Chapter Seven

The Foreign and Government Sectors

7.1 THE FOREIGN SECTOR

There is one stochastic equation in the foreign sector, an equation determining the value of imports in real terms, IM_t. There is no foreign sector in the theoretical model, so that one cannot use anything in Volume I to guide the specification of the equation determining IM_t. The equation determining IM_t is Equation 24 in Table 2–3. The equation is the log form, and the left-hand side variable is the real per capita value of imports. The explanatory variables in the equation include: the price deflator for imports lagged two quarters (PIM_{t-2}), the price deflator for the sales of the firm sector lagged one quarter (PX_{t-1}), the real per capita value of sales of the firm sector (X_t/POP_t), and seven dummy variables to account for the effects of three dock strikes.

The price of imports relative to the price of domestically produced goods ought to be important in determining the demand for imports, as well as the size of the domestic sector itself, and this is what Equation 24 is designed to try to pick up. The coefficient estimates for Equation 24 indicate that the level of imports is more responsive to the price of domestically produced goods than it is to the price of imports. The estimate of the coefficient of $\log PX_{t-1}$ is about 3.8 times larger in absolute value than the estimate of the coefficient of $\log PIM_{t-2}$. The coefficient estimate for $\log(X_t/POP_t)$ is slightly greater than one.

The three other variables in the foreign sector that are endogenous, aside from IM_t, are the price of exports, PEX_t, the saving of the foreign sector, $SAVR_t$, and the value of securities held by the foreign sector, $SECR_t$. The value of $SECR_t$ is actually negative, as can be seen for 1971IV in Table 2–1, which means that the foreign sector is a net debtor with respect to the "all other" securities category. $SECR_t$ is determined in Equation 66 in Table 2–2. It is endogenous because $SAVR_t$ is endogenous. $SAVR_t$ is determined

in Equation 65 in Table 2-2, and it is endogenous because IM_t and PEX_t are endogenous. The negative of $SAVR_t$ is the U.S. balance of payments on current account. PEX_t is determined in Equation 28 in Table 2–2 as a function of PX_t.

The two most important variables that are taken to be exogenous in the foreign sector are the value of exports in real terms, EX_t, and the price deflator for imports, PIM_t. The other variables in the foreign sector that are exogenous are transfer payments from the household and government sectors to the foreign sector, $HRTRP_t$ and $GRTRP_t$, the value of demand deposits of the foreign sector, DDR_t, the gold and foreign exchange holdings of the government sector, $GFXG_t$, and the discrepancy of the foreign sector, $DISR_t$. Since DDR_t and $GFXG_t$ are exogenous, any net saving or dissaving on the part of the foreign sector takes the form in the model of an increase or decrease in the value of $SECR_t$.

Although the present treatment of the foreign sector is fairly simple, it does take into account relative price effects on the demand for imports and keeps track of the flows of funds between the domestic and foreign sectors. It is clearly beyond the scope of this study, however, to endogenize either the import price deflator or the real value of exports.

Some thought was given to the question of whether it is reasonable to take the gold and foreign exchange holdings of the government sector ($GFXG_t$) as exogenous. If capital flows into and out of the United States are responsive to interest rates in the United States, then $GFXG_t$ should not be taken to be exogenous. An alternative approach would be to take some foreign interest rate (such as the Eurodollar rate) as exogenous, endogenize $GFXG_t$, and take $GFXG_t$ to be responsive to the spread between the U.S. bill rate and the foreign interest rate. It appears to be the case, however, that foreign interest rates are quite responsive to the U.S. interest rates (see Cooper [11] for a good discussion of this issue), and so it seemed more reasonable to take $GFXG_t$ as exogenous (from the point of view of U.S. domestic activities) than to take something like the Eurodollar rate as exogenous.

7.2 THE GOVERNMENT SECTOR

Accounting for all the flows of funds in the system implies (as was seen in Chapter Two) that the government budget constraint is automatically satisfied. It also means that one can consider explicitly in the model the direct purchase and sale of government securities. In other words, the value of government securities outstanding, VBG_t, can be taken to be a direct policy variable of the government. The fact that the government budget constraint is satisfied means, from Equation 69 in Table 2–2, that any nonzero level of saving of the government must result in the change in at least one of the following five items: VBG_t, $BORR_t$, $CURR_t$, BR_t, and $GFXG_t$.

Since $CURR_t$ and $GXFG_t$ are taken to be exogenous, this means that any nonzero level of saving of the government must result in the change in either the value of government securities outstanding, commerical bank borrowing, or bank reserves.

There are two stochastic equations in the government sector, one determining the value of unemployment insurance benefits, TPU_t, and one determining the interest payments of the government, $INTG_t$. Equation 25 in Table 2–3 explains TPU_t. It is in log form and includes as explanatory variables the number of people unemployed (U_t) and the price deflator for firm sales lagged one quarter (PX_{t-1}). The inclusion of the price deflator in the equation reflects the assumption that the government changes the current dollar value of unemployment insurance benefits as the general price level changes.

Equation 26 in Table 2–3 explains $INTG_t$. It is in log form and includes as explanatory variables the value of government securities outstanding, the bill rate, the bond rate, and $INTG_{t-1}$. In the theoretical model the interest paid by the government is equal to $r_t VBILLG_t + BONDG_t$, where r_t is the bill rate, $VBILLG_t$ is the value of bills outstanding, and $BONDG_t$ is the number of bonds (consols) outstanding. In the empirical model VBG_t includes both the value of bills and the value of bonds, and so it seems reasonable to include both the bill rate and the bond rate in Equation 26 to try to pick up the effects of both interest rates on the interest paid by the government. It appeared to be possible in this case to pick up separate effects of the two rates. This is in contrast to the case for the firm sector, where separate effects could not be obtained in Equation 18.

The other variables in the government sector that are endogenous are the price of goods purchased, PG_t, the civilian wage rate, WGC_t, the military wage rate, WGM_t, the net value of taxes paid, TAX_t, and the saving of the government sector, $SAVG_t$. PG_t is determined in Equation 36 in Table 2–2 as a function of PX_t, and WGC_t and WGM_t are determined in Equations 38 and 39 as functions of WF_t. TAX_t is defined in Equation 67 in Table 2–2 as the sum of the net taxes paid by the household, firm, and financial sectors. $SAVG_t$ is determined in Equation 68 as the difference between TAX_t and the expenditures of the government sector.

Some experimentation was done to see if other variables of the government sector ought to be treated as endogenous. The main question considered was whether state and local government expenditures on goods and/or services are responsive to interest rates and therefore should be treated as endogenous. Little evidence could be found that these expenditures are responsive to interest rates, and in the end it was decided not to endogenize them. There seemed to be little harm in treating all government expenditures on goods (in real terms) and all government jobs and hours paid per job as exogenous.

Table 7–1. The Exogenous Variables in the Government Sector

$\dagger CURR_t$ = value of currency outstanding less the value of demand deposits of the government sector, *BCURT*.
$\dagger d_{1t}$ = profit tax rate
$\dagger d_{3t}$ = one of the two personal income tax rates
$\dagger d_{4t}$ = indirect business tax rate
$\dagger d_{5t}$ = employer social security tax rate
$\dagger d_{6t}$ = employee social security tax rate
$\dagger DEP_t$ = depreciation of the firm sector, *BCURT*
$\dagger DTAXCR_t$ = investment tax credit variable
$DISG_t$ = discrepancy of the government sector, *BCURT*
g_{1t} = reserve requirement ratio
$GFXG_t$ = value of gold and foreign exchange of the government sector, *BCURT*
$GHSUB_t$ = net subsidies of government enterprises, *BCURT*
$GHWLD_t$ = wage accruals less disbursements of the government sector, *BCURT*
$GRTRP_t$ = transfer payments from the government sector to the foreign sector, *BCURT*
$HPGC_t$ = average number of hours paid per civilian job per quarter by the government sector
$HPGM_t$ = average number of hours paid per military job per quarter by the government sector
$\dagger JOBGC_t$ = number of civilian jobs in the government sector
$JOBGM_t$ = number of military jobs in the government sector
$\dagger RD_t$ = the discount rate
$\dagger VBG_t$ = value of government securities, *BCURT*
$\dagger XG_t$ = purchases of goods of the government sector, B1958
$\dagger YG_t$ = transfer payments from the government sector to the household sector, not counting TPU_t, *BCURT*
τ = progressivity tax parameter in the personal income tax equation

Note: A † denotes that the effects on the economy of changing this variable are examined in section 9.3.

The exogenous variables in the government sector are listed in Table 7–1 in alphabetic order. The important variables affecting the household sector directly are the personal income tax rates (d_{3t} and τ), the indirect business tax rate (d_{4t}), the social security tax rates (d_{5t} and d_{6t}), the employment variables ($HPGC_t$, $HPGM_t$, $JOBGC_t$, and $JOBGM_t$), and the level of transfer payments (YG_t). The important variables affecting the firm sector directly are the profit tax rate (d_{1t}), depreciation (DEP_t), the investment tax credit variable ($DTAXCR_t$), and the purchase of goods (XG_t). The important variables affecting the financial sector directly are the reserve requirement ratio (g_{1t}), the discount rate (RD_t), and the value of government securities outstanding (VBG_t). The depreciation of the firm sector is considered to be an exogenous variable in the government sector in the sense that the government controls by law the various allowable depreciation rates. The effects on the economy of changing the various exogenous variables of the government will be examined in Chapters Nine and Ten.