331	−.0515
	(.0119)	(.0607)	(.0860)	(.0231)	(.0448)	(.0414)	(.0516)	(.0370)
	−.332	−1.261	−.561	.029	1.049	.917	.640	−1.392
$\xi_{j,19}$	.0019	−.0117	−.0687	−.0173	.0516	.0711	.0236	.0468
	(.0116)	(.0542)	(.0880)	(.0217)	(.0455)	(.0379)	(.0487)	(.0349)
	.167	.215	−.781	−.798	1.134	1.875	.485	1.341
$\bar{R}^2$	.1968	−.0965	.2811	.1908	.1568	.3486	−.1952	.4587
S.E.E.	.0072	.0291	.0133	−.0419	.0228	.0137	.0135	.0189
D-W	1.87	1.98	1.69	1.72	2.30	1.20	1.65	1.84

Note. Period: 1957I–76IV. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

[†] For the U.S. equation only, for "(4Δ log E_j . . ." read "−(4Δ log E_2 . . ." and for "R_1" read "R_2" (see equation (R9)).

Table 6.16 **Balance-of-Payments Equations** (N10F)
$(B/Y)_j = \psi_{j1} + \psi_{j2}(B/Y)_{j,t-1} + \psi_{j3}\Delta \log E_j + \psi_{j4}\Delta \log E_{j,t-1} + \psi_{j5}(\Delta \log P_{j,t-1} - \Delta \log P_{1,t-1}) + \epsilon_{j,10}$

Country	ψ_{j1}	ψ_{j2}	ψ_{j3}	ψ_{j4}	ψ_{j5}	$\bar{R}^2$	S.E.E.	h [D-W][†]
UK	0.0002	0.4170	0.0191	−0.0346	−0.1007	0.1710	0.0074	0.05
	(0.0023)	(0.1889)	(0.0518)	(0.0371)	(0.0896)			
	0.095	2.208	0.368	−0.931	−1.125			
CA	0.0003	0.2975	−0.0927	0.0403	−0.0109	0.0943	0.0018	[1.89]
	(0.0003)	(0.1704)	(0.0328)	(0.0223)	(0.0147)			
	1.005	1.746	−2.824	1.802	−0.738			
FR	0.0004	0.1640	−0.0304	0.0124	0.0332	−0.1965	0.0047	[1.82]
	(0.0015)	(0.2494)	(0.0333)	(0.0220)	(0.2015)			
	0.241	0.658	−0.912	0.564	0.165			
GE	0.0052	−0.0723	−0.1020	0.0025	0.0766	0.0606	0.0053	[1.98]
	(0.0021)	(0.2621)	(0.0332)	(0.0267)	(0.1649)			
	2.471	−0.276	−3.073	0.094	0.464			
IT	−0.0022	0.1758	−0.0465	−0.0232	0.0411	0.1731	0.0046	[1.51]
	(0.0016)	(0.2351)	(0.0247)	(0.0268)	(0.0922)			
	−1.412	0.748	−1.884	−0.865	0.446			
JA	0.0007	0.7929	0.0397	0.0244	−0.0193	0.4109	0.0038	1.01
	(0.0010)	(0.2136)	(0.0392)	(0.0276)	(0.0633)			
	0.652	3.712	1.014	0.883	−0.305			
NE	0.0021	−0.2072	−0.0078	−0.0295	0.0196	−0.1179	0.0063	[2.09]
	(0.0019)	(0.2557)	(0.0529)	(0.0333)	(0.1303)			
	1.144	−0.810	−0.147	−0.885	0.150			

Note. These regressions are for the floating periods listed in part *a* of table 5.6. Standard errors are in parentheses below coefficient estimates; *t* statistics are below the standard errors.

[†] The biased Durbin-Watson statistic is reported in square brackets in those cases in which Durbin's *h* cannot be computed (is imaginary).

Table 6.17 **Significant Cross-Correlation Coefficients for Residuals within Countries and with U.S. Money, Income, and Prices: 0.05 Level or Better**

Pegged Period: 1957II–71I (1962IV–70I Canada)

Country	Significant Correlations within Country	Significant Correlations with U.S. Variables
US	$\rho(\log P_1, R_1) = -0.348^*$ $\rho(\log P_1, (X/Y)_1) = -0.310$ $\rho(\log P_1, (C/Y)_1) = 0.327$ $\rho(\log y_1, (I/Y)_1) = -0.490^*$ $\rho(\log y_1, (C/Y)_1) = 0.358^*$ $\rho(u_1, R_1) = -0.275$ $\rho(\log P_1^f, (X/Y)_1) = -0.286$	N.A.
UK	$\rho(\log P_2, \log P_2^f) = -0.325$ $\rho(\log P_2, (I/Y)_2) = -0.274$ $\rho(\log y_2, u_2) = 0.272$ $\rho(\log y_2, \log M_2) = 0.274$ $\rho(u_2, (X/Y)_2) = 0.279$ $\rho((I/Y)_2, (C/Y)_2) = -0.336$	$\rho(\log y_2, \log P_1) = -0.350^*$ $\rho(\log M_2, \log M_1) = 0.327$ $\rho(\log P_2^f, \log y_1) = -0.314$ $\rho((X/Y)_2, \log y_1) = 0.372^*$
CA	$\rho(\log P_3, \log M_3) = 0.521^*$ $\rho(\log y_3, (X/Y)_3) = -0.396$ $\rho(\log y_3, (C/Y)_3) = 0.427$ $\rho(\log M_3, R_3) = -0.473^*$ $\rho(\log M_3, (C/Y)_3) = -0.366$	None
FR	$\rho(\log P_4, R_4) = -0.320$ $\rho(\log y_4, u_4) = 0.500^*$ $\rho(\log y_4, P_4^f) = -0.311$ $\rho(\log y_4, (X/Y)_4) = 0.307$ $\rho(\log M_4, R_4) = 0.349^*$ $\rho(\log P_4^f, (I/Y)_4) = -0.367^*$ $\rho(\log P_4^f, (C/Y)_4) = -0.334$	$\rho(R_4, \log M_1) = 0.272$

Table 6.17 (continued)

Country	Significant Correlations within Country	Significant Correlations with U.S. Variables
GE	None	None
IT	$\rho(\log M_6, (C/Y)_6) = -0.599^*$ $\rho(R_6, (I/Y)_6) = 0.393^*$ $\rho(I/Y)_6, (X/Y)_6) = 0.380^*$	$\rho((I/Y)_6, \log y_1) = 0.300$
JA	$\rho(\log M_7, \log P_7^I) = 0.299$ $\rho(R_7, (I/Y)_7) = -0.455^*$	
NE	$\rho(\log M_8, (I/Y)_8) = -0.521^*$ $\rho(R_8, (X/Y)_8) = -0.348^*$	$\rho(\log P_8, \log M_1) = 0.303$ $\rho(\log y_8, \log P_1) = -0.278$ $\rho(\log P_8^I, \log P_1) = -0.402^*$

Notes. Correlations marked with an asterisk are significant at the 0.01 level or better. The critical values for the correlation coefficients are ±0.265 (±0.361 for Canada) at the 0.05 level and ±0.342 (±0.463 for Canada) at the 0.01 level.

For each country, correlation coefficients were computed for all possible combinations of the residuals to all the equations (R1) through (R9) or (N1) through (N9) for the pegged period. In addition for the nonreserve countries, correlation coefficients were computed for the residuals of the U.S. equations (R1), (R2), and (R4) (i.e. the $\log y_1$, $\log P_1$, and $\Delta \log M_1$ equations) with the residuals of each of the equations (N1) through (N9). Since equation (N3) is estimated only in the cases of the United Kingdom and France, the total number of correlation coefficients examined varies by country as follows:

Country	Domestic ρ	International ρ
United States	36	0
U.K., France	36 each	27 each
Other 5 countries	28 each	24 each
TOTAL ALL COUNTRIES	248	174

The following correlation pairs were significant for more than one country:

($\log P_j, R_j$): United States*, France
($\log y_j$, $(C/Y)_j$): United States*, Canada
($\log y_j, u_j$): United Kingdom, France
($\log y_j$, $(X/Y)_j$): Canada, France
($\log M_j, R_j$): Canada, France*
(R_j, $(I/Y)_j$): Italy*, Japan
($\log y_j, \log P_1$): United Kingdom*, Netherlands

Table 6.18 **Significant Cross-Correlation Coefficients for Residuals within Countries and with U.S. Money, Income, and Prices: 0.05 Level or Better**

Floating Period: 1971III–76III

Country	Significant Correlations within Country	Significant Correlations with U.S. Variables
US	$\rho(\log P_1, R_1) = -0.452$ $\rho(R_1, (I/Y)_1) = -0.482$	N.A.
UK	$\rho(\log P_2, u_2) = 0.488$ $\rho(\log M_2, (C/Y)_2) = 0.489$ $\rho(\log M_2, (B/Y)_2) = -0.536$ $\rho(R_2, \log Z_2) = -0.505$	None
CA	$\rho(\log P_3, \log y_3) = -0.513$ $\rho(\log P_3, \log Z_3) = -0.677^*$ $\rho(\log Z_3, (C/Y)_3) = 0.443$	$\rho(\log Z_3, \log y_1) = -0.553^*$
FR	$\rho(\log P_4, \log M_4) = -0.621^*$ $\rho(\log P_4, R_4) = -0.557^*$ $\rho(\log Y_4, u_4) = -0.434$ $\rho(\log E_4, (B/Y)_4) = 0.469$	$\rho(u_4, \log M_1) = 0.466$
GE	$\rho(\log E_5, (X/Y)_5) = -0.535$ $\rho(\log Z_5, (C/Y)_5) = 0.532$	$\rho((B/Y)_5, \log y_1) = 0.660^*$
IT	$\rho(\log E_6, \log Z_6) = -0.573^*$ $\rho(\log E_6, (B/Y)_6) = 0.485$	None
JA	$\rho(\log y_7, R_7) = -0.659^*$ $\rho(\log y_7, (X/Y)_7) = 0.486$ $\rho(R_7, \log E_7) = -0.587^*$ $\rho(R_7, \log Z_7) = 0.455$ $\rho((C/Y)_7, (B/Y)_7) = -0.710^*$	$\rho((B/Y)_7, \log P_1) = -0.459$

Table 6.18 (continued)

Country	Significant Correlations within Country	Significant Correlations with U.S. Variables
NE	$\rho(\log y_8, (C/Y)_8) = -0.575^*$ $\rho(\log M_8, R_8) = 0.467$ $\rho(R_8, (B/Y)_8) = -0.512$ $\rho((C/Y)_8, (B/Y)_8) = -0.588^*$	$\rho(R_8, \log M_1) = -0.563^*$

Notes. Correlations marked with an asterisk are significant at the 0.01 level (exceed 0.549 in absolute value). The critical values at the 0.05 level are ±0.433.

For each country, correlation coefficients were computed for all possible combinations of the residuals to all the equations (R1) through (R9) and (N1) through (N10F) for the floating period. In addition for the nonreserve countries, correlation coefficients were computed for the residuals of the U.S. equations (R1), (R2), and (R4) (i.e. the $\log y_1$, $\log P_1$, and $\Delta \log M_1$ equations) with the residuals of each of the equations (N1) through (N10F). Since equation (N3) is estimated only in the cases of the United Kingdom and France, the total number of correlation coefficients examined varies by country as follows:

Country	Domestic ρ	International ρ
United States	36	0
U.K., France	45 each	30 each
Other 5 countries	36 each	27 each
TOTAL ALL COUNTRIES	306	195

The following correlation pairs were significant for more than one country:

$(\log P_j, R_j)$: United States, France*
$(R_j, \log Z_j)$: United Kingdom, Japan
$(\log Z_j, (C/Y)_j)$: Canada, Germany
$(\log E_j, (B/Y)_j)$: France, Italy
$((C/Y)_j, (B/Y)_j)$: Japan,* Netherlands*

Table 6.19 **Frequency of Significant Cross-Correlation Coefficients for Residuals by Type and Period**

	Within Country	With U.S. Variables
	5% Level or Better	
Pegged period	12.9%	5.2%
Floating period	8.5%	2.6%
	1% Level or Better	
Pegged period	5.6%	1.7%
Floating period	2.9%	1.5%

Table 6.20 Data Sources for the Mark III Model

$(B/Y)_j$	Numerators $[B_j]$	
	USBPQSDR	Nominal balance of payments, official reserve settlement basis, SA,QR
	UKBPQSCF	Nominal balance of payments, official reserve settlement basis, SA,QR
	CABPQSCC	Quarterly change in nominal official reserves, SA,QR
	FRBPQSFF	Quarterly change in nominal net official reserves, SA,QR
	GEBPQSDR	Nominal balance of payments, official reserve settlement basis, SA,QR
	ITBPQSVL	Quarterly change in nominal official reserves, SA,QR
	JABPQSJJ	Quarterly change in nominal official reserves, SA,QR
	NEBPQSSB	Nominal balance of payments, official reserve settlement basis, SA,QR
	Denominators $[Y_j]$	
	USYNQSGN	Nominal gross national product, SA, AR
	UKYNQSGD	Nominal gross domestic product, SA,AR
	CAYNQSCA	Nominal gross national product, SA,AR
	FRYNQSFF	Nominal *produit intérieur brut* (PIB),SA,AR
	GEYNQSGN	Nominal gross national product, SA,AR
	ITYNQSGD	Nominal gross domestic product, SA,AR
	JAYNQSJJ	Nominal gross national product, SA,AR
	NEYNQSNP	Nominal gross national product, SA,AR
$(C/Y)_j$	Calculated as: $(C/Y)_j \equiv (X/Y)_j - (I/Y)_j - 4(B/Y)_j$. Note that $(C/Y)_j$, $(X/Y)_j$, and $(I/Y)_j$ are at annual rates; $(B/Y)_j$ is at quarterly rates.	
DF_j	Floating dummy; is 1 except in the following (pegged) quarters, when it is 0:	
	UK 1955I–71II	IT 1955I–71II
	CA 1962III–70I	JA 1955I–71II
	FR 1955I–71II	NE 1955I–71I
	GE 1955I–71I	
E_j	US ≡ 1	
	UKXRQNLB	Spot exchange rate (London exchange), QAEM
	CAXRQNSP	Exchange rate (Canadian interbank), QAD
	FRXRQNFF	Spot exchange rate (IMF), QAD
	GEXRQNDM	Spot exchange rate (Frankfurt exchange), LMAD
	ITXRQNLR	Spot exchange rate (Rome and Milan exchanges), QAD
	JAXRQNSP	Exchange rate (interbank), QAEM
	NEXRQNGL	Spot exchange rate (Amsterdam exchange), QAW
g_j	G_j/P_j, where P_j is defined below and G_j is:	
	USGXQSFD	Nominal federal government expenditure, SA,AR
	UKGXQSCG	Nominal central government expenditure, SA,AR
	CAGXQSEX	Nominal federal government expenditure, SA,AR
	FRGXQSFF	Nominal central government expenditure, SA,AR

Table 6.20 (continued)

	GEGXQSFG	Nominal federal government expenditure, SA,AR
	ITGXQSFD	Nominal federal government expenditure, SA,AR
	JAGXQSEX	Nominal treasury payments (QAM),SA,AR
	NEGXQSFD	Nominal central government payments, SA,AR

$\hat{g}_j$ Residuals from ARIMA (p, d, q) processes fitted to log g_j. The (p, d, q) values of the fitted processes are:[†]

US	(0,1,0)	GE	(0,1,1)
UK	(2,1,0)	IT	(0,1,1)
CA	(0,1,1)	JA	(0,1,6) $[\theta_2 = \theta_4 = \theta_5 = 0]$
FR	(0,1,1)	NE	(0,1,4) $[\theta_2 = \theta_3 = 0]$

$(I/Y)_j$ Numerators $[I_j]$:

USIMQSTL	Nominal total imports, SA,AR
UKIMQSCA	Nominal total imports, SA,AR
CAIMQSTL	Nominal total imports, SA,AR
FRIMQSFF	Nominal merchandise imports, SA,AR
GEIMQSTL	Nominal total imports, SA,AR
ITIMQSTL	Nominal total imports, SA,AR
JAIMQSJJ	Nominal merchandise imports (customs basis), SA,AR
NEIMQSTL	Nominal total imports, SA,AR

Denominators $[Y_j]$ as defined at $(B/Y)_j$ above.

M_j	USM1QSAE	Nominal narrow money stock, SA,QAD
	UKM1QSDR	Nominal narrow money stock, SA,QAM
	CAM1QSCC	Nominal narrow money stock, SA,QAW
	FRM2QSFF	Nominal broader money stock, SA,QAM
	GEM2QSDR	Nominal broader money stock, SA,EQ
	ITM1QSDR	Nominal narrow money stock, centered on EQ
	JAM1QSJJ	Nominal narrow money stock, SA,QAM
	NEM2QSDR	Nominal broader money stock, SA, EQ

$\hat{M}_j$ Residuals from ARIMA (p, d, q) processes fitted to log M_j. The (p, d, q) values of the fitted processes are:[†]

US	(1,2,2) $[\theta_1 = 0]$
UK	(2,1,0)
CA	(2,2,4) $[\theta_1 = \theta_2 = 0]$
FR	(1,1,6) $[\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = 0]$
GE	(0,1,3)
IT	(1,1,3) $[\theta_1 = 0]$
JA	(2,1,4) $[\theta_1 = \theta_2 = \theta_3 = 0]$
NE	(2,1,4) $[\theta_1 = \theta_2 = \theta_3 = 0]$

P_j	USPDQSN0	GNP implicit price deflator (1970 = 1.00), SA
	UKPDQSD7	GDP implicit price deflator (1970 = 1.00), SA
	CAPDQS70	GNP implicit price deflator (1970 = 1.00), SA
	FRPDQS70	PIB implicit price deflator (1970 = 1.00), SA
	GEPDQSN7	GNP implicit price deflator (1970 = 1.00), SA
	ITPDQS70	GDP implicit price deflator (1970 = 1.00), SA
	JAPDQSJJ	GNP implicit price deflator (1970 = 1.00), SA
	NEPDQSN7	GNP implicit price deflator (1970 = 1.00), SA

Table 6.20 (continued)

P_j^I	USPIQS70/100	Index of unit value of imports (1970 = 100, IFS series 75), SA
	UKPIQS70/100	Index of total imports unit value (1970 = 100, IFS series 75), SA
	CAPIQS70/100	Index of import prices (1970 = 100, IFS series 75), SA
	FRPIQS70/100	Index of import prices (1970 = 100, IFS series 75), SA
	GEPIQS70/100	Index of purchase prices of foreign goods (1970 = 100, IFS series 75.x), SA
	ITPIQS70/100	index of import prices (1970 = 100, IFS series 75), SA
	JAPIQS70/100	Index of contract prices of importers (1970 = 100, IFS series 75.x), SA
	NEPIQS70/100	Index of unit value of imports (1970 = 100, IFS series 75), SA
P_j^R	See identities (R19) and (N19) and table 5.7.	
P^{RO}	Computed as VPOIL/(100 · P_1), where VPIOL is the dollar price index of Venezuelan crude oil (1970 = 100) described in table 6.21.	
R_j	USRSQN3T	Three-month treasury bill yield, QAD
	UKRSQN3T	Three-month treasury bill yield, QAEM
	CARSQNTB	Three-month treasury bill yield, QAEM
	FRRSQNST	Short-term money market rate on private bills, QAD
	GERSQN3M	Three-month money market rate, pre-1967 LMAW, post-1966 LMAD
	ITRLQNGU	Market yield on long-term corporate bonds, QAM
	JARSQNLD	Average contracted interest rate on bank loans, QAW
	NERSQN3T	Three-month treasury paper yield to maturity, QAD
t	Time index (1955I = 1, 1955II = 2, etc.)	
u_j	USURQSCV	Unemployment rate, SA,QAM
	UKURQSDR	Unemployment rate, SA,QAM
	FRURQSFF	Unemployment rate, SA,EQ
	For experiments discussed in text (these do not appear in the model):	
	CAURQS14	Unemployment rate, SA
	GEURQSDR	Unemployment rate, SA
	ITURQSDR	Unemployment rate, SA
	JAURQSUR	Unemployment rate, SA,QAM
	NEURQSSE	Unemployment rate, SA
$(X/Y)_j$	Numerators $[X_j]$:	
	USEXQSTL	Nominal total exports, SA,AR
	UKEXQSCA	Nominal total exports, SA,AR
	CAEXQSTL	Nominal total exports, SA,AR
	FREXQSFF	Nominal merchandise exports, SA,AR
	GEEXQSTL	Nominal total exports, SA,AR
	ITEXQSTL	Nominal total exports, SA,AR
	JAEXQSJJ	Nominal merchandise exports (customs basis), SA,AR
	NEEXQSTL	Nominal total exports, SA,AR
	Denominators $[Y_j]$ as defined at $(B/Y)_j$ above.	

Table 6.20 (continued)

$\hat{x}_j$ Residuals from ARIMA (p, d, q) processes fitted to $(X/Y)_j$. The (p, d, q) values of the fitted processes are:[†]

US	$(0,1,3)\ [\theta_1 = 0]$
UK	$(0,1,7)\ [\theta_1 = \theta_3 = \theta_5 = \theta_6 = 0]$
CA	$(1,1,8)\ [\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = \theta_7 = 0]$
FR	$(1,1,4)\ [\theta_1 = \theta_3 = 0]$
GE	$(0,1,4)\ [\theta_1 = \theta_2 = \theta_3 = 0]$
IT	$(2,1,11)\ [\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = \theta_7 = \theta_9 = \theta_{10} = 0]$
JA	$(2,2,9)\ [\theta_1 = \theta_2 = \theta_3 = \theta_5 = \theta_6 = \theta_7 = \theta_8 = 0]$
NE	$(0,1,9)\ [\theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = \theta_7 = \theta_8 = 0]$

y_j

USYRQSN0	Real gross national product, SA,AR
UKYRQSD7	Real gross domestic product, SA,AR
CAYRQS70	Real gross national product, SA,AR
FRYRQS70	Real *produit intérieur brut*, SA,AR
GEYRQSN7	Real gross national product, SA,AR
ITYRQSD7	Real gross domestic product, SA,AR
JAYRQS70	Real gross national product, SA,AR
NEYRQSN7	Real gross national product, SA,AR

y_j^P See identities (R11) and (N11). All $\phi_{j2} \equiv 0.025$; other parameters are:

Country	$\phi_{j3} \equiv \phi_{j1}/0.975$	$\log y^P_{j,[1954IV]}$
US	0.00866	6.34717
UK	0.00670	3.34166
CA	0.01200	3.70432
FR	0.01379	5.68231
GE	0.01143	5.76526
IT	0.01218	10.15820
JA	0.02280	9.65613
NE	0.01161	3.97958

y_j^R See identities (R18) and (N18) table 5.7.

Notes. "Nominal" implies billions of domestic currency units (DCUs). "Real" implies billions of 1970 DCUs. The nature of each series is indicated following its description by SA if it is seasonally adjusted and any of the following which (generally) apply:

AR	flows at annual rates
EQ	end of quarter data
LMAD	average of daily data for last month of quarter
LMAW	average of weekly data for last month of quarter
QAD	quarterly average of daily data
QAEM	quarterly average of end-of-month data
QAM	quarterly average of monthly data
QAW	quarterly average of weekly data

[†] The q in the descriptions of the ARIMA processes for $\hat{g}_j$, $\hat{M}_j$, and $\hat{x}_j$ indicates the highest-order moving average term which was fitted; some θ_i (indicated in square brackets) were, however, constrained to equal 0 in the estimation.

Table 6.21 **Dollar Price Index of Venezuelan Crude Oil (VPOIL; 1970 = 100)**

	Quarters			
Year	1	2	3	4
1955	105.015	105.015	105.015	103.052
1956	103.052	104.034	103.052	102.071
1957	106.978	107.959	107.959	107.959
1958	107.959	107.959	107.959	110.904
1959	105.015	99.1264	99.1264	99.1264
1960	100.	100.	100.	100.
1961	100.	100.	100.	100.
1962	100.	100.	100.	100.
1963	100.	100.	100.	100.
1964	100.	100.	100.	100.
1965	100.	100.	100.	100.
1966	100.	100.	100.	100.
1967	100.	100.	100.	100.
1968	100.	100.	100.	100.
1969	100.	100.	100.	100.
1970	100.	100.	100.	100.
1971	117.	126.	121.	127.
1972	137.	122.	132.	131.
1973	142.	215.	215.	215.
1974	550.	550.	550.	572.
1975	587.	587.	587.	633.
1976	633.	608.	614.	632.
1977	683.	683.	683.	

Sources
Basic data from *International Financial Statistics.*
1955–59 data (base 1953 = 100): February 1958–62 issues, respectively.
1960–65 data (base 1958 = 100): February 1963–68 issues, respectively.
1966–67 data (base 1963 = 100): February 1970–71 issues, respectively.
1968–70 data (base 1963 = 100): February 1972 issue.
1971–72 data (base 1971 = 100): February 1975 issue.
1973–74 data (base 1971 = 100): February 1977 issue.
1975–77 data (base 1971 = 100): December 1977 issue.
All of the above observations were rebased to 1970 = 100 by repeated applications of the ratio method.