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ALTERNATIVE FINANCIAL STRATEGIES: THE RESULTS OF SOME POLICY SIMULATIONS WITH THE MULTI-COUNTRY MODEL

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1. Introduction

In this paper, we report on a set of policy simulations with the Multi-Country Model (MCM) developed by the staff of the Federal Reserve Board.

A description of the MCM is outside the domain of this paper. We will simply point out that it is a large scale econometric model which explicitly models the economies of the U.S. and four of its largest trading partners. Particular emphasis is placed on international linkages and financial relationships. Full descriptions of the model are available elsewhere.1/ This paper reports on an exercise which is the first attempt to use the MCM to systematically analyze alternative financial policies. In particular, we have chosen to compare and contrast the properties of the MCM with the small theoretical models of Bryant (1980) and Henderson (1982). These open-economy models are extensions of the classic Poole (1970) article. In its simplest form, they are designed to answer the question of which instruments policy makers should control in order to most effectively minimize variations in output when confronted by various types of unforseen shocks to the

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economy. The answer, equally simply put, is that it depends on the source of the initial disturbance: output is best insulated from disturbances originating in the home goods market by holding aggregates (i.e., money and official reserves) constant, while financial disturbances are best dealt with by fixing interest and exchange rates.[2/] Furthermore, if either a goods market disturbance or an asset market disturbance involves the foreign country as well as the home country, then these theoretical models suggest that there is no policy conflict between the home and foreign authorities; the same policy prescription is appropriate for both countries. However, cases of policy conflict can occur if the shock is confined to one country. In some cases it can be shown that the optimal policy for one country is inimical to the foreign economy.

A number of results emerge from the simulations. In some instances they point out areas of the econometric model that suggest themselves for further development, such as the specification of the consumption function. In other cases, the simulations draw attention to items that are frequently abstracted from in theoretical models; factors that can not be safely ignored by policy makers. Three of these factors are the effect that changing the indebtedness has on balance of payments through service flows, third country effects, and the richer dynamics included in large scale models. Finally, and of some policy interest, is the discovery in the simulations of the added importance of the definition of money in an open economy. Specifically, the existance of foreign currency denominated bonds can potentially alter the interest rate elasticity of the demand for broadly defined money enough to be a concern for policy makers who are considering an aggregates-constant policy.

We begin, in Section II, with a short exposition of the underlying theoretical models. In Section III, we describe and analyze the simulation results of three different types of shocks on the five MCM countries. Section IV develops the idea, again with simulations, that the choice of a monetary aggregate is particularly important in an open economy. In the final section we summarize our findings and draw some conclusions.

II--The Theoretical Underpinnings

The basic issue that we are trying to analyze with the MCM has its earliest expression in the classic work by Poole (1970). In that paper, the question of stabilizing interest rates as opposed to monetary aggregates is analyzed in terms of the source of the exogenous disturbances. The criterion for preferring one regime to another is based on the variance of real output. As it turns out, real output is better insulated from financial shocks (e.g. exogenous shifts in the supply or demand for money) if interest rates are pegged, rather than if the money supply is fixed. Similarly, the effect of real-side disturbances (e.g., shifts in the consumption or investment functions) on income are less if the aggregate is fixed than if the interest rate is held constant. In the former case, induced changes in interest rates serve to moderate the impact on income.

In what follows, we attempt to sketch out the theoretical model that we use as a reference point. The particular theoretical model that we describe in this section does not correspond in all respects to the MCM. We shall occassionally discuss differences between the two in the next two sections. Never the less, they share many common properties and a study of a small theoretical model was a useful first step in developing our intuition about the properties of the large scale MCM. A rigorous derivation and presentation of the theoretical model can be found in Henderson (1982). A narrative description of the same type of model can be found in Bryant (1980, Chapter 21).

We begin by focusing on three markets; the goods market, the money market and the home bonds market. Aggregate demand is a positive function of income in the home and in the foreign country, real interest rates in both countries, and relative prices as well as the level of the exchange rate and domestic prices. The latter two variables have "Pigou" type effects. A drop in prices or a depreciation of the home currency increases the value of wealth, measured in the home currency, and thus increases consumption.[3/] The exchange rate enters the relative price variable directly and, as an element of price expectations, it also appears in the real interest rate term. The supply of output derives its elasticity from price surprises. Labor agrees to a one period nominal wage, which without price prediction errors, would result in full employment output. If labor underforecasts the price level then the real wage will be low enough for output to exceed its full-employment level. The loci of goods market equilibrium in nominal interest-real output space is shown in Fig. 1 as line XX.

Money market equilibrium is depicted by loci MM. The demand for money is a function of income, home prices, the price of the foreign goods expressed in the home currency, the home (nominal) interest rate and the foreign interest rate adjusted for exchange rate expectations. Thus, the exchange rate enters both as a transactions variable and as a rate-of-return variable. The supply of money is taken to be exogenous.

The demand for home currency bonds is a function of the same variables as the demand for money functions in the two countries (as is the demand for foreign currency assets, the omitted market in this model). Additionally, it is posited that the interest rate elasticity on home bonds is higher than that of home currency, and that the income

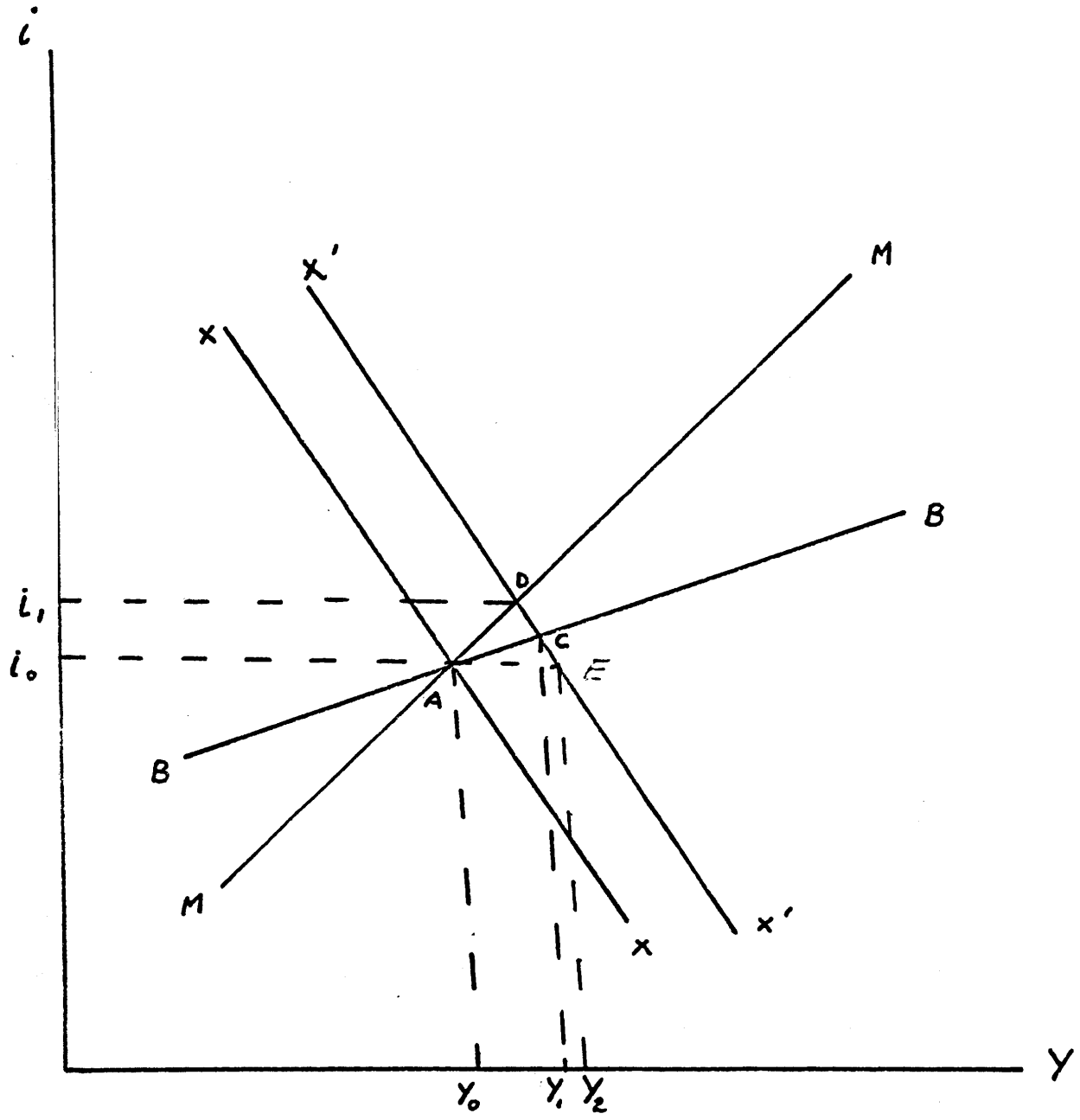


Figure 1

elasticity of the demand for home money is higher, absolutely, than the income elasticity in the demand for home currency bonds. It is further assumed that residents may hold the bonds of both countries but only hold the currency of their own country. These factors imply a bond market equilibrium, BB in Figure 1, with a flatter slope than the money-market equilibrium line. The supply of bonds, an outside asset, is taken to be exogenous.

The natural inclination of many readers may be to view Figure 1 as a conventional IS-LM-BP diagram. The parallels are strong and in analyzing many questions no harm would be done by interchanging the two diagrams. However, they are not identical and it is useful to spell out how they differ. First, the BB line is not the same as the external constraint facing the economy. It does not incorporate export and import functions. It is not a difficult task to incorporate these considerations and, over a wide range of import propensities and asset substitutability parameters, the results are unlikely to be qualitatively affected. Second, the textbook IS-LM-BP diagram treats the price level as exogenous whereas Figure 1 does not. In the diagram, the price level has been solved for by using the aggregate supply relationship that holds when the nominal wage rate is consistent with full employment. Finally, the traditional model is an end-of-period balancing model, whereas the model described in Figure 1 is a beginning-of-period model. This means, for example, that any wealth changes produced by a current account imbalance affect the system at the beginning of the next period, not at the end of the current period.

Consider the shift of the goods-market equilibrium, from XX to X^1X^1 in Figure 1. Such a shift might reflect either a shift in a

country's consumption function or a shift in preferences from home goods over foreign goods.

If the authorities respond to this perturbation by fixing money and not intervening in the exchange market, then the home interest rate will rise and the home currency will appreciate. This latter effect leads to a moderation of the original increase in demand as well as a decrease in the demand for money and home bonds. Thus equilibrium will occur in the triangle ACD, at an income level no greater than Y_1. If, on the other hand, the authorities respond by fixing the interest and exchange rates, then the stocks of money and bonds become endogenous and will change until they pass through point E. At point E, the level of income is at Y_2, a level that represents a larger disturbance in output than occured when aggregates were held constant. By fixing aggregates, in this case, the damping effects of interest rates and exchange rates are called into play. However, endogenizing these variables does not always serve to diminish the effects of exogenous disturbances on output and indeed may serve to exacerbate them. Such a case is shown in Figure 2.

Here the shock is a shift in asset preferences--an increase in the demand for home currency bonds and a concomitant decrease in the demand for foreign currency bonds. This is shown as a shift in the BB line to B^1B^1.

If neither the exchange rate nor the interest rate move, then no pressure is exerted on output and it remains at Y_o. In this case, the central bank has simply accomodated the shift in the public's asset preferences by altering their own supplies in a manner which exactly offsets the altered demands and eliminates any need for exchange-rate

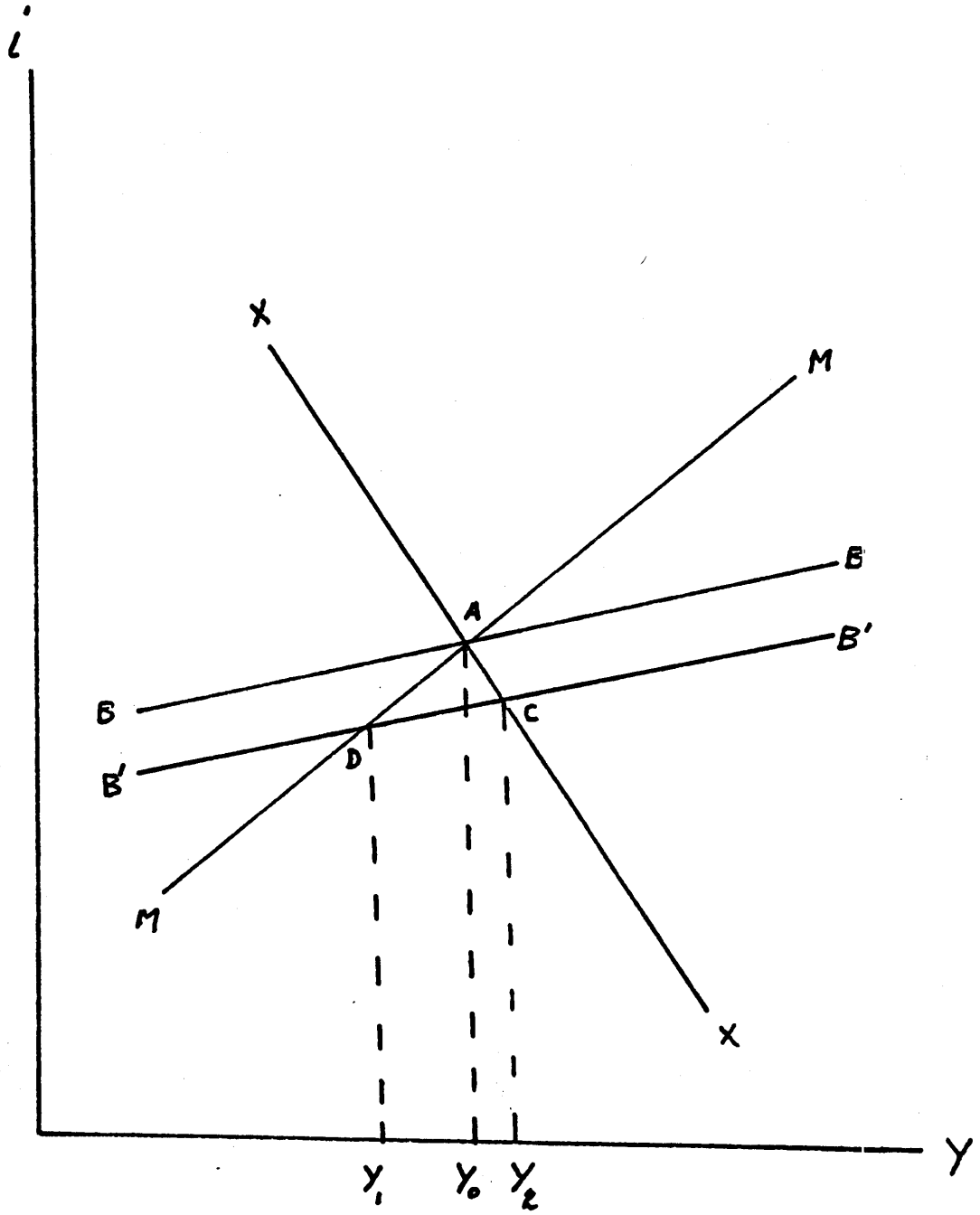


Figure 2

adjustment. If, however, the authorities strive to maintain both the money supply and the stock of official reserves (i.e., their holdings of foreign currency bonds) constant, then the interest rate and the exchange rate must adjust to equilibrate the altered demands and the unchanged asset supplies. The increased demand for home-currency assets will, in the first instance, put downward pressure on the interest rate and tend to appreciate the exchange rate. The new equilibrium will occur in the triangle ADC in Figure 2. The appreciation will shift the MM function to the right, the bond-market function upwards from B^1B^1 and the XX function to the left. Output will rise if the expansionary effects of lower interest rates outweigh the contractionary effects of an appreciated currency. Conversely, if the exchange rate effect is greater, output will fall. In either case the variability of income is higher with fixed aggreates than fixed rates.

The following chart was prompted by a similar one found in Bryant (1980). It summarizes the effect on output in three possible cases--a shift in demand to foreign goods from home goods, a shift from home savings to increased consumption of home goods, and a shift in asset preferences in favor of home-currency bonds. The first two shocks are depicted in Figure 1, the last in Figure 2. The chart also lists a column for the foreign country. One of the issues we discuss in this paper is whether the preferred policy choice from the home country's point of view is also preferred by foreign countries or whether it creates a policy conflict. The last column of the chart summarizes this topic. The deriviation of the results is not shown here but can be found in Henderson (1982).[4/] The intuition is none the less straight-forward. Consider the second case in Chart 1, an increase in consumption

SUMMARY OF SHORT-RUN OUTPUT EFFECTS
FROM VARIOUS EXOGENOUS DISTURBANCES

TYPE OF DISTURBANCE	AT HOME		ABROAD		POLICY CONFLICT?
	Rates Fixed	Aggregates fixed	Rates Fixed	Aggregates fixed	
Increase in demand for foreign goods equal to a decrease in demand for home goods.	M ↓ R ↓ Y ↓↓ Income falls more in the fixed rate case. There is no decrease in the interest rate or depreciation to moderate aggregate demand.	r ↓ e ↑ Y ↓	M ↑ R ↑ Y ↑↑ Income rises less in the fixed rate case. The increase in demand is partially offset by interest rate increases and appreciation of the foreign currency.	r ↑ e ↑ Y ↑	NO both countries prefer to fix aggregates
Increase in demand for home goods equal to decrease in savings.	M ↑ R ↑ Y ↑↑ An increase in interest rates and appreciation of the home currency moderate demand in the aggregates fixed case. This income changes less there.	r ↑ e ↓ Y ↑	M ↑ R ↑ Y ↑ Variable exchange rate exacerbates the export stimulus	r ↑ e ↓ Y ↑↑	YES home country prefers fixing aggregates, the foreign country prefers fixing rates.
Increase in demand for home currency bonds equal to decrease in demand for foreign currency bonds.	$\bar{M}$ (unchanged) R ↑ $\bar{Y}$ (unchanged) Income is unaffected if the authorities stabilize rates.	r ↓ e ↓ Y ↑	$\bar{M}$ (unchanged) R ↓ $\bar{Y}$ (unchanged) Income may increase or decrease if aggregates are stabilized. The interest and exchange rates work at cross purposes.	r ↓ e ↓ Y ↓	NO both countries prefer to fix rates.

M = Money
R = Foreign Exchange Reserves
Y = Output
e = exchange rate (home currency/foreign currency)
r = interest rate

of the home good equal to a decrease in savings. If a shift up in the consumption function in the home country is allowed to appreciate the home currency (because the home authorities choose to stabilize aggregates) then the effect on foreign income is amplified above and beyond the expansionary effects that home output would have on foreign output if rates were held constant.

III. The Simulation Results

Our motivation for undertaking this exercise was three-fold. First, by conditioning our "priors" these small theoretical models serve as a convenient reference point for larger (MCM) scale simulations. Our initial expectation was that these simulations might well uncover some previously unknown problems with the model. Second, we thought that the richness of a large model might point out some areas that the small models might fruitfully be enlarged to incorporate. For example, the MCM explicitly models the service account, allows for capital formation, accounts for the effects of savings within the period (i.e., is an end-of-period model), incorporates "third-country" effects in its analysis, and has a rather elaborate dynamic structure. These are all areas which the small models ignore as a matter of analytical convenience, yet they are potentially important both in accurately modeling the economy and for policymaking. Last, it was our hope that we might discover in our simulations some aspect that would be of interest to policy makers. We believe that the results of using alternative measures of money in the fixed aggregates simulations shed some new light on the question of whether broadly or narrowly defined money is potentially best suited to

stabilization purposes. (This idea is further developed in Section IV.)

In considering alternative policy regimes, we have chosen two polar strategies. That is, we assume either that the authorities fix both the money supply and the stock of foreign exchange reserves (and thus allow the exchange rate and the interest rate to be endogenously determined) or that they do exactly the opposite and fix both the exchange and interest rates while endogenizing the two quantities. This choice is consistent with the idea that these "pure" strategies can be shown, in theory, to dominate the so called "mixed" strategies (i.e., fixing one rate and one quantity).[5/] Our simulations also assume that policy makers do not respond to any information which the endogenously determined variables provide, rather they set policy at the beginning of the period and adhere to it. Consider, for example, the case where money is fixed by policy makers to be consistent with some level of real activity. Now imagine an unexpected positive real-side shock. Policy makers observe an immediate but unexpected increase in the interest rate (but, owing to measurement lags, cannot observe the increase in real output). Assuming they can rule out a shift in the demand for money, they can improve on the aggregates-constant policy by decreasing the money supply in response to the information provided by the increase in the interest rate. Of course it still remains true that an aggregates-constant policy is superior to a rates-constant policy. The point is simply that potentially this policy can be improved upon. This is a refinement which our simulations do not incorporate but it is certainly an area meriting future attention.

Three basic types of shocks were run. First, a switch in demand from home goods to foreign goods and second, a shift between home

goods and home savings. Both of these are real shocks and correspond to the top two rows of Chart 1 in the last section. The third shock is a financial shock consisting of a shift in asset preferences between home and foreign currency assets. It corresponds to the bottom row in the summary chart. The simulations were run over a 24 quarter period. In the case of the goods shocks, the disturbance was a one quarter change in demand, while the securities shock was a change in the one quarter flow. It was felt that these transitory shocks were preferable to permanent shocks because they do not pose the same conceptual problems for the long-run expected level of the exchange rate and prices. The two goods shocks were applied to each of the five MCM countries individually. The securities shock was run with the four non-U.S. MCM countries; the model structure would make running the shock on the U.S. a redundant exercise.

Unlike the presentation of classical statistical results, there is no well-defined manner of presenting simulation results. We have chosen to use a variety of methods, which all tend to tell the same story. Following the narrative discussion is a set of charts and tables. All of these results are presented in terms of deviations from the baseline solution. Both home income and a weighted average of foreign income are plotted for each country. These results, as well as values of the interest rate, exchange rate, the money supply and intervention are presented in tabular form. Finally, summary statistics for home and foreign income (means, variance, squarred deviations, and the sum of absolute deviations) over four different time horizons are presented.

Before we begin to analyze the individual shocks, it is important to spell out exactly what we mean by the various rates and aggregates which we will alternately endogenize and exogenize in the

simulations. The exchange rate is the bilateral U.S. dollar rate except in the U.S. where it is the trade weighted value of the dollar. The interest rate is the representative short-term interest rate. In the U.S. and Germany, this is the 30 day treasury bill rate, in Japan it is the gensaki rate. The finance company rate is used in Canada, while the local authority rate is used in the U.K. Official foreign exchange reserves are defined as the cummulated sum of earned foreign exchange reserves. They do not include capital gains or SDR allocations.

The definition of the stock of money is far less obvious than the definition of the above variables. Presumably in the real world, and certainly in the MCM, the authorities can choose to stabilize any collection of monetary assets either broadly or narrowly defined. The central monetary aggregate in the prototype MCM country is unborrowed reserves. The elasticity of this function is governed by the demard by the banking system's demand for free reserves. As an empirical matter, the interest rate elasticity tends to be very high in the MCM. In terms of the IS-LM framework, this implies that the LM curve is quite flat. Consequently, it is no surprise that there is not a great deal of difference between the fixed-rates case and the case where unborrowed reserves are fixed.

We have, therefore, opted not to stabilize unborrowed reserves in our simulations. Rather we have chosen to stabilize M1 in the U.S., Canada, Japan, and the U.K., and central bank money in Germany. This has the dual advantage of conforming much more closely to actual central bank behavior as well as providing results which are much more interesting to discuss. This theme, the choice of an appropriate monetary aggregate, is one we will return to again in the next section.

IIIA. The Home Goods/Foreign Goods Shock

In this shock we decreased demand for the home good by 5% of real domestic consumption for one quarter and increased the demand for the foreign good by the same amount. The theoretical models predict that both the home and foreign countries will better stabilize their output if they both fix their respective money supplies and official stocks of foreign currency bonds (hereafter "aggregates"), than if they stabilze the interest rate and exchange rate (hereafter "rates"). Holding the aggregates fixed induces lower interest rates and a depreciated currency in the home country and higher interest rates abroad, all of which serve to stabilize income in both countries.

Canada

The impact effect of the shock on Canadian output is indeed less when aggregates are fixed, just as the theory suggests. Income returns to its pre-shock level faster when interest rates are allowed to fall and the exchange rate to depreciate. The exchange rate is responsible for most of the improved relative performance of the aggregates-constant case early on with interest rates becoming increasingly important over time. In fact, endogenizing both of these rates is enough to generate income overshooting; this doesn't occur when rates are fixed. Income, in the fixed aggregates case, ultimately returns to very nearly its initial level largely because of positive interest rates that develop mid-way through the simulation.

Foreign income, as defined in the Canadian model, conforms to

our priors only on impact. The dramatic cycle reflects the large weight given to U.S income. In the U.S. there is an extremely strong investment multipler-accelerator mechanism, which is particularly volatile in the presence of variable rates.

The various aggregates behave as expected as does the exchange rate. The interest rate, which is positive at the end of the simulation, poses no problem once the income overshooting is allowed for.

Germany

In Germany, output patterns also conform to the pattern suggested by theory. In contrast to Canada, however, both the rates-and aggregates-constant policies lead to overshooting, though endogenizing the rates accelerates the return to the long-run level of output by moderating fluctuations in it. In both cases a trade surplus attributable to decreases in income and prices is the source of the initial rebound (and overshoot) in income. A traditional accelerater-multiplier has come into play by the second half of the simulation.

Only on impact is the response of foreign income unambiguously in accordance with the theory. The high volitility of the U.S. investment function when aggregates are fixed again provides the explanation for subsequent longer-run behavior.

Interest rates fall on impact as expected, and then cycle in a fashion consistant with output and price patterns, again as expected. The exchange rate is depreciated relative to the baseline, throughout the simulation. This reflects the fact that the lagged cummulated current account plays an expectational role in the MCM. Thus the current-account deficit, which is a product of the shock, gives rise to expectations of a

depreciation which is reflected in downward pressure on the exchange rate. Since this is a stock effect, and the initial shock is large relative to the subsequent trade flows, the effect is long lasting. The lagged cummulated current account is also the source of the continuing loss of reserves in the rates-constant case. Here the expectation of a weak currency manifests itself as a private capital outflow which must be accommodated by the central bank if rates are to be held constant. It is the lag on the expectational variable which explains why the second quarter effects are larger than the impact effects for both the exchange rate (aggregates-constant) and reserve losses (rates-constant) cases. This partially delayed effect on reserves and hence on the central bank's balance sheet is the reason why money drops more in the second quarter than in the first. Other than this minor anomaly, the behavior of money in the German model conforms to our theoretical priors.

Japan

Inspection shows that there is very little difference between the rates-and aggregates-constant policies in the short run, but the theory is contradicted to the degree that differences do exist, The reason for this discrepancy is that the Japanese consumption function contains an inflation term. High inflation rates discourage consumption and encourage savings. When aggregates are fixed, the depreciation quickly feeds through to the inflation rate. The resulting increase in the inflation rate leads to a drop in the consumption function and hence income. This effect is obviously absent in the rates-constant case.

With the passage of time, the Japanese results come closer to satisfying our priors. By the end of the simulation, it is clear that

the aggregates-constant policy is in fact the preferred strategy.

One striking feature of the simulations is the extreme "chopiness" of Japanese output when rates are fixed. This is traceable to the large impact effect of the shock on the stock of official exchange reserves and the subsequent way in which this variable feeds through into foreign investment receipts. In particular, a pattern of seasonal factors which alternate in sign, is applied to the changed stock of reserves.

The behavior of foreign income on impact and over the following two years conforms to the predictions of our theory (i.e., aggregates constant is the preferred strategy). Over time, the volatility of U.S income, apparently resulting from a strong accelerator, causes the aggregates-constant strategy to induce a good deal more foreign income instability.

Interest rates fall on impact, as expected, but go up as prices and income levels rise above baseline. The other potential policy variables--the exchange rate, M1, and intervention--behave in the expected fashion. The exchange rate remains depressed throughout the entire simulation. M1 is also lower than control for all but a few quarters at the end, where reserve increases which occur in the final quarters of the simulation are monetized. Normally, we would expect intervention to be negative--i.e., lead to a loss in reserves. This happens for the first 19 quarters of the rates-constant simulation until there has been enough downward price and income adjustment to cause reserves to begin to climb.

U.K.

The chart showing the pattern of output in the U.K. under the

alternative strategies shows that the response is very nearly the same in both cases. The simulation results in Table 7 show, by mean and squared deviation criteria, that the properties of the theoretical model are violated for each and every time period.

The explanation of this puzzlement lies in the specification of the consumption function coupled with the choice of aggregates stabilized by the authorities. In the U.K., sterling M3 enters directly into the corsumption functions. In the aggregates baseline simulation M1 is fixed, and interest rates must fall to hold M1 at control because income falls dramatically on impact. As interest rates fall, time deposits and hence M3, and ultimately the consumption function, shift downward. The theoretical results might have held if the simulation had fixed M3, or if M3 did not appear in the consumption function.[6/]

In any event, the similar income paths suggest a very flat implicit LM function in the U.K. monetary sector. In this case, there is very little to choose between a rates-constant and an aggregates-constant strategy.

Were it not for the buffering effect of inventories the difference between the two paths would be more pronounced. The inventory equation is responsible for another feature of the simulations--their extreme chopiness. The lagged coefficient on inventory investment is -.7. Thus, once set in motion it causes income to follow a pattern of damped, one period oscillations.

By virtually all of the criteria presented in Table 8, foreign income behaves as expected in the U.K.. The four potential policy variables (i.e., the two rates and the two aggregates) seem to conform to the theoretical paradigm. The impact and short-run behavior in all cases

behavior in all cases is exactly as expected. The cyclical behavior of income is eventually reflected in the interest rate and exchange rate behavior. (It should be mentioned that in the rates-constant case, the local authority rate was fixed, not the short-term government rate whose changes are reflected in Table 3.)

The U.S.

Income in the U.S. returns faster and sooner to its control level when aggregates are fixed, exactly as theory suggests. However, it overshoots and cycles enough to cause the summary statistics of Table 7 to indicate that a rates-constant policy dominates over the long-run. Both trade and investment cycles contribute to this overshooting. This investment behavior is the flip side of foreign income behavior (as viewed from abroad) that has been discussed above. A strong multiplier/accelerator mechanism in the U.S. model causes income to overshoot even when rates are fixed.

The trade-weighted dollar generally depreciates as expected, though in the final five quarters of simulation lower income has led to an appreciation (the fact that the second quarter effect is larger than the impact effect can be traced to lags in the Canadian dollar/U.S. dollar equation.) Interest rates behave in the cyclical fashion required to keep the economy on its demand for M1 function while income cycles. Foreign income behavior conforms to our priors.

More often than not, the impact effects of the home good/foreign good shock conforms to the theory. In the two cases where they don't--the U.K. and Japan--the reasons for this divergence are

understood and easily explained.

IIIB. The Home Goods/Home Savings Shock

The theoretical model suggests that this shock will lead to a policy conflict. The home countries can best dampen the effects of the shift in its consumption function by fixing aggregates--the classic Poole solution. The foreign countries will be disturbed more by the change in the exchange rate which accompanies the home country's optimal policy than if rates were fixed. Thus, the preferred policies of the two countries conflict with one another: The home country wants a floating exchange rate regime, the foreign country prefers a fixed-rate regime.

To investigate this issue, we shifted the consumption function upwards by the same amount as the shock in the first case--5% of domestic consumption. The shock is not quite symmetrical with the home goods/foreign goods shock mentioned above. They differ not only in direction, but also in the fact that in this case there is no exogenous shift in imports, only a shift in the consumption function. Because there is no direct disturbance to the balance of payments, the difference between exchange rate regimes is lessened. This is certainly not to say, however, that there are not significant and important differences between the alternative policy strategies. We will therefore, as before, analyze the results on a country by country basis.

Canada

In Canada, the conventional wisdom holds and fixing aggregates does tend to buffer income more by inducing stabilizing movements in the rates. This is particularly true with the passage of time. Income

overshoots in both regimes but by less and more briefly in the fixed-aggregates case. We can trace this outcome to the net worth term in the consumption function. Initially, consumption rises more than income. The excess of consumption over income comes from a trade deficit and a draw-down of inventories. Lags in the consumption function magnify the impact effect. This in turn causes net worth to become negative. Ultimately, the persistent effect of a continuing lower level of wealth outweighs the effect of a transitory increase in the consumption function and causes income to fall below its initial value. The economy is clearly smoothed better when interest and exchange rates are free to move.

In the Canadian case, foreign income paths do seem to follow the expected pattern. Foreign income rises with activity in Canada, the more so if the Canadian dollar appreciates. Thus there is an inherent policy conflict between Canadian and foreign authorities.

The behavior of the potential policy variables (i.e., the various rates and aggregates in those simulations when they are endogenous) is easily explained. The lag in the exchange rate equation yields a larger change in the exchange rate one quarter after impact. Income changes govern movements in money in the rates-constant case. The cumulated basic balance, functioning as an exchange rate expectations proxy, is the principle determinant of intervention when rates are fixed.

Germany

In Germany, as in Canada, holding aggregates constant is the preferred policy from the German point of view. A drop in net worth and

its subsequent effect on the consumption function (exactly as described in the Canadian case) is a principle reason for the overshooting of income. A second reason is the effect of higher domestic prices on net exports and the subsequent effect of this variable in the dynamics of the income determination process.

The information describing the path of foreign income is more mixed. On impact, income abroad conforms to our priors, but thereafter it is less clear that there is a policy conflict. What is clear is that endogenizing the rates leads to a shorter income cycle though not necessarily one larger in amplitude.

The increase in the short-term interest rate merits some comment. The impact value is a good deal less than in the second quarter. This reflects the role of free reserves in the interest-rate equation. (Actually, the equation is more accurately described as a demand for free reserves function normalized on the interest rate.) The coefficient on lagged free reserves is slightly larger than its contemporaneous value. This, coupled with the fact that free reserves may be required to move a great deal to stabilize central bank money, means that the dynamics of the interest rate can be complex.

The exchange rate appreciates on impact, as expected, but by the third quarter depreciates below the baseline. This reflects the important role played by the lagged cumulative current account as an expectational variable. The expansion has led to deficits, which have in turn caused speculators to position themselves for a downward adjustment in the exchange rate and, in so doing, cause a depreciation to come about.

When rates are fixed, the lagged cumulated current account

plays an important role in determining the quantity of intervention. The second quarter effects surpass the impact effects for central bank money. Lags on consumption and income in the currency and demand deposit equations, respectively, account for this.

Japan

The econometric model results are in accordance with our prior expectations. Holding aggregates constant is the preferred strategy, though there is not a great deal of difference between the two policies. There is not the overshooting of income in the aggregates-constant case which we observed when there was a shift in preferences from home goods to foreign goods. This is because the effect on the current account, and hence exchange rate expectations, is milder when imports are not directly affected in the shock. In addition, domestic spending is not very sensitive to changes in the interest rate, especially in the short run. The discussion of the "chopiness" of income in the Japanese home goods/foreign goods shift discussed above applies here. It is traceable to changed official indebtedness and seasonality in the service accounts.

Foreign income is uniformly contrary to the predictions of the theoretical model. Thus, in this case, the MCM suggests that the potential for policy conflict is more imagined than real. A major part of the explanation for this centers on the effect of third currencies. For example, our theory suggests the Yen should appreciate with respect to the foreign currency and it does in fact appreciate against all currencies. However, the change is not proportional and the U.S. dollar rises relative to the DM and pound sterling. Since the income multiplier

is higher in the U.S. than in these other countries, the net effect was to dampen foreign income. Thus, in this case, foreign income is better stabilized when exchange rates are flexible.

United Kingdom

The domestic income paths conform to expectations based on the theoretical models. This was not the case when the shift in the consumption function was accompanied by a shift in import demand (i.e., the home goods/foreign goods shift described earlier.). Apparently, this reflects the impact the cumulated current account has on the exchange rate. In the present case, the current account deficits are lower. Consequently the impact appreciation is stronger and thus more effective in buffering income.

The behavior of the foreign income variable in the U.K. does not conform to our theory. This is the other side of the expectational process alluded to above. The surplus that accumulates abroad are soon reflected in both an expected, and then an actual, appreciation of the foreign currency. Thus, foreign income is better stabilized if rates are flexible than when they are held constant.

United States

The income path in the U.S. generates mixed results. On impact it conforms (barely) to our theory, in the short run it doesn't, while in the long run it does conform by some criteria, but not by others. In the short run, flexible rates apparently do more than dampen output, they trigger the accelerator/multiplier mechanism which is particularly strong in the U.S. model. Thus it seems that holding M1

constant in the U.S. both increases the frequency and the amplitude of the income cycle. The first property tends to auger in favor of the theoretical results, the second against it.

Foreign income is very nearly the same on impact (there is less than .01% difference between the two strategies) and conforms to our theory on the basis of the sum of squared deviations, arguably the most useful measure, although by some other criteria the theory is contravened. Third country effects are an important factor in comparing the two policy strategies. Only in Germany does comparing income conform to the theory, and it is the DM which has the largest depreciation. That is, it is only the DM which has unambiguously depreciated against all of the MCM currencies.

The potential policy variables behave as expected once the lag in the Canadian dollar equation (in the case of exchange rates) and income lags in the demand for money functions (in the case of interest rates and M1) are allowed for.

III.C The Securities Shock

In this, the final shock analyzed in this section, we simulated a change in asset preferences on the part of private wealth holders. Specifically, we postulate a shift of 4 billion dollars (U.S.) into home currency bonds (C$, ¥, DM or £) from U.S. dollar-denominated bonds. To the degree that portfolio managers view home and foreign currency bonds, suitably adjusted for exchange rate expectations, as perfect substitutes for one another, there will be no discernible macro-economic effects due to this change in preferences. But if wealth holders will hold different

relative supplies of assets only at different relative prices, then the exchange rate and interest rates must adjust with noticable effects on activity.

This simulation experiment corresponds to the description in the final row of Table 1. Assuming aggregates are constant, there will be downward pressure on the home interest rate and upward pressure on the external value of the home currency. The affect on income is ambiguous--the lower interest rates should increase output, the appreciated home currency should lower it. There is no motivation in the theoretical models for output to change if rates are held constant. In this case, the central bank has simply accommodated the changed preferences of the public. The classic Poole results hold and there is no policy conflict between nations.

We turn to the four country simulations. (There is no separate U.S. simulation. It would contain no new information, being simply the weighted mirror image of the four simulations that are presented.)

Canada

Initially, Canadian income is best stabilized by holding rates constant, as is expected. However, there is clearly a problem with this policy over the second half of the simulation. The oft neglected service account is at the root of this. Part of the shock involves increasing official holdings of U.S. bonds. This stock increase eventually has substantial, and continuing, foreign investment receipt implications on the service account. This is one aspect of the model which is sensitive to levels of the baseline variables, not just changes in them. In particular, the export surplus, and hence income, would have been less,

had the level of U.S. interest rates not been as high as they were in 1979 and 1980. In the aggregates-constant policy, reserves don't change and the service account cannot provide the impetus for growth in income. In this case, the exchange rate effects dominate the interest rate effects and income falls. This is generally the pattern, at least in the short run, in the other countries.

By and large, foreign income does not totally conform to our theory and thus a conflict between the home and foreign governments occurs. U.S. income dominates foreign income, as defined from a Canadian standpoint. In the short run the drop in Canadian income is reflected, via conventional trade linkages, in the U.S. income. As Canadian income becomes increasingly positive (because of the above mentioned service account effect), so it also does in the U.S. where it is amplified by the vigorous multiplier/accelerator found in the U.S. model. It appears that both the high level and the high variance of income abroad is just an echo of the home income path and if the service account item were smaller, then the simulations would conform more closely to the theoretical results.

The pattern with variable rates is largely as expected. The small impact U.S. dollar depreciation has, on balance, an expansionary effect on U.S. income initally, though lower rates of Canadian activity ultimately are reflected in the income paths of its trading partners. Canadian interest rates fall on impact, as expected, but owing to lags in the elements of the M1 function, and the small impact effect of the exchange rate on income and prices, it is not until the second quarter that the decline is pronounced. The exchange rate appreciates though the delayed effect is larger than the initial appreciation because of lags in

the model. M1 moves in harmony with income. Intervention is not only large on impact, as expected, but stays relatively large throughout the simulation. Normally, the cumulated basic balance serves as an expectational variable in the exchange-rate process. However, when the exchange rate is fixed, the same speculative forces that lead to an appreciation give rise to capital inflows and increases in official reserves.

Germany

Germany is the one country which comes the closest to satisfying all of the conditions implied by the theory. When rates are held constant, there is almost no variation in output. The small deviations that are measurable can be traced to the service account.

The impact effect of both the exchange rate and the interest rate is small relative to the delayed effect. It is only after two quarters of simulation that the effect on rates is noticably different from the fixed-rates case.

Japan

Japan is the one country where an aggregates-constant policy causes income to rise on impact. This fits within the range of theoretically possible outcomes, but it does raise the question of how the specification in Japan differs from the other MCM countries. The answer is found in an aspect of the consumption function already discussed. Specifically, the asset preference shift leads to a home currency appreciation and a lower inflation rate. This, in the Japanese model alone, leads to less savings and higher income. Eventually though,

the conventional effects come to dominate the income determination process.

When rates are fixed, on the other hand, the "chopiness" discussed in the other Japanese simulations is immediately apparent. The stock of assets used in generating service flows, and thus net exports, is transformed by a set of seasonal variables of alternating sign. This explains the irregularities in the income pattern. The shift from a strong negative effect to a path which seems to be very nearly centered on zero is explained by the fact that there is an asymmetry between income receipts and payments in the service account. Altering stocks of claims and liabilities gives rise to the expected services flows, but because of the empirically determined lags, they have a staggered impact on net exports.

By all criteria (save the impact effect) the rates-constant policy is superior, as theory suggests. The results are strengthened more if we allow for the service account items discussed above.

Our theory is confirmed again when we examine income behavior outside of Japan. In this case the fixed-rate strategy clearly dominates the alternative fixed-aggregate strategy. The depreciation of the foreign currency has caused a trade cycle abroad.

The increased demand for Yen bonds drives the interest rate down for two years. Ultimately, strong income growth coupled with the need to hold M1 constant leads to a rise in the domestic interest rate causing the Yen to appreciate. The subsequent overshoot is caused by current account deficits which develop in the course of the simulation and lead to expectations of a depreciation.

United Kingdom

The U.K. is the only country in which the domestic income path contravenes the theory in all regards. It is clear that holding rates constant exacerbates income movements rather than eliminates them. The problem here again is the inclusion of sterling M3 as an argument in the consumption function. Holding the short-term rate constant opens up a gap between it and the discount rate in the U.K. model. As a result time deposits, an M3 component, fall off, consumption drops and income follows. In addition, consumption declines because of the anomalous modelling of tax receipts in the U.K.. An increase in intervention is assumed to cause tax revenue to rise and thus disposable income to fall.

The path of foreign income is in agreement with the theoretical model.

IV. The Choice of an Aggregate

In the last section we postponed a full explanation of the rationale for using a narrow definition of money in those simulations where a monetary aggregate was held constant. In this section we want to develop this idea by first making some elementary theoretical points and then examining some simulations that differ only in the measure of money which is stabilized.

The basic point is easily stated in a closed system. In this case, with conventional assumptions about the sign of partials in asset demand functions and the assumption of gross substitutability, it can be shown that the interest rates and the demand for money are inversely related. However, in an open economy there is another asset (in addition

to narrowly defined money) that is negatively related to the domestic interest rates, namely foreign currency bonds. Thus, it is possible for the positive interest rate effect of an increase on the home rate on time deposits, and hence broadly defined money, to dominate the negative effect it has on narrowly defined money. A decrease in demand for foreign currency bonds provides an additional source of allocatable wealth.

This idea is illustrated with the aid of equations 1) through 4).

Equation 1) is the wealth (W) constraint for four types of financial wealth: narrowly defined money (M), time deposits (D) which together with M constitute broadly defined money, home-currency bonds (B) and foreign currency bonds (F).

1) $$M + D + B + F = W$$

Equations 2) and 3) show the effects of altering the domestic bond rate, RB, and the time deposit rate, RD, on the various assets in equation 1) and impose the constraint that the net effect be zero.

2) $$\frac{dW}{dRB} = \overset{-}{M}_{RB} + \overset{-}{D}_{RB} + \overset{+}{B}_{RB} + \overset{-}{F}_{RB} = 0$$

3) $$\frac{dW}{dRD} = \overset{-}{M}_{RD} + \overset{+}{D}_{RD} + \overset{-}{B}_{RD} + \overset{-}{F}_{RD} = 0$$

Equation 4) is the sum of equations 2) and 3).

$$4) \qquad \overset{-}{M}_{RB} + \overset{-}{M}_{RD} + \overset{-}{D}_{RB} + \overset{+}{D}_{RD} + \overset{+}{B}_{RB} + \overset{-}{B}_{RD} + \overset{-}{F}_{RD} + \overset{-}{F}_{RB} = 0$$

The first two elements in equation 4) describe the effect of changes in domestic interest rates on narrow money which is unambiguously negative. The first four elements describe the same interest rate effect on broadly defined money. The effect may be positive or negative. Perhaps this is best seen by referring to the last four elements of the equation which summarize the interest rate effects on the bond market. Assuming gross substitution (i.e., $B_{RB} + F_{RB} > 0$), it appears that if there are sufficiently strong negative RD effects on both types of bonds, then the bond market reaction can be negative. This implies that it is possible for the interest rate effect on the demand for broad money to be positive.

Should this be the case, then the money market equilibrium line, MM, in Figures 1 and 2 is negatively, not positively, sloped. In this case, the output consequences of increased demand for home goods will be the exact reverse of the conventional case. In the conventional case, an increase in goods demand causes both interest rates and output to increase with the rise in the latter, tempering the former. However, if money-market equilibrium is described by a negative line in home interest rate-output space, (i.e., the interest rate elasticity of the demand for money is positive) then the increase in interest rates associated with the demand shift is large enough to actually result in a lower level of output after the increase in aggregate demand.[7/] Thus interest rates and output are inversely related to one another when there is a shift in goods demand.[8/] In these circumstances, the conventional

wisdom concerning the optimal policy strategy may not hold.

Thus the choice of an appropriate aggregate in an open economy has an additional dimension. Policy makers must be alert to the fact that foreign asset market considerations do affect the elasticity of the demand for money and, in the limit, can reverse the sign of the home-interest rate on the demand for broadly defined money. Furthermore, these factors may have substantial policy implications.

As it turns out, these conditions are met in the Canadian portion of the MCM: the own effect of the interest rate on the demand for time deposits is strong, as is the effect of interest-rate changes on the demand for foreign bonds.

We simulated the same three shocks discussed earlier (foreign goods for home goods, foreign savings for home savings, and foreign bonds for home bonds) in the Canadian model with three definitions of money--unborrowed base, M1 and M2--as well as the fixed rate regime.[9/] In the Canadian model (as well as the German, Japan, and U.S. model) the net demand for base money is interest elastic. This modifies Figure 1 so that the MM curve may be more elastic than the BB curve. In this framework, a shift in goods demand may produce either more or less output variation than the fixed rates case. While a positive demand shift produces a higher interest rate, it also causes the exchange rate to depreciate. To the extent that the increase in output resulting from the depreciation outweights the dampening effect of higher interest rates, the fixed-rates case may dominate fixed aggregates. Thus an ambiguity arises over the correct policy choice and will depend upon the model's parameters. As the simulations below indicate, in the fixed base case, the MM line becomes nearly horizontal and the results are quite

similar to the fixed-rates policy. In sum, we have no prior notion that exogenizing either base or M2 is necessarily preferable to a rates-constant policy.

The Home Goods-Foreign Goods Shock

This is the case where a fixed aggregate should dominate a fixed rate strategy for reasons discussed earlier. This statement is true as long as we restrict our definition to M1 or base. However, the situation changes when M2 is entertained as a possible definition. Of the three measures, it is the most interest inelastic (albeit with a "perverse" sign) and this is enough to minimize the disturbance to real output. This need not necessarily be the case. If the income multiplier effect is strong, then the interest and exchange rate effects will be also. Here the shock involves not only a shift in the consumption function, but an increase in imports. Thus the net effect on income and other variables is less than it would be if the consumption function alone shifted. We shall return to this point in discussing the next simulation.

Thus, while fixing M2 does best stabilize income in this case. It is associated with extreme variation in the interest rate and exchange rate. In other words, M2 stabilizes output despite, not because of, the exchange rate effects. That these exchange rates effects can be destabilizing to income can be verified by examining foreign income. Here the high variability in income outside Canada can be traced to the volatility of the exchange rate. There is a clear policy conflict here. M2 is preferred from a Canadian perspective while, (except on impact) any other measure of money or a rates-constant policy would be preferred by

foreigners. As mentioned earlier, the base constant case is similar to the fixed-rates case, but it does dominate it.

IVA. The Home Goods-Home Savings Shift

This case is analytically similar to the above case except that there is no change in import leakages (i.e., external constraint) associated with the consumption function shift. This means that the total income effect of a given exogenous shock will be greater, as will be the interest rate effect. The appreciation of the exchange rate serves to amplify the income diminishing effects of the shock when M2 is held constant compared to the (much smaller) appreciation resulting when M1 is fixed. The contractionary impact of the appreciation is so great that it is possible for M2 to be an inferior strategy to even a rates-constant strategy for a real-side shock. And, by the criterion of the sum of squared deviations, this is exactly what happens here. In addition, we find that the very interest inelastic-M2 function requires very large interest rate movements to stabilize M2, as opposed to the other more narrowly defined measures of money. These relatively large interest rate movements were also found in the previous shock. It is worth noting that, except on impact, the fixed rates case dominates the fixed aggregates model when base is exogenous.

IVB. The Home Bond-Foreign Bond Shock

This is a case where an M2 constant policy is clearly preferable to a rates-constant policy for all time dimensions except on impact. There are two questions to be answered here. First, why is M2 a

superior aggregate to M1 and base, and second, why doesn't a rates-constant regime dominate a fixed M2 policy in the same way that it does a fixed-M1 or base policy?

The first question can be answered in a relatively straightforward fashion. The less interest and exchange rate sensitive the demand for money is, regardless of its sign, the less responsive output will be. This is the case in the Canadian model and explains why M2 is a superior aggregate to M1 or base in the face of a shift in asset preferences.

The second question concerning the relative superiority of a constant M2 over a rates constant policy is more puzzling, at least on the surface. Alternatively stated, why should a policy which presumably allows absolutely no variation in either the exchange rate or the interest rate from a financial disturbance have more of an effect on home output than a policy which does? The answer is two-fold. First, the rates-constant policy does have output implications via the service account. This aspect was discussed in the last section. Second, the relative absence of movement in income when M2 is held constant is due not to the fact that components of income are largely unaffected by the large interest and exchange rate cycles but because they tend to offset one another. A trade and an investment cycle are superimposed on one another in such a fashion that variations in output are minimized. In general, this need not be the case. It is not so much related to the use of M2 as an aggregate, per se, as it is to the particular lags applied to the interest rate and the exchange rate in the investment and trade functions respectively.

In sum it seems likely, given the small effects of exchange

rate movement on the demand for monetary assets, that fixing M2 will stabilize output better than more narrowly defined aggregates though this will involve substantial interest and exchange rate variation. However, there is no theoretical presumption that it should dominate a fixed rate regime, though it may do so if there are relatively complex lag structures in the real side of the model.

V. Conclusions

Large macro models are complex and cumbersome things. They are often difficult to decipher in a straightforward manner. We have found that it is useful, perhaps necessary, to approach our study of the stabilization properites of the MCM by first using a very small theoretical model to develop our "priors" on how an economy, and thereby an econometric model of it, should respond to a variety of shocks under different policy arrangements. Our purpose has been two-fold. First, we thought it possible that by comparing results of MCM simulations with the theoretical results of a small model, we might discover some flaws in the econometric model which are not obvious when individual equations are examined in isolation from one another. Indeed some of the specific results discussed in the simulations reflected unanticipated and undesirable interactions between equations. The systemic properties of the model, given the perspective afforded by the small model, will lead to some modifications of the MCM (the interaction between the service flows seasonal dummies and intervention is a case in point).

Secondly, and equally important, we hoped the structural and dynamic richness of a large scale econometric model might point to important elements from which the theoretical models have abstracted. We have seen how important service flows can be when there are either large changes in the stock of international indebtedness or large changes in the interest rates which govern the size of flows of investment payments and receipts. There are also circumstances in which third country effects have been able to explain qualitative differences between the empirical and theoretical models. Similarly, the one period theoretical models lack the time dimension to encompass overshooting, a

property common to most of the reported simulations. More specifically, seemingly small differences in consumption functions--the inclusion of a net worth term in Canada, an inflationary term in Japan and a sterling M3 term in the U.K.--were reponsible for a good deal of diversity among the various country results. In some cases these are features that can be incorporated into a small theoretical model, in others perhaps they are best allowed for by incorporating them into the analysis less rigorously.

One item of particular note is the discovery of the importance of the precise definition of the monetary aggregate in an open economy. Apparently differences in the definition of money can, in some circumstances, be more important than the choice of regime (fixed aggregates or fixed rates) in stabilizing output.

What has made this project both difficult and challenging is the absence of a small number of generally accepted statistical measures of simulation results. We formulated our experiments in terms of whether a given financial policy would lead to more or less movement in income than an alternative policy. There are a variety of ways of measuring and describing the behavior of income over various subperiods of the simulation. We have tried to be generous with tables of actual values and a variety of computed statistics and charts while, at the same time, trying to be clear as to our own interpretation of them. We may actually have imposed more order than was warranted.

Given the similar structural and conceptual similarities among the MCM models, there is an amazing amount of diversity in the simulation properties of the various country models.[10/]

Finally, it seems appropriate to mention potentially useful

extensions of the project reported here. It would be interesting to let policy makers react to the information content that potential policy variables contain. (e.g., exchange rate and/or interest-rate movements when aggregates are fixed.) More complex yet would be the extension of this study to mixed strategies in the face of uncertainty. A quite separate possibility would be the use of perfect foresight (rational) expectations in simulation. Independent of this project, we have done some preliminary work in this area, and it would be interesting to incorporate that work in the present study.

Footnotes

1/ In particular, see Stevens (1983), Haas and Symansky (1983), Hooper, et. al. (1983) and Quantitative Studies Section (1983).

2/ When referring to "aggregates constant" or "fixed rates" policies, we imply targetting on a predetermined path which involves changes in aggregates or rates over time, but which remain unchanged in the face of real and financial disturbances.

3/ Assuming the country is a net holder of foreign currency assets.

4/ Henderson (1982) demonstrates that a policy conflict between the home and foreign countries arises only in the second case (domestic goods for savings). However, his result depends on the relative size of various elasticities. For example, if the home country's import-income elasticity is sufficiently large and the import-price elasticities are relatively low, then a policy conflict could arise in case 1 and not exist in case 2. While such outcomes are possible, our simulations do not support this scenario.

5/ In the prototype MCM country, all of the aggregates and rates that are fixed are endogenous variables. In order to allow policy makers to completely control the relevant variables, it was necessary to modify the MCM. In order to fix either the exchange rate or the level of international reserves, the behavioral equation depicting central bank intervention was dropped from the model. In the case of fixed exchange rates, this allowed policy makers to intervene as much as necessary in order to reach their exchange rate target. The interest rate on monetary aggregate targets were achieved by allowing the authorities to intervene in the domestic security market. However, owing to peculiarities in the U.K. monetary sector, the discount rate, rather than open market operations, was used as the endogenous policy instrument.

Open market operations are not explicitly modelled in the U.K. monetary sector, the use of the discount rate provides a reasonable "as if" story.

6/ In addition, tax receipts in the U.K. are positively related to official financing. In this simulation, the loss of reserves decreases taxes, increases disposable income and causes consumption to rise.

7/ If the positive elasticity of broadly defined money is sufficiently large, it is possible that the model would be unstable. Specifically, this will be the case if the MM line has more interest elasticity than the XX line.

8/ This implicitly assumes that the demand for broad money while positive, is relatively interest inelastic. If it is very elastic, interest rates will fall and output will rise in the face of an expansionary shock. But the basic point remains: interest rates and output are inversley related.

9/ For technical reasons the real-side shocks were scaled differently. With M2 exogenous, the necessary interest rate changes for the real side shocks were so large the model failed to solve.

10/ While the differences can be pronounced, they are not totally unexpected. See Haas and Symansky IFDP #214.

Bibliography

Bryant, Ralph C., Money and Monetary Policy in Interdependent Nations, Brookings, Washington, D.C., 1980.

Haas, Richard and Steven Symansky, "Assessing Dynamic Properties of the MCM: A Simulation Approach," International Finance Discussion Paper, No. 214, Federal Reserve Board, Washington, D.C., 1983.

Henderson, Dale W., "The Role of Intervention Policy in Open Economy Financial Policy: A Macroeconomic Perspective," International Finance Discussion Paper, No. 202. Federal Reserve Board, Washington, D.C., February 1982. Forthcoming in Lombra and Witte, editors, The Political Economy of Domestic and International Monetary Relations Ames, Iowa State University Press, 1982.

Hooper, Peter, Richard Haas, Steven Symansky, and Lois Stekler, "Alternative Approaches to General Equilibrium Modeling of Exchange Rates and Capital Flows: The MCM Experience, Zeitschrift fur Nationaloleonomic, 1983.

Jonson, P.D., and R.G. Trevor, "Monetary Rules: A Preliminary Analysis," The Economic Record, Vol. 57, No. 157, 1981.

Poole, William "Optimal Choice of Monetary Policy Instruments in a Simple Stochastic Macro Model, "Quarterly Journal of Economics, vol. 84, 1970.

Quantitative Studies, "FRB Multicountry Model," Federal Reserve Board, Washington, D.C., 1983.

Stevens, Guy V.G., et. al., U.S. Economy in an Interdependent World: A Multicountry Model, Federal Reserve Board, Washington, D.C. 1984.

GROSS NATIONAL PRODUCT

FOREIGN GOODS/DOMESTIC GOODS SHOCKS

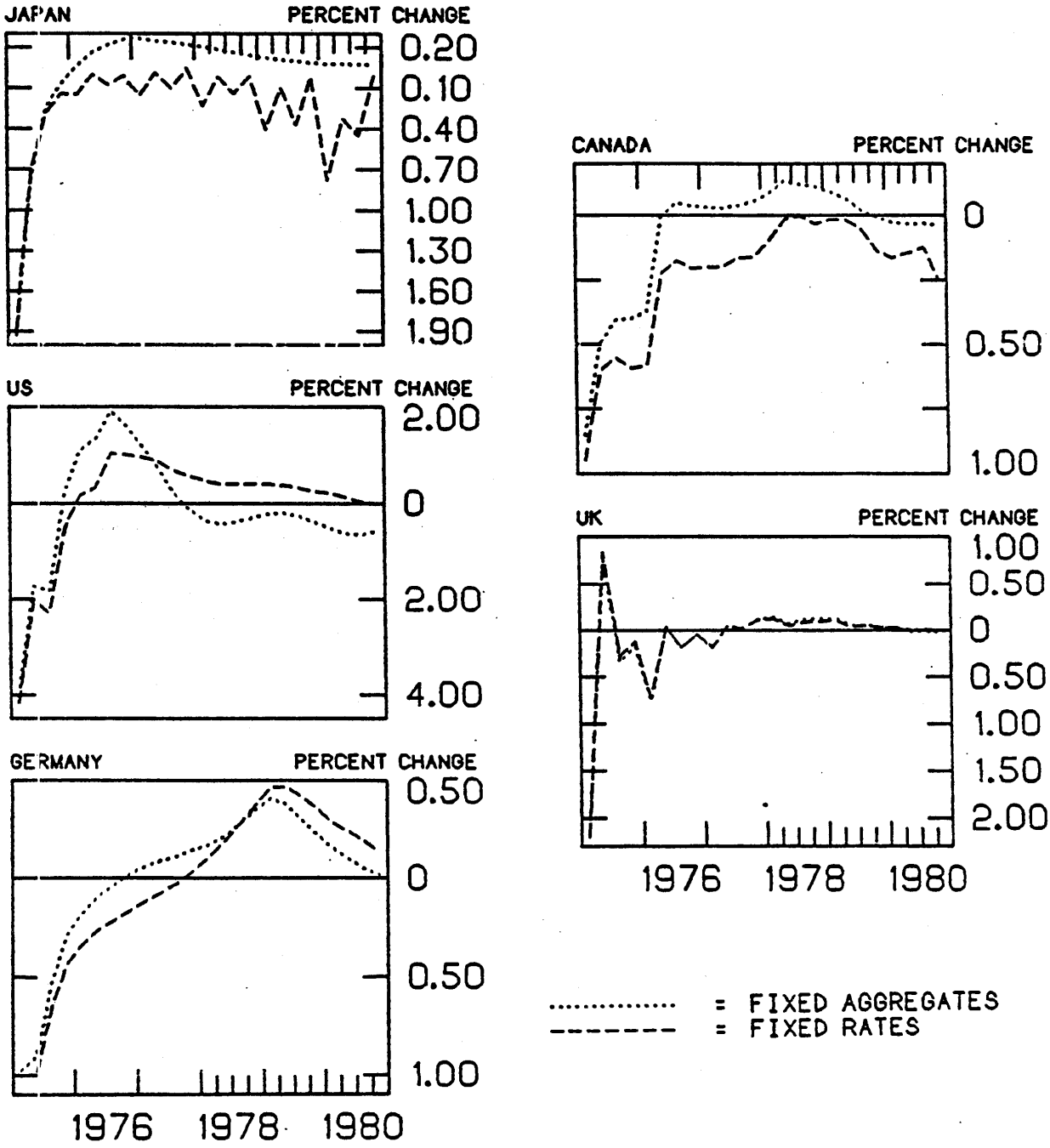


FIGURE 3

FOREIGN GNP

FOREIGN GOODS/DOMESTIC GOODS SHOCKS

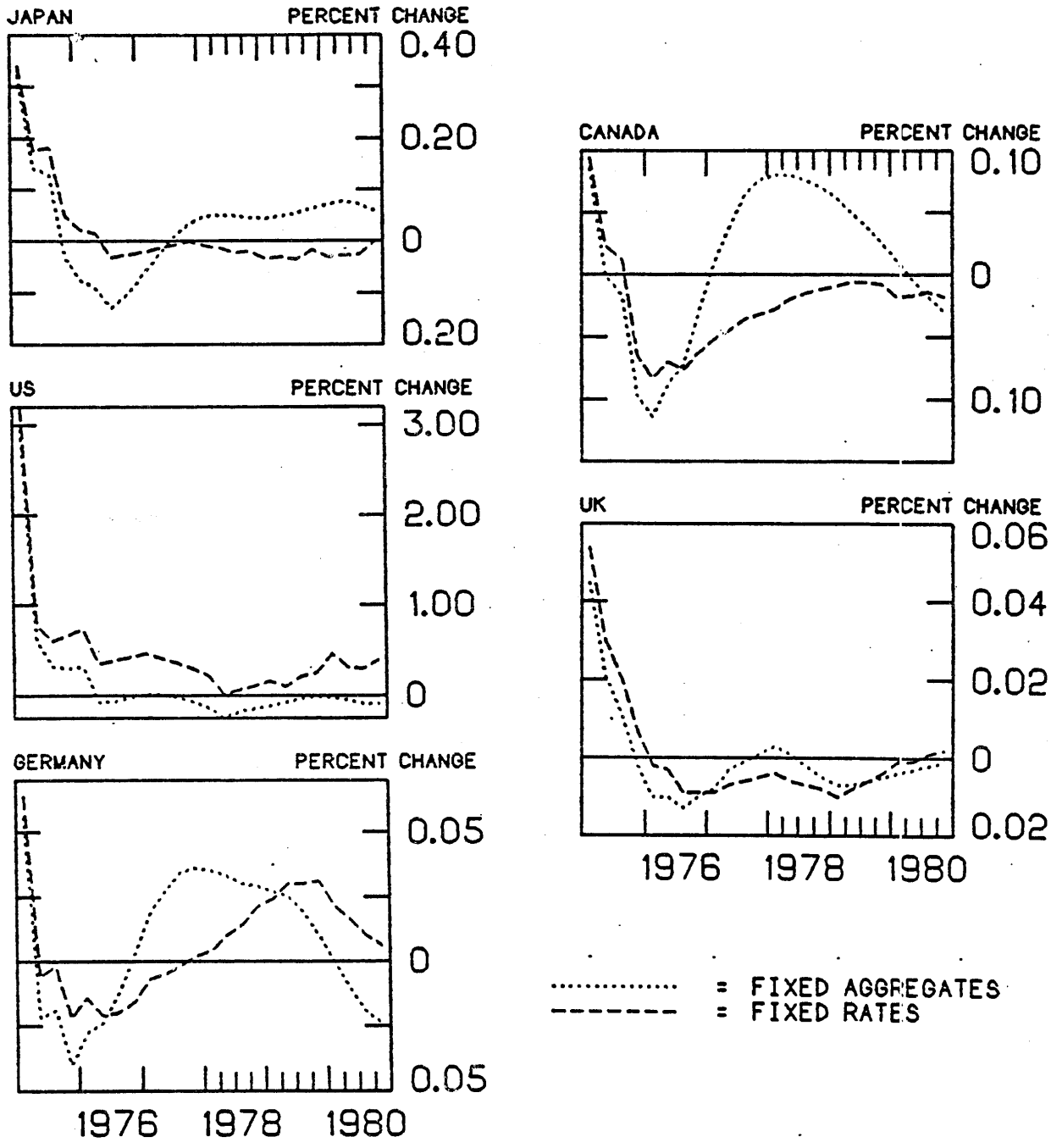


FIGURE 4

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- GNP (PCER)

TABLE

			JAPAN		US		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	-1.929	-1.895	-4.031	-4.171	-0.979	-1.005	-0.854	-0.949	-2.209	-2.188
*	75	2	-0.764	-0.711	-1.711	-2.018	-0.906	-0.993	-0.5	-0.606	0.762	0.841
*	75	3	-0.235	-0.273	-1.819	-2.29	-0.528	-0.652	-0.405	-0.553	-0.342	-0.28
*	75	4	-0.065	-0.144	0.199	-0.518	-0.283	-0.431	-0.402	-0.594	-0.175	-0.125
*	76	1	0.064	-0.145	1.08	0.159	-0.176	-0.334	-0.374	-0.583	-0.751	-0.728
*	76	2	0.162	0.	1.312	0.32	-0.091	-0.26	-0.006	-0.224	0.03	0.042
*	76	3	0.219	-0.076	1.91	1.033	-0.035	-0.213	0.049	-0.175	-0.19	-0.191
*	76	4	0.258	-0.009	1.612	1.014	0.02	-0.165	0.037	-0.207	-0.051	-0.041
*	77	1	0.265	-0.152	1.195	0.964	0.059	-0.118	0.031	-0.201	-0.188	-0.183
*	77	2	0.247	0.017	0.746	0.888	0.09	-0.075	0.026	-0.2	0.04	0.049
*	77	3	0.237	-0.098	0.223	0.678	0.111	-0.029	0.038	-0.164	0.02	0.012
*	77	4	0.221	0.048	-0.118	0.576	0.144	0.034	0.053	-0.163	0.114	0.106
*	78	1	0.205	-0.231	-0.348	0.475	0.168	0.102	0.083	-0.096	0.136	0.121
*	78	2	0.185	-0.013	-0.432	0.397	0.21	0.183	0.133	-0.016	0.065	0.041
*	78	3	0.166	-0.14	-0.383	0.4	0.272	0.273	0.12	-0.001	0.117	0.083
*	78	4	0.144	-0.009	-0.296	0.398	0.345	0.371	0.112	-0.034	0.12	0.091
*	79	1	0.125	-0.404	-0.224	0.397	0.408	0.465	0.09	-0.016	0.125	0.103
*	79	2	0.112	-0.096	-0.2	0.377	0.377	0.466	0.063	-0.018	0.048	0.033
*	79	3	0.099	-0.367	-0.259	0.326	0.301	0.42	0.018	-0.056	0.055	0.049
*	79	4	0.089	-0.008	-0.384	0.256	0.225	0.358	-0.007	-0.138	0.027	0.031
*	80	1	0.079	-0.781	-0.507	0.216	0.153	0.285	-0.027	-0.164	0.019	0.032
*	80	2	0.079	-0.32	-0.619	0.134	0.1	0.239	-0.033	-0.146	-0.019	-0.
*	80	3	0.075	-0.449	-0.65	0.041	0.05	0.194	-0.031	-0.124	-0.014	0.006
*	80	4	0.072	-0.008	-0.581	-0.018	0.016	0.133	-0.037	-0.253	-0.028	-0.009

TABLE 1

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- FGNP (PCER)

TABLE

			JAPAN		US		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.323	0.341	2.954	3.194	0.056	0.064	0.086	0.095	0.045	0.054
*	75	2	0.141	0.176	0.619	0.785	-0.022	-0.006	-0.	0.023	0.021	0.03
*	75	3	0.13	0.182	0.319	0.599	-0.019	-0.002	-0.016	0.012	0.011	0.02
*	75	4	-0.03	0.05	0.293	0.66	-0.04	-0.022	-0.097	-0.065	-0.002	0.007
*	76	1	-0.075	0.022	0.313	0.733	-0.028	-0.014	-0.114	-0.083	-0.01	-0.002
*	76	2	-0.092	0.015	-0.075	0.345	-0.024	-0.021	-0.088	-0.07	-0.01	-0.003
*	76	3	-0.129	-0.032	-0.069	0.378	-0.013	-0.02	-0.072	-0.076	-0.013	-0.009
*	76	4	-0.103	-0.026	-0.022	0.421	0.002	-0.016	-0.03	-0.063	-0.01	-0.009
*	77	1	-0.064	-0.022	0.016	0.46	0.018	-0.007	0.009	-0.052	-0.008	-0.009
*	77	2	-0.027	-0.014	0.011	0.408	0.027	-0.005	0.038	-0.045	-0.003	-0.007
*	77	3	0.008	-0.008	-0.02	0.354	0.034	-0.002	0.064	-0.036	-0.	-0.006
*	77	4	0.033	-0.001	-0.069	0.295	0.036	0.002	0.076	-0.032	0.001	-0.005
*	78	1	0.048	-0.009	-0.138	0.216	0.035	0.004	0.08	-0.028	0.003	-0.004
*	78	2	0.05	-0.014	-0.249	0.011	0.033	0.01	0.08	-0.02	0.	-0.006
*	78	3	0.049	-0.022	-0.18	0.064	0.03	0.014	0.076	-0.015	-0.002	-0.007
*	78	4	0.045	-0.02	-0.149	0.099	0.029	0.021	0.07	-0.012	-0.005	-0.008
*	79	1	0.044	-0.034	-0.116	0.16	0.027	0.024	0.061	-0.009	-0.007	-0.01
*	79	2	0.048	-0.031	-0.08	0.096	0.025	0.03	0.049	-0.006	-0.007	-0.008
*	79	3	0.054	-0.035	-0.032	0.204	0.019	0.03	0.038	-0.006	-0.006	-0.006
*	79	4	0.063	-0.017	-0.019	0.246	0.01	0.031	0.025	-0.008	-0.005	-0.004
*	80	1	0.071	-0.031	-0.023	0.461	-0.001	0.021	0.011	-0.018	-0.004	-0.001
*	80	2	0.077	-0.027	-0.056	0.309	-0.011	0.016	-0.004	-0.017	-0.003	-0.
*	80	3	0.071	-0.026	-0.089	0.293	-0.02	0.01	-0.018	-0.014	-0.002	0.001
*	80	4	0.059	-0.001	-0.088	0.389	-0.024	0.006	-0.03	-0.018	-0.001	0.002

TABLE 2

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- RS (ER)

			JAPAN		US		GERMANY		CANADA		UK	
TABL.			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	-2.783	0.	-0.61	0.	-0.247	0.	-0.677	0.	-1.219	0.087
*	75	2	-1.093	0.	-0.793	0.	-0.436	0.	-0.311	0.	-0.285	0.138
*	75	3	-0.421	0.	-1.187	0.	-0.173	0.	-0.314	0.	-0.078	0.163
*	75	4	0.078	0.	-0.928	0.	-0.072	0.	-0.305	0.	0.151	0.15
*	76	1	0.17	0.	-0.541	0.	-0.015	0.	-0.277	0.	-0.195	0.14
*	76	2	0.213	0.	-0.256	0.	0.008	0.	-0.05	0.	0.12	0.144
*	76	3	0.249	0.	0.143	0.	0.018	0.	-0.042	0.	0.133	0.138
*	76	4	0.266	0.	0.42	0.	0.016	0.	-0.05	0.	0.296	0.127
*	77	1	0.257	0.	0.654	0.	0.004	0.	-0.039	0.	0.108	0.116
*	77	2	0.195	0.	0.794	0.	-0.007	0.	-0.044	0.	0.142	0.108
*	77	3	0.184	0.	0.825	0.	-0.014	0.	-0.034	0.	0.098	0.096
*	77	4	0.171	0.	0.675	0.	-0.015	0.	-0.012	0.	0.066	0.089
*	78	1	0.157	0.	0.426	0.	-0.01	0.	0.027	0.	-0.007	0.082
*	78	2	0.124	0.	0.176	0.	-0.004	0.	0.064	0.	-0.016	0.074
*	78	3	0.119	0.	0.005	0.	0.017	0.	0.051	0.	0.011	0.072
*	78	4	0.123	0.	-0.084	0.	0.049	0.	0.054	0.	0.041	0.069
*	79	1	0.114	0.	-0.094	0.	0.066	0.	0.062	0.	0.035	0.066
*	79	2	0.109	0.	-0.062	0.	0.078	0.	0.046	0.	0.015	0.063
*	79	3	0.128	0.	-0.044	0.	0.07	0.	0.004	0.	0.024	0.063
*	79	4	0.151	0.	-0.092	0.	0.06	0.	0.001	0.	0.031	0.062
*	80	1	0.17	0.	-0.205	0.	0.033	0.	0.013	0.	0.029	0.061
*	80	2	0.174	0.	-0.257	0.	0.022	0.	-0.002	0.	0.003	0.058
*	80	3	0.157	0.	-0.344	0.	0.016	0.	-0.026	0.	-0.008	0.056
*	80	4	0.143	0.	-0.602	0.	0.019	0.	-0.021	0.	-0.022	0.053

TABLE 3

FOREIGN GOODS/SAVINGS SHOCK --- ER (PCER)

TABLE

			JAPAN		US		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	-1.543	0.	-3.106	0.	-0.704	0.	-0.757	0.	-0.655	0.
*	75	2	-1.67	0.	-3.218	0.	-1.173	0.	-0.986	0.	-0.23	0.
*	75	3	-1.615	0.	-3.336	0.	-0.916	0.	-0.953	0.	-0.128	0.
*	75	4	-1.733	0.	-2.831	0.	-0.76	0.	-0.822	0.	-0.069	0.
*	76	1	-1.885	0.	-2.437	0.	-0.617	0.	-0.668	0.	-0.132	0.
*	76	2	-1.587	0.	-1.679	0.	-0.452	0.	-0.417	0.	-0.074	0.
*	76	3	-1.364	0.	-1.066	0.	-0.328	0.	-0.225	0.	-0.053	0.
*	76	4	-1.093	0.	-0.841	0.	-0.268	0.	-0.127	0.	0.012	0.
*	77	1	-1.062	0.	-0.617	0.	-0.251	0.	-0.081	0.	-0.008	0.
*	77	2	-0.96	0.	-0.595	0.	-0.259	0.	-0.068	0.	-0.001	0.
*	77	3	-0.885	0.	-0.646	0.	-0.276	0.	-0.065	0.	-0.015	0.
*	77	4	-0.786	0.	-0.743	0.	-0.297	0.	-0.059	0.	-0.03	0.
*	78	1	-0.78	0.	-0.86	0.	-0.322	0.	-0.043	0.	-0.045	0.
*	78	2	-0.744	0.	-0.839	0.001	-0.344	0.	-0.021	0.	-0.045	0.
*	78	3	-0.697	0.	-0.789	0.001	-0.352	0.	-0.027	0.	-0.045	0.
*	78	4	-0.646	0.	-0.689	0.001	-0.355	0.	-0.048	0.	-0.05	0.
*	79	1	-0.619	0.	-0.483	0.001	-0.394	0.	-0.065	0.	-0.057	0.
*	79	2	-0.561	0.	-0.224	0.001	-0.445	0.	-0.086	0.	-0.058	0.
*	79	3	-0.486	0.	-0.076	0.001	-0.507	0.	-0.124	0.	-0.053	0.
*	79	4	-0.424	0.	0.015	0.001	-0.569	0.	-0.153	0.	-0.048	0.
*	80	1	-0.386	0.	0.137	0.001	-0.637	0.	-0.154	0.	-0.045	0.
*	80	2	-0.336	0.	0.313	0.002	-0.677	0.	-0.141	0.	-0.044	0.
*	80	3	-0.277	0.	0.333	0.002	-0.682	0.	-0.137	0.	-0.041	0.
*	80	4	-0.238	0.	0.171	0.002	-0.639	0.	-0.12	0.	-0.038	0.

TABLE 4

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- M1 (PCER)

TABLE

			JAPAN		US		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.	-1.249	0.	-0.387	0.	-0.114	0.	-0.86	0.	-0.839
*	75	2	0.	-0.624	0.	-0.572	0.	-0.247	0.	-0.897	0.	-0.456
*	75	3	0.	-0.317	0.	-0.813	0.	-0.244	0.	-1.099	0.	-0.332
*	75	4	0.	-0.097	0.	-0.847	0.	-0.216	0.	-1.202	0.	-0.185
*	76	1	0.	-0.11	0.	-0.809	0.	-0.199	0.	-1.269	0.	-0.417
*	76	2	0.	-0.054	0.	-0.74	0.	-0.179	0.	-1.156	0.	-0.264
*	76	3	0.	-0.072	0.	-0.574	0.	-0.167	0.	-1.131	0.	-0.242
*	76	4	0.	-0.029	0.	-0.396	0.	-0.154	0.	-1.109	0.	-0.145
*	77	1	0.	-0.066	0.	-0.199	0.	-0.158	0.	-1.03	0.	-0.178
*	77	2	0.	-0.02	0.	-0.04	0.	-0.161	0.	-1.026	0.	-0.117
*	77	3	0.	-0.033	0.	0.056	0.	-0.16	0.	-1.021	0.	-0.087
*	77	4	0.	0.013	0.	0.094	0.	-0.152	0.	-0.931	0.	-0.037
*	78	1	0.	-0.081	0.	0.112	0.	-0.147	0.	-0.783	0.	-0.002
*	78	2	0.	-0.01	0.	0.11	0.	-0.136	0.	-0.669	0.	-0.001
*	78	3	0.	-0.081	0.	0.1	0.	-0.117	0.	-0.583	0.	-0.003
*	78	4	0.	-0.005	0.	0.093	0.	-0.087	0.	-0.516	0.	0.003
*	79	1	0.	-0.103	0.	0.093	0.	-0.065	0.	-0.421	0.	0.012
*	79	2	0.	0.016	0.	0.097	0.	-0.051	0.	-0.373	0.	-0.01
*	79	3	0.	-0.032	0.	0.102	0.	-0.046	0.	-0.386	0.	-0.019
*	79	4	0.	0.148	0.	0.104	0.	-0.043	0.	-0.436	0.	-0.028
*	80	1	0.	0.057	0.	0.105	0.	-0.066	0.	-0.435	0.	-0.031
*	80	2	0.	0.09	0.	0.101	0.	-0.108	0.	-0.447	0.	-0.045
*	80	3	0.	-0.068	0.	0.089	0.	-0.148	0.	-0.478	0.	-0.052
*	80	4	0.	0.082	0.	0.073	0.	-0.177	0.	-0.602	0.	-0.06

TABLE 5

TABLE 6

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- INTVEN (ER)

			JAPAN		GERMANY		CANADA		UK	
TABLE			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.	-0.481	0.	-17.253	0.	-5.103	0.	-2.536
*	75	2	0.	-0.537	0.	-23.705	0.	-1.908	0.	-0.928
*	75	3	0.	-0.515	0.	-18.36	0.	-1.538	0.	-0.354
*	75	4	0.	-0.647	0.	-14.613	0.	-1.444	0.	-0.08
*	76	1	0.	-0.734	0.	-12.898	0.	-1.192	0.	0.084
*	76	2	0.	-0.633	0.	-10.917	0.	-1.318	0.	0.036
*	76	3	0.	-0.551	0.	-8.586	0.	-1.345	0.	0.003
*	76	4	0.	-0.465	0.	-7.22	0.	-1.299	0.	0.102
*	77	1	0.	-0.508	0.	-6.287	0.	-1.176	0.	0.149
*	77	2	0.	-0.46	0.	-5.716	0.	-1.123	0.	0.14
*	77	3	0.	-0.438	0.	-5.088	0.	-1.109	0.	0.117
*	77	4	0.	-0.378	0.	-5.012	0.	-1.135	0.	0.021
*	78	1	0.	-0.335	0.	-5.751	0.	-1.128	0.	-0.037
*	78	2	0.	-0.271	0.	-6.79	0.	-1.262	0.	-0.056
*	78	3	0.	-0.222	0.	-8.457	0.	-1.389	0.	-0.08
*	78	4	0.	-0.109	0.	-10.837	0.	-1.61	0.	-0.126
*	79	1	0.	-0.117	0.	-14.333	0.	-1.704	0.	-0.17
*	79	2	0.	-0.086	0.	-18.037	0.	-1.893	0.	-0.182
*	79	3	0.	-0.063	0.	-21.341	0.	-2.079	0.	-0.197
*	79	4	0.	0.077	0.	-24.415	0.	-2.39	0.	-0.214
*	80	1	0.	0.069	0.	-27.181	0.	-2.596	0.	-0.229
*	80	2	0.	0.129	0.	-29.417	0.	-2.781	0.	-0.214
*	80	3	0.	0.244	0.	-30.874	0.	-2.948	0.	-0.2
*	80	4	0.	0.486	0.	-31.995	0.	-3.51	0.	-0.189

DOMESTIC GNP FOR THE FOUR PERIOD SAMPLE - FOREIGN SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.5402	-0.6755	-0.4912	-0.4379	-0.6739	-0.7704	-0.7484	-0.7556	-1.8405	-2.2493
VARIANCE	0.0457	0.0337	1.5482	1.6069	0.1072	0.0780	0.7086	0.6353	2.9924	2.2478
SQDEV	1.3044	1.9264	5.6097	5.5876	2.1382	2.6080	4.3662	4.1897	22.5273	26.9809
ABS	2.1608	2.7021	3.4885	3.4344	2.6956	3.0816	2.9937	3.0224	7.7602	8.9972

DOMESTIC GNP FOR THE EIGHT PERIOD SAMPLE - FOREIGN SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.3067	-0.4864	-0.3657	-0.3337	-0.3722	-0.5067	-0.2865	-0.4065	-0.1811	-0.8089
VARIANCE	0.0994	0.0711	0.7347	0.7524	0.1530	0.1151	0.5506	0.4135	4.4854	3.4243
SQDEV	1.4480	2.3901	6.2132	6.1580	2.1791	2.8595	4.5108	4.2166	31.6601	29.2043
ABS	2.6271	3.8911	4.5104	4.4373	3.0178	4.0533	3.6956	3.2523	13.6736	11.5234

DOMESTIC GNP FOR THE FULL PERIOD SAMPLE - FOREIGN SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.0758	-0.2367	-0.0954	-0.0877	0.0021	-0.0313	0.0045	-0.2610	-0.1786	0.0014
VARIANCE	0.0602	0.0583	0.2661	0.2638	0.1293	0.1759	0.2148	0.1701	1.5301	1.4328
SQDEV	1.5221	2.6848	6.3383	6.2529	2.9746	4.0693	4.9406	5.5472	35.9568	32.9534
ABS	3.5308	5.6803	5.6496	5.3858	6.0454	7.7984	6.0958	6.3947	20.8405	18.0646

TABLE 7

FOREIGN GNP FOR THE FOUR PERIOD SAMPLE - FOREIGN SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.0066	0.0164	0.0188	0.0279	-0.0061	0.0085	0.1412	0.1874	1.0462	1.3095
VARIANCE	0.0056	0.0043	0.0004	0.0004	0.0018	0.0014	0.0208	0.0142	1.6395	1.5842
SQDEV	0.0170	0.0139	0.0026	0.0043	0.0056	0.0046	0.1421	0.1832	9.2967	11.6121
ABS	0.1986	0.1949	0.0790	0.1116	0.1365	0.0938	0.6243	0.7498	4.1848	5.2381

FOREIGN GNP FOR THE EIGHT PERIOD SAMPLE - FOREIGN SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.0412	-0.0284	0.0040	0.0111	-0.0109	-0.0045	0.0206	0.0910	0.5413	0.8894
VARIANCE	0.0043	0.0042	0.0004	0.0005	0.0009	0.0008	0.0257	0.0171	1.0087	0.8943
SQDEV	0.0437	0.0355	0.0031	0.0044	0.0071	0.0059	0.1835	0.1856	9.4054	12.5882
ABS	0.5021	0.4877	0.1224	0.1346	0.2031	0.1641	1.0237	0.8439	4.6643	7.1150

FOREIGN GNP FOR THE FULL PERIOD SAMPLE - FOREIGN SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	0.0123	-0.0234	-0.0008	0.0004	0.0074	0.0069	0.0330	0.0173	0.1271	0.4659
VARIANCE	0.0037	0.0014	0.0001	0.0002	0.0007	0.0004	0.0088	0.0081	0.4000	0.3788
SQDEV	0.0880	0.0454	0.0034	0.0050	0.0175	0.0108	0.2292	0.1935	9.5870	13.9214
ABS	1.2297	0.8223	0.1810	0.2187	0.5804	0.3964	1.8341	1.1563	6.0003	11.1808

TABLE 8

GROSS NATIONAL PRODUCT

DOMESTIC GOODS/SAVINGS SHOCKS

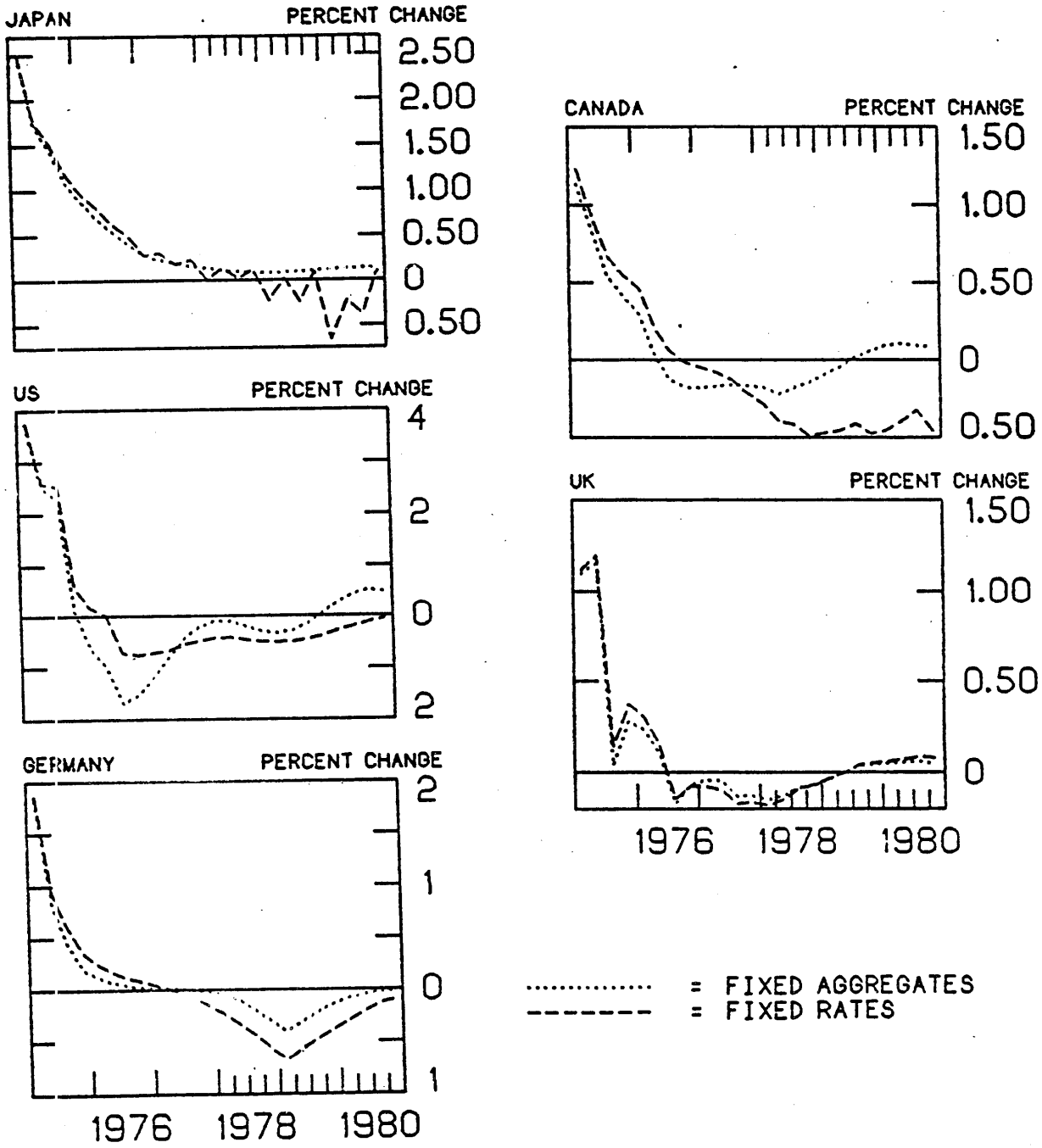


FIGURE 5

FOREIGN GNP

DOMESTIC GOODS/SAVINGS SHOCKS

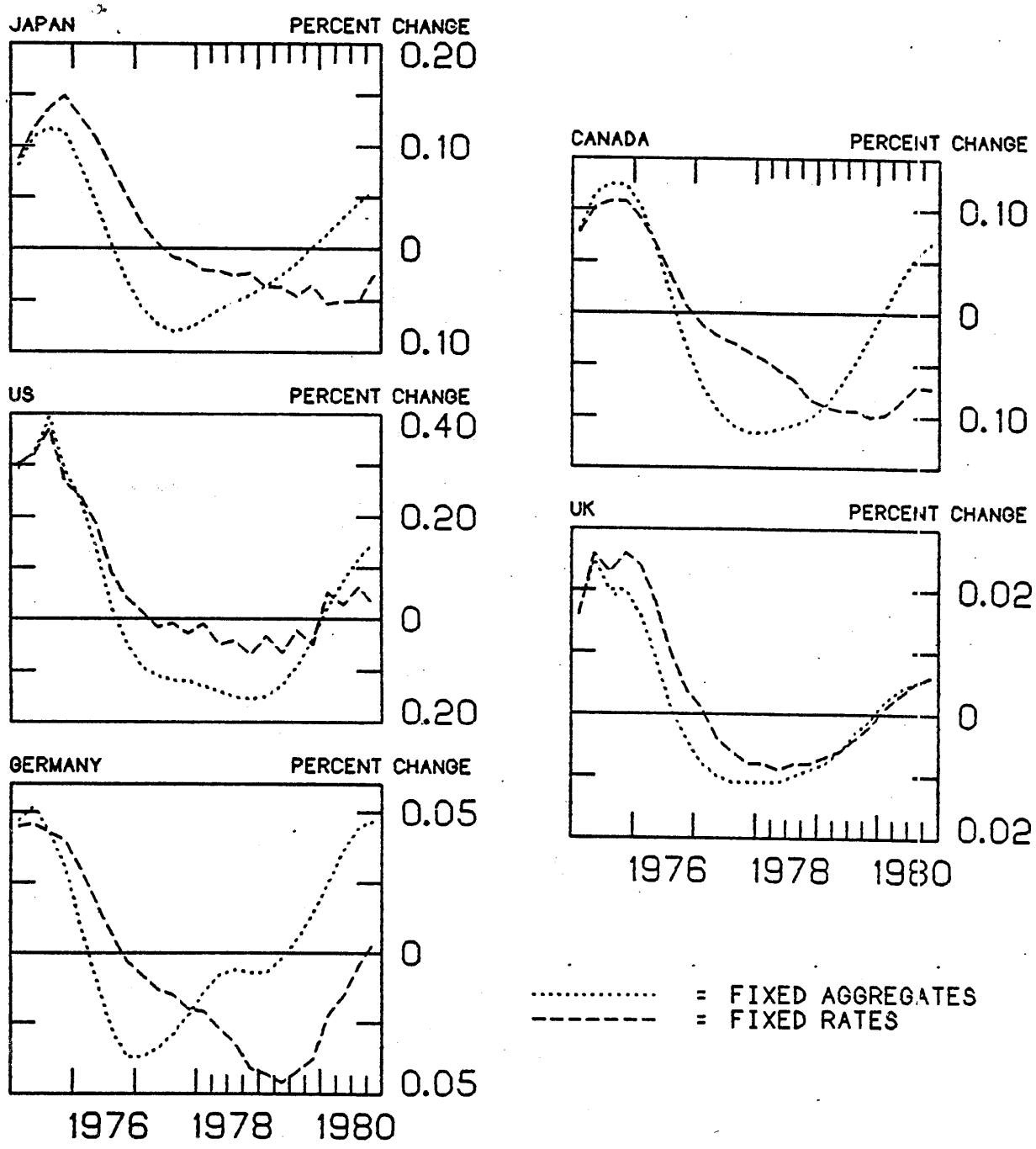


FIGURE 6

DOMESTIC GOODS/SAVINGS SHOCK --- GNP (PCER)

			JAPAN		US		GERMANY		CANADA		UK	
TABLE			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	2.507	2.509	3.747	3.763	1.839	1.867	1.141	1.235	1.096	1.115
*	75	2	1.718	1.754	2.521	2.591	0.829	0.941	0.834	0.932	1.155	1.198
*	75	3	1.444	1.516	2.285	2.526	0.44	0.6	0.538	0.666	0.04	0.143
*	75	4	1.081	1.183	0.084	0.599	0.193	0.358	0.408	0.546	0.281	0.374
*	76	1	0.878	0.961	-0.645	0.157	0.118	0.24	0.294	0.46	0.23	0.302
*	76	2	0.685	0.807	-0.978	0.015	0.068	0.163	0.024	0.209	0.104	0.154
*	76	3	0.54	0.624	-1.695	-0.71	0.035	0.113	-0.13	0.057	-0.17	-0.145
*	76	4	0.4	0.492	-1.532	-0.76	0.022	0.072	-0.179	-0.021	-0.068	-0.075
*	77	1	0.281	0.275	-1.181	-0.719	0.016	0.032	-0.182	-0.052	-0.043	-0.077
*	77	2	0.231	0.305	-0.796	-0.668	0.013	-0.015	-0.172	-0.086	-0.045	-0.097
*	77	3	0.194	0.18	-0.429	-0.544	-0.002	-0.074	-0.163	-0.129	-0.131	-0.172
*	77	4	0.159	0.232	-0.211	-0.486	-0.02	-0.15	-0.167	-0.217	-0.127	-0.163
*	78	1	0.137	0.01	-0.093	-0.425	-0.048	-0.232	-0.18	-0.284	-0.149	-0.18
*	78	2	0.115	0.137	-0.104	-0.417	-0.101	-0.331	-0.223	-0.399	-0.129	-0.149
*	78	3	0.098	0.02	-0.201	-0.461	-0.197	-0.442	-0.183	-0.414	-0.084	-0.091
*	78	4	0.086	0.118	-0.296	-0.496	-0.301	-0.563	-0.148	-0.493	-0.071	-0.069
*	79	1	0.082	-0.223	-0.332	-0.51	-0.403	-0.668	-0.097	-0.47	-0.037	-0.035
*	79	2	0.09	0.026	-0.285	-0.5	-0.308	-0.574	-0.047	-0.455	-0.001	-0.001
*	79	3	0.027	-0.238	-0.148	-0.451	-0.219	-0.482	0.016	-0.412	0.037	0.041
*	79	4	0.109	0.097	0.061	-0.381	-0.142	-0.388	0.056	-0.477	0.043	0.05
*	80	1	0.117	-0.663	0.265	-0.285	-0.084	-0.306	0.094	-0.456	0.049	0.06
*	80	2	0.128	-0.221	0.447	-0.202	-0.05	-0.212	0.104	-0.397	0.056	0.071
*	80	3	0.13	-0.375	0.53	-0.116	-0.025	-0.13	0.092	-0.326	0.06	0.086
*	80	4	0.137	0.108	0.486	-0.056	-0.012	-0.096	0.088	-0.457	0.045	0.08

TABLE 9

DOMESTIC GOODS/SAVINGS SHOCK --- FGNP (PCER)

			JAPAN		US		GERMANY		CANADA		UK	
TABLE			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.081	0.087	0.293	0.303	0.047	0.045	0.08	0.078	0.016	0.016
*	75	2	0.108	0.117	0.323	0.32	0.052	0.046	0.115	0.102	0.025	0.026
*	75	3	0.117	0.137	0.394	0.372	0.043	0.043	0.125	0.108	0.02	0.023
*	75	4	0.114	0.149	0.291	0.269	0.031	0.04	0.124	0.108	0.02	0.026
*	76	1	0.081	0.129	0.234	0.24	0.01	0.03	0.102	0.09	0.016	0.024
*	76	2	0.045	0.108	0.14	0.186	-0.009	0.018	0.062	0.065	0.009	0.018
*	76	3	0.005	0.079	0.024	0.09	-0.027	0.007	0.013	0.035	0.001	0.01
*	76	4	-0.031	0.051	-0.048	0.041	-0.037	-0.003	-0.035	0.006	-0.004	0.004
*	77	1	-0.057	0.023	-0.094	0.014	-0.037	-0.008	-0.071	-0.012	-0.008	0.
*	77	2	-0.073	0.005	-0.11	-0.016	-0.034	-0.013	-0.095	-0.022	-0.01	-0.004
*	77	3	-0.08	-0.008	-0.119	-0.008	-0.029	-0.015	-0.109	-0.029	-0.011	-0.006
*	77	4	-0.077	-0.012	-0.12	-0.029	-0.022	-0.02	-0.116	-0.038	-0.011	-0.008
*	78	1	-0.069	-0.021	-0.13	-0.009	-0.014	-0.021	-0.116	-0.045	-0.011	-0.008
*	78	2	-0.059	-0.022	-0.14	-0.05	-0.008	-0.027	-0.112	-0.055	-0.011	-0.009
*	78	3	-0.052	-0.026	-0.151	-0.042	-0.006	-0.032	-0.108	-0.064	-0.01	-0.008
*	78	4	-0.045	-0.024	-0.155	-0.069	-0.007	-0.041	-0.102	-0.083	-0.009	-0.008
*	79	1	-0.036	-0.037	-0.15	-0.033	-0.007	-0.043	-0.089	-0.09	-0.008	-0.007
*	79	2	-0.026	-0.037	-0.128	-0.066	-0.002	-0.046	-0.069	-0.094	-0.006	-0.006
*	79	3	-0.014	-0.046	-0.09	-0.022	0.005	-0.042	-0.047	-0.094	-0.003	-0.004
*	79	4	0.	-0.035	-0.039	-0.05	0.014	-0.038	-0.021	-0.1	-0.001	-0.002
*	80	1	0.014	-0.053	0.023	0.052	0.025	-0.022	0.005	-0.098	0.002	0.001
*	80	2	0.03	-0.051	0.075	0.028	0.037	-0.015	0.032	-0.085	0.004	0.003
*	80	3	0.044	-0.051	0.119	0.063	0.045	-0.004	0.055	-0.071	0.005	0.005
*	80	4	0.056	-0.025	0.149	0.03	0.047	0.004	0.068	-0.072	0.006	0.006

TABLE 10

DOMESTIC GOODS/SAVINGS SHOCK --- RS (ER)

TABLE			JAPAN		US		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	3.223	0.	0.792	0.	0.285	0.	0.787	0.	1.213	-0.02
*	75	2	2.006	0.	1.218	0.	0.812	0.	0.673	0.	0.624	-0.001
*	75	3	1.745	0.	1.911	0.	0.316	0.	0.622	0.	0.069	-0.002
*	75	4	1.157	0.	1.53	0.	0.032	0.	0.458	0.	-0.227	0.012
*	76	1	0.966	0.	0.959	0.	-0.333	0.	0.35	0.	-0.189	0.023
*	76	2	0.853	0.	0.597	0.	-0.121	0.	0.222	0.	-0.12	0.031
*	76	3	0.842	0.	0.156	0.	-0.046	0.	0.133	0.	-0.353	0.036
*	76	4	0.749	0.	-0.146	0.	-0.015	0.	0.048	0.	-0.364	0.047
*	77	1	0.689	0.	-0.387	0.	0.023	0.	-0.009	0.	-0.202	0.056
*	77	2	0.559	0.	-0.502	0.	0.047	0.	-0.021	0.	-0.085	0.058
*	77	3	0.548	0.	-0.542	0.	0.076	0.	-0.019	0.	-0.053	0.056
*	77	4	0.486	0.	-0.472	0.	0.071	0.	-0.064	0.	0.003	0.055
*	78	1	0.466	0.	-0.36	0.	0.066	0.	-0.113	0.	0.083	0.054
*	78	2	0.406	0.	-0.202	0.	0.054	0.	-0.157	0.	0.103	0.052
*	78	3	0.404	0.	-0.095	0.	0.031	0.	-0.124	0.	0.057	0.05
*	78	4	0.429	0.	-0.059	0.	-0.011	0.	-0.118	0.	0.007	0.047
*	79	1	0.434	0.	-0.087	0.	-0.042	0.	-0.112	0.	-0.011	0.042
*	79	2	0.49	0.	-0.13	0.	-0.041	0.	-0.077	0.	-0.009	0.039
*	79	3	0.608	0.	-0.139	0.	-0.004	0.	-0.004	0.	-0.02	0.038
*	79	4	0.716	0.	-0.083	0.	0.012	0.	0.016	0.	-0.028	0.037
*	80	1	0.917	0.	0.091	0.	0.041	0.	0.001	0.	-0.019	0.036
*	80	2	1.098	0.	0.247	0.	0.051	0.	0.017	0.	0.011	0.039
*	80	3	1.015	0.	0.405	0.	0.05	0.	0.06	0.	0.045	0.043
*	80	4	0.878	0.	0.772	0.	0.039	0.	0.056	0.	0.065	0.047

TABLE 11

DOMESTIC GOODS/SAVINGS SHOCK --- ER (PCER)

TABLE

			JAPAN		US		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.422	0.	0.021	0.	0.144	0.	0.43	0.	0.2	0.
*	75	2	-0.001	0.	0.024	0.	0.541	0.	0.709	0.	-0.023	0.
*	75	3	-0.203	0.	0.176	0.	-0.026	0.	0.788	0.	-0.139	0.
*	75	4	-0.54	0.	0.061	0.	-0.439	0.	0.654	0.	-0.141	0.
*	76	1	-0.67	0.	-0.343	0.	-0.944	0.	0.427	0.	-0.137	0.
*	76	2	-0.344	0.	-0.617	0.	-0.91	0.	0.18	0.	-0.11	0.
*	76	3	-0.881	0.	-0.862	0.	-0.917	0.	-0.029	0.	-0.173	0.
*	76	4	-0.957	0.	-0.94	0.	-0.854	0.	-0.194	0.	-0.173	0.
*	77	1	-0.946	0.	-0.876	0.	-0.742	0.	-0.313	0.	-0.125	0.
*	77	2	-0.971	0.	-0.708	0.	-0.635	0.	-0.374	0.	-0.074	0.
*	77	3	-0.941	0.	-0.417	0.	-0.552	0.	-0.383	0.	-0.051	0.
*	77	4	-0.929	0.	-0.084	0.	-0.495	0.	-0.388	0.	-0.045	0.
*	78	1	-0.893	0.	0.247	0.	-0.455	0.	-0.407	0.	-0.025	0.
*	78	2	-0.866	0.	0.512	0.001	-0.436	0.	-0.428	0.	-0.021	0.
*	78	3	-0.827	0.	0.652	0.001	-0.419	0.	-0.403	0.	-0.031	0.
*	78	4	-0.795	0.	0.664	0.001	-0.395	0.	-0.35	0.	-0.039	0.
*	79	1	-0.752	0.	0.566	0.001	-0.333	0.	-0.294	0.	-0.04	0.
*	79	2	-0.707	0.	0.425	0.001	-0.246	0.	-0.225	0.	-0.046	0.
*	79	3	-0.657	0.	0.26	0.001	-0.137	0.	-0.126	0.	-0.065	0.
*	79	4	-0.616	0.	0.075	0.001	-0.051	0.	-0.041	0.	-0.079	0.
*	80	1	-0.548	0.	-0.08	0.001	0.038	0.	-0.007	0.	-0.095	0.
*	80	2	-0.497	0.	-0.226	0.002	0.084	0.	0.006	0.	-0.102	0.
*	80	3	-0.505	0.	-0.34	0.002	0.092	0.	0.031	0.	-0.105	0.
*	80	4	-0.525	0.	-0.286	0.002	0.075	0.	0.045	0.	-0.11	0.

TABLE 12

DOMESTIC GOODS/SAVINGS SHOCK --- M1 (PCER)

			JAPAN		US		GERMANY		CANADA		UK	
TABLE			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.	1.174	0.	0.429	0.	0.124	0.	1.037	0.	0.79
*	75	2	0.	0.879	0.	0.666	0.	0.388	0.	1.465	0.	0.76
*	75	3	0.	0.81	0.	0.913	0.	0.348	0.	1.837	0.	0.534
*	75	4	0.	0.683	0.	0.94	0.	0.234	0.	1.787	0.	0.315
*	76	1	0.	0.628	0.	0.917	0.	0.032	0.	1.708	0.	0.214
*	76	2	0.	0.589	0.	0.857	0.	0.	0.	1.673	0.	0.203
*	76	3	0.	0.536	0.	0.691	0.	-0.02	0.	1.557	0.	0.038
*	76	4	0.	0.492	0.	0.497	0.	-0.026	0.	1.302	0.	-0.026
*	77	1	0.	0.428	0.	0.274	0.	-0.04	0.	1.013	0.	-0.059
*	77	2	0.	0.448	0.	0.124	0.	-0.051	0.	0.81	0.	-0.068
*	77	3	0.	0.428	0.	0.029	0.	-0.046	0.	0.64	0.	-0.097
*	77	4	0.	0.439	0.	-0.017	0.	-0.055	0.	0.34	0.	-0.115
*	78	1	0.	0.37	0.	-0.06	0.	-0.066	0.	0.061	0.	-0.118
*	78	2	0.	0.426	0.	-0.064	0.	-0.096	0.	-0.25	0.	-0.103
*	78	3	0.	0.371	0.	-0.059	0.	-0.144	0.	-0.482	0.	-0.076
*	78	4	0.	0.426	0.	-0.059	0.	-0.163	0.	-0.705	0.	-0.049
*	79	1	0.	0.35	0.	-0.065	0.	-0.194	0.	-0.886	0.	-0.023
*	79	2	0.	0.46	0.	-0.074	0.	-0.254	0.	-1.111	0.	0.001
*	79	3	0.	0.414	0.	-0.082	0.	-0.283	0.	-1.233	0.	0.029
*	79	4	0.	0.58	0.	-0.084	0.	-0.239	0.	-1.388	0.	0.049
*	80	1	0.	0.504	0.	-0.079	0.	-0.262	0.	-1.503	0.	0.06
*	80	2	0.	0.558	0.	-0.068	0.	-0.356	0.	-1.587	0.	0.069
*	80	3	0.	0.398	0.	-0.05	0.	-0.406	0.	-1.545	0.	0.079
*	80	4	0.	0.562	0.	-0.027	0.	-0.372	0.	-1.604	0.	0.083

TABLE 13

DOMESTIC GOODS/SAVINGS SHOCK --- INTVEN (ER)

TABLE			JAPAN		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.	-0.052	0.	-6.743	0.	-0.999	0.	-0.188
*	75	2	0.	-0.131	0.	-15.756	0.	-1.335	0.	-0.449
*	75	3	0.	-0.162	0.	-20.712	0.	-1.433	0.	-0.446
*	75	4	0.	-0.201	0.	-24.174	0.	-1.679	0.	-0.34
*	76	1	0.	-0.22	0.	-24.734	0.	-1.918	0.	-0.398
*	76	2	0.	-0.253	0.	-26.213	0.	-2.017	0.	-0.374
*	76	3	0.	-0.271	0.	-27.953	0.	-2.047	0.	-0.372
*	76	4	0.	-0.282	0.	-28.042	0.	-2.188	0.	-0.333
*	77	1	0.	-0.292	0.	-27.965	0.	-2.306	0.	-0.276
*	77	2	0.	-0.29	0.	-27.926	0.	-2.45	0.	-0.176
*	77	3	0.	-0.295	0.	-28.009	0.	-2.517	0.	-0.104
*	77	4	0.	-0.283	0.	-27.233	0.	-2.657	0.	-0.078
*	78	1	0.	-0.269	0.	-25.603	0.	-2.666	0.	-0.042
*	78	2	0.	-0.247	0.	-23.771	0.	-2.638	0.	-0.04
*	78	3	0.	-0.236	0.	-21.333	0.	-2.638	0.	-0.053
*	78	4	0.	-0.184	0.	-17.88	0.	-2.754	0.	-0.06
*	79	1	0.	-0.185	0.	-13.32	0.	-2.725	0.	-0.061
*	79	2	0.	-0.175	0.	-8.965	0.	-2.803	0.	-0.102
*	79	3	0.	-0.172	0.	-5.443	0.	-2.862	0.	-0.172
*	79	4	0.	-0.096	0.	-2.285	0.	-3.143	0.	-0.239
*	80	1	0.	-0.101	0.	0.132	0.	-3.346	0.	-0.311
*	80	2	0.	-0.078	0.	1.94	0.	-3.43	0.	-0.377
*	80	3	0.	-0.025	0.	3.642	0.	-3.422	0.	-0.423
*	80	4	0.	0.125	0.	4.429	0.	-4.044	0.	-0.462

TABLE 14

DOMESTIC GNP FOR THE FOUR PERIOD SAMPLE - DOMESTIC SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	0.7301	0.8447	0.6429	0.7074	0.8253	0.9415	1.6875	1.7406	2.1590	2.3698
VARIANCE	0.1070	0.0938	0.3206	0.2787	0.5255	0.4378	0.3662	0.3170	2.3250	1.7171
SQDEV	2.4529	3.1352	2.6148	2.8376	4.3012	4.8587	12.4891	13.0694	25.6201	27.6154
ABS	2.9203	3.3787	2.5714	2.8295	3.3013	3.7658	6.7500	6.9623	8.6360	9.4792

DOMESTIC GNP FOR THE EIGHT PERIOD SAMPLE - DOMESTIC SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	0.3662	0.5103	0.3333	0.3832	0.4431	0.5442	1.1568	1.2309	0.4731	1.0225
VARIANCE	0.2166	0.1872	0.2604	0.2577	0.3930	0.3703	0.4968	0.4509	4.3462	2.9083
SQDEV	2.5891	3.3937	2.7119	2.9788	4.3215	4.9606	14.1823	15.2767	32.2146	28.7226
ABS	3.5482	4.1244	3.1429	3.5046	3.5447	4.3532	9.2542	9.8469	13.4869	11.1211

DOMESTIC GNP FOR THE FULL PERIOD SAMPLE - DOMESTIC SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	0.0757	-0.0601	0.0891	0.1008	0.0692	-0.0116	0.4769	0.4015	0.0624	0.0610
VARIANCE	0.1199	0.2409	0.1141	0.1262	0.2037	0.3038	0.3944	0.5414	1.5448	1.3886
SQDEV	2.8951	5.6276	2.8158	3.1456	4.8002	6.9896	14.5287	16.3210	35.6248	32.0275
ABS	5.5616	9.6486	4.2502	4.9247	5.4858	9.0487	11.4457	13.0732	19.3527	17.8376

TABLE 15

FOREIGN GNP FOR THE FOUR PERIOD SAMPLE - DOMESTIC SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	0.1108	0.0989	0.0201	0.0228	0.0432	0.0436	0.1051	0.1223	0.3251	0.3158
VARIANCE	0.0005	0.0002	0.0000	0.0000	0.0001	0.0000	0.0003	0.0007	0.0023	0.0018
SQDEV	0.0505	0.0398	0.0017	0.0021	0.0077	0.0076	0.0450	0.0620	0.4296	0.4044
ABS	0.4433	0.3957	0.0802	0.0911	0.1728	0.1746	0.4204	0.4891	1.3002	1.2631

FOREIGN GNP FOR THE EIGHT PERIOD SAMPLE - DOMESTIC SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	0.0730	0.0739	0.0128	0.0185	0.0138	0.0282	0.0651	0.1069	0.2062	0.2275
VARIANCE	0.0033	0.0014	0.0001	0.0001	0.0012	0.0004	0.0030	0.0011	0.0238	0.0132
SQDEV	0.0660	0.0533	0.0020	0.0032	0.0099	0.0089	0.0547	0.0991	0.5068	0.5062
ABS	0.6547	0.5913	0.1106	0.1477	0.2549	0.2316	0.5833	0.8556	1.7455	1.8197

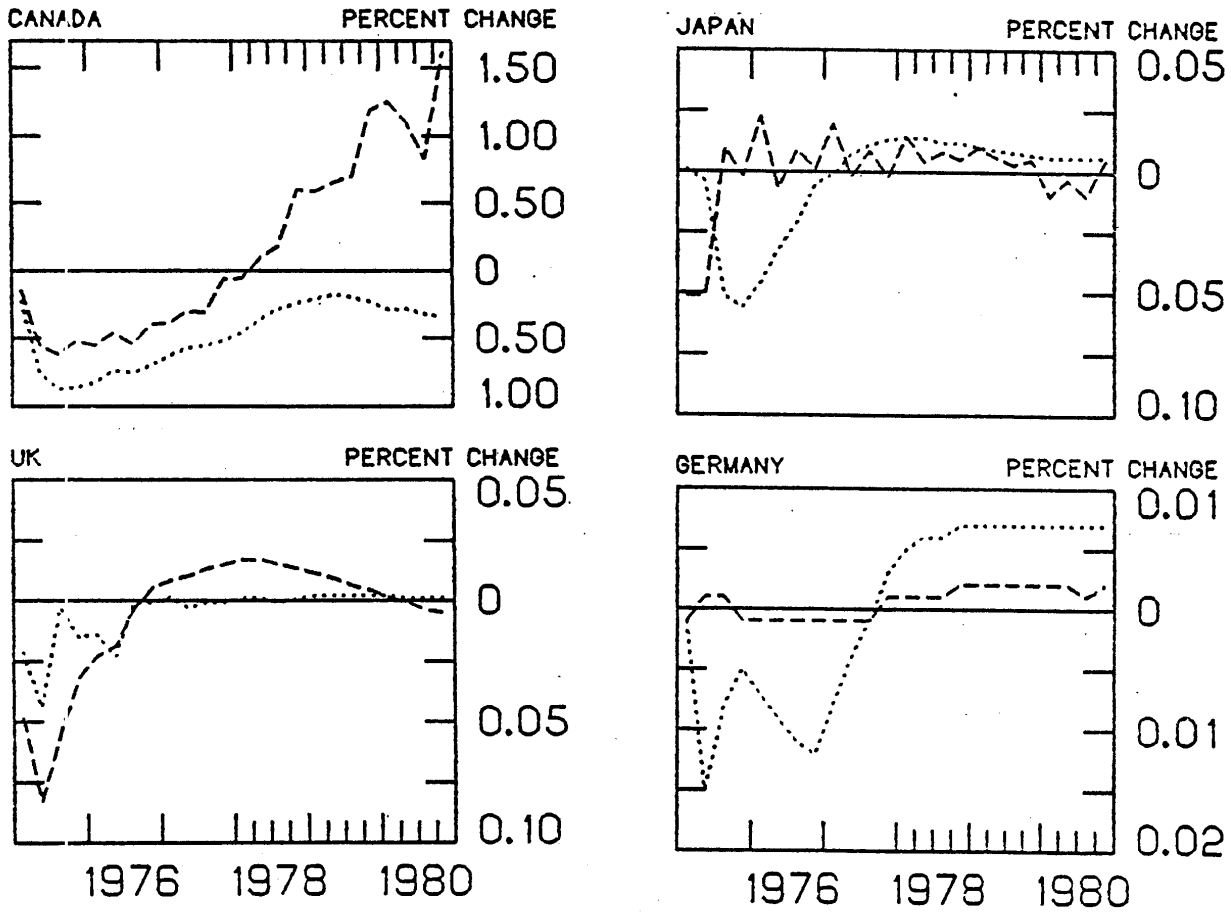
FOREIGN GNP FOR THE FULL PERIOD SAMPLE - DOMESTIC SHOCK

	CANADA		UK		GERMANY		JAPAN		US	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.0130	-0.0192	0.0009	0.0039	0.0049	-0.0065	0.0032	0.0182	0.0246	0.0672
VARIANCE	0.0076	0.0055	0.0001	0.0001	0.0009	0.0009	0.0042	0.0047	0.0311	0.0185
SQDEV	0.1778	0.1350	0.0030	0.0037	0.0206	0.0214	0.0972	0.1166	0.7306	0.5333
ABS	1.8714	1.6426	0.2267	0.2329	0.5950	0.6211	1.3188	1.3312	3.5376	2.4001

TABLE 16

GROSS NATIONAL PRODUCT

SECURITIES SHOCKS



..... = FIXED AGGREGATES
------- = FIXED RATES

FIGURE 7

FOREIGN GNP

SECURITIES SHOCKS

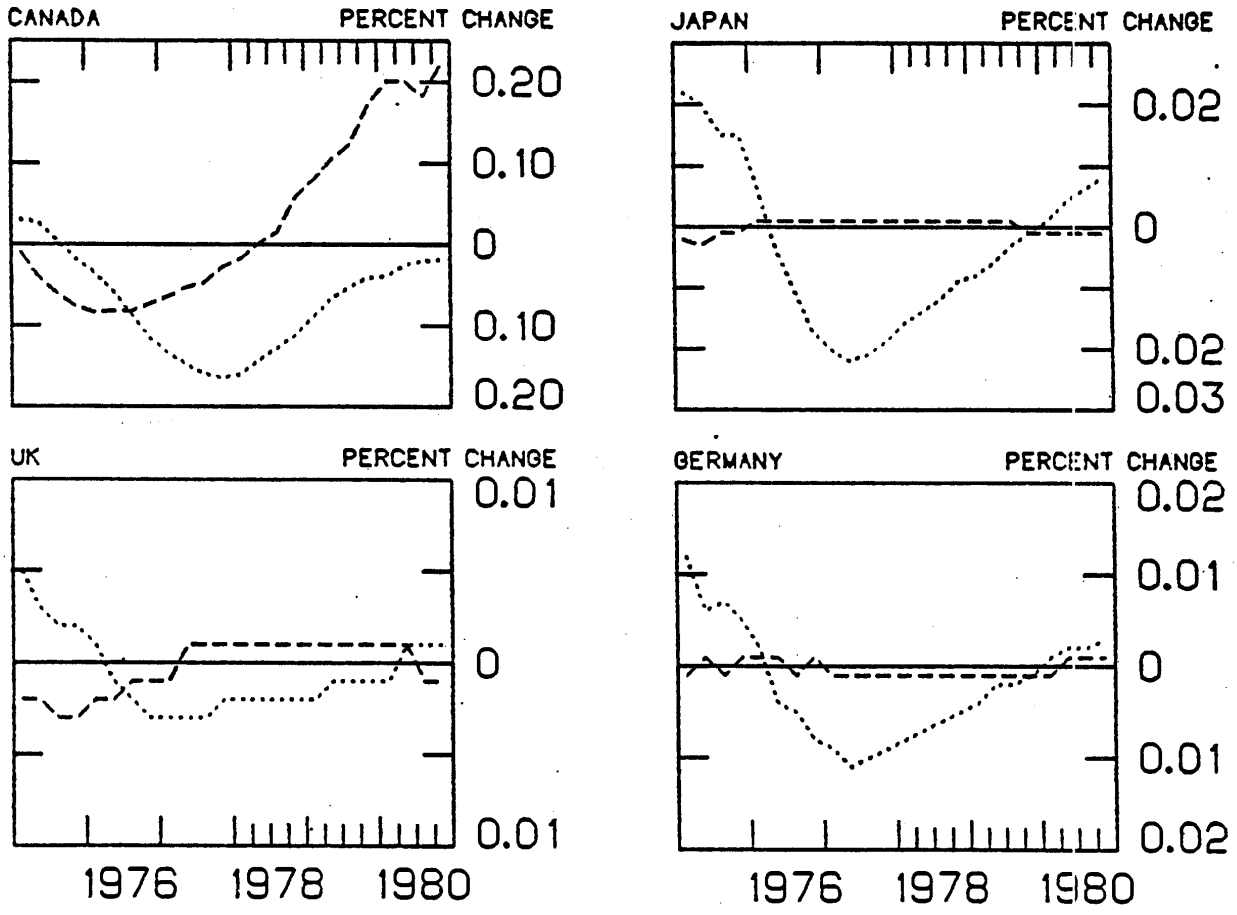


FIGURE 8

SECURITY SHOCK --- GNP (PCER)

TABLE		JAPAN		GERMANY		CANADA		UK	
		(ACC)	(RATE)	(ACC)	(RATE)	(ACC)	(RATE)	(ACC)	(RATE)
*	75 1	0.001	-0.051	-0.	-0.	-0.22	-0.141	-0.021	-0.048
*	75 2	-0.004	-0.051	-0 015	0	-0.755	-0.549	-0.044	-0.083
*	75 3	-0.051	0.01	-0.008	0.	-0.871	-0.618	-0.003	-0.055
*	75 4	-0.056	-0.002	-0.005	-0.	-0.86	-0.518	-0.015	-0.032
*	76 1	-0.046	0.023	-0.007	-0.	-0.823	-0.549	-0.014	-0.023
*	76 2	-0.032	-0.007	-0.009	-0.	-0.736	-0.459	-0.023	-0.019
*	76 3	-0.021	0.009	-0.011	-0.001	-0.753	-0.539	-0.001	-0.003
*	76 4	-0.005	0.001	-0 012	-0.001	-0.7	-0.397	-0.	0.005
*	77 1	-0.001	0.02	-0.008	-0.001	-0.629	-0.391	0.	0.008
*	77 2	0.007	-0.002	-0.004	-0.001	-0.573	-0.305	-0.003	0.01
*	77 3	0.011	0.009	-0.	-0.	-0.552	-0.308	-0.	0.013
*	77 4	0.013	-0.002	0.003	0.	-0.518	-0.06	-0.	0.015
*	78 1	0.014	0.015	0.005	0.001	-0.459	-0.057	0.001	0.017
*	78 2	0.014	0.004	0.006	0.001	-0.364	0.095	0.	0.017
*	78 3	0.012	0.008	0.006	0.001	-0.285	0.177	-0.001	0.015
*	78 4	0.012	0.005	0.007	0.002	-0.244	0.598	0.001	0.013
*	79 1	0.01	0.01	0.007	0.002	-0.209	0.588	0.002	0.011
*	79 2	0.009	0.006	0.007	0.002	-0.172	0.651	0.002	0.009
*	79 3	0.008	0.003	0.007	0.002	-0.197	0.697	0.002	0.006
*	79 4	0.007	0.005	0.007	0.002	-0.23	1.186	0.002	0.004
*	80 1	0.006	-0.01	0.007	0.002	-0.287	1.25	0.002	0.001
*	80 2	0.006	-0.003	0.007	0.002	-0.283	1.099	0.001	-0.001
*	80 3	0.006	-0.01	0.007	0.001	-0.325	0.83	0.001	-0.004
*	80 4	0.006	0.005	0.007	0.002	-0.338	1.621	0.	-0.005

TABLE 17

SECURITIES SHOCK --- FGNP (PCER)

TABLE

			JAPAN		GERMANY		CANADA		UK	
			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.022	-0.002	0.012	-0.	0.03	-0.009	0.005	-0.002
*	75	2	0.02	-0.003	0.006	0.	0.027	-0.039	0.003	-0.002
*	75	3	0.015	-0.001	0.007	-0.	0.005	-0.06	0.002	-0.003
*	75	4	0.015	-0.001	0.005	0.	-0.017	-0.076	0.002	-0.003
*	76	1	0.007	0.	0.002	0.	-0.034	-0.084	0.001	-0.002
*	76	2	-0.003	0.	-0.004	0.	-0.055	-0.082	-0.	-0.002
*	76	3	-0.01	0.	-0.005	-0.	-0.084	-0.083	-0.002	-0.001
*	76	4	-0.017	0.	-0.008	0.	-0.114	-0.074	-0.003	-0.001
*	77	1	-0.02	0.001	-0.009	-0.	-0.133	-0.065	-0.003	-0.
*	77	2	-0.022	0.	-0.011	-0.001	-0.148	-0.053	-0.003	0.
*	77	3	-0.021	0.	-0.01	-0.001	-0.16	-0.047	-0.003	0.
*	77	4	-0.019	0.	-0.009	-0.001	-0.165	-0.028	-0.002	0.001
*	78	1	-0.016	0.001	-0.008	-0.001	-0.16	-0.018	-0.002	0.001
*	78	2	-0.014	0.	-0.007	-0.	-0.143	0.	-0.002	0.001
*	78	3	-0.012	0.	-0.006	-0.	-0.128	0.014	-0.002	0.001
*	78	4	-0.009	0.	-0.005	-0.001	-0.112	0.057	-0.002	0.001
*	79	1	-0.008	0.	-0.004	-0.001	-0.09	0.079	-0.002	0.001
*	79	2	-0.006	0.	-0.002	-0.	-0.067	0.104	-0.001	0.001
*	79	3	-0.003	0.	-0.002	-0.	-0.053	0.121	-0.001	0.001
*	79	4	-0.001	-0.	-0.	-0.	-0.041	0.172	-0.	0.001
*	80	1	0.001	-0.001	0.001	-0.	-0.039	0.201	-0.	0.
*	80	2	0.004	-0.001	0.002	0.	-0.025	0.201	0.	0.
*	80	3	0.006	-0.001	0.002	0.	-0.02	0.182	0.001	-0.
*	80	4	0.008	-0.001	0.003	0.	-0.019	0.222	0.001	-0.

TABLE 18

SECURITY SHOCK --- RS (ER)

			JAPAN		GERMANY		CANADA		UK	
TABLE			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	-0.154	0.	-0.023	0.	-0.007	0.	0.038	-0.075
*	75	2	-0.226	0.	-0.019	0.	-0.378	0.	-0.003	-0.069
*	75	3	-0.021	0.	-0.028	0.	-0.539	0.	-0.019	-0.058
*	75	4	-0.06	0.	-0.015	0	-0.573	0.	-0.04	-0.054
*	76	1	-0.028	0.	-0.006	0.	-0.568	0.	-0.043	-0.048
*	76	2	-0.021	0.	-0.007	0.	-0.586	0.	-0.036	-0.045
*	76	3	-0.01	0.	-0.008	0.	-0.665	0.	-0.017	-0.042
*	76	4	-0.006	0.	-0.009	0.	-0.62	0	-0.01	-0.039
*	77	1	0.005	0.	-0.006	0.	-0.582	0.	-0.003	-0.036
*	77	2	0.006	0.	-0.002	0.	-0.587	0.	-0.002	-0.033
*	77	3	0.01	0.	-0.002	0.	-0.601	0.	0.003	-0.03
*	77	4	0.007	0.	-0.001	0	-0.578	0.	0.004	-0.027
*	78	1	0.009	0.	0.	0.	-0.52	0.	0.005	-0.024
*	78	2	0.007	0.	-0.	0.	-0.46	0.	-0.	-0.021
*	78	3	0.007	0.	-0.001	0.	-0.416	0.	-0.007	-0.019
*	78	4	0.005	0.	-0.001	0.	-0.392	0.	-0.013	-0.016
*	79	1	0.006	0.	-0.001	0.	-0.336	0.	-0.016	-0.013
*	79	2	0.006	0	-0.002	0.	-0.261	0.	-0.013	-0.01
*	79	3	0.007	0.	-0.001	0.	-0.261	0.	-0.011	-0.008
*	79	4	0.005	0.	-0.001	0.	-0.271	0.	-0.009	-0.005
*	80	1	0.007	0.	-0.001	0.	-0.297	0	-0.005	-0.003
*	80	2	0.008	0.	-0.001	0.	-0.27	0.	-0.002	-0.001
*	80	3	0.008	0.	-0.	0.	-0.284	0.	-0.001	0.001
*	80	4	0.005	0.	0.	0.	-0.31	0.	-0.001	0.003

TABLE 19

TABLE 20

SECURITY SHOCK --- ER (PCER)

			JAPAN		GERMANY		CANADA		UK	
TABLE			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	1.644	0.	0.893	0.	1.853	0	0.566	0
*	75	2	0.202	0	0.126	0.	2.111	0	-0.004	0.
*	75	3	0.082	0.	0.085	0.	1.664	0.	0.017	0
*	75	4	-0.156	0.	0.048	0.	1.122	0.	0.036	0
*	76	1	-0.105	0.	-0.023	0.	0.736	0.	0.038	0.
*	76	2	-0.161	0.	-0.063	0.	0.495	0.	0.03	0.
*	76	3	-0.047	0.	-0.055	0	0.305	0.	0.01	0.
*	76	4	-0.116	0.	-0.058	0.	0.203	0	0.009	0.
*	77	1	-0.078	0	-0.046	0	0.172	0.	0.007	0
*	77	2	-0.107	0.	-0.036	0	0.147	0.	0.019	0.
*	77	3	-0.068	0.	-0.027	0.	0.107	0.	0.03	0.
*	77	4	-0.076	0.	-0.025	0.	0.075	0	0.019	0.
*	78	1	-0.057	0.	-0.02	0.	0.079	0.	0.017	0.
*	78	2	-0.062	0	-0.019	0.	0.11	0.	0.013	0.
*	78	3	-0.053	0.	-0.018	0	0.143	0.	0.014	0.
*	78	4	-0.056	0.	-0.017	0.	0.154	0	0.013	0.
*	79	1	-0.047	0.	-0.016	0.	0.169	0.	0.011	0.
*	79	2	-0.049	0.	-0.018	0	0.203	0.	0.009	0.
*	79	3	-0.045	0	-0.019	0.	0.202	0	0.008	0
*	79	4	-0.045	0	-0.022	0.	0.151	0	0.008	0.
*	80	1	-0.04	0	-0.023	0.	0.054	0.	0.008	0.
*	80	2	-0.04	0.	-0.025	0.	-0.026	0.	0.008	0
*	80	3	-0.037	0.	-0.026	0.	-0.108	0.	0.006	0.
*	80	4	-0.034	0.	-0.026	0	-0.207	0.	0.007	0.

SECURITY SHOCK --- M1 (PCER)

		JAPAN		GERMANY		CANADA		UK	
		(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
75	1	0.	-0.034	0.	0.	0.	-0.109	0.	-0.005
75	2	0.	-0.039	0.	0.005	0.	-0.511	0.	-0.032
75	3	0.	-0.017	0.	0.005	0.	-0.868	0.	-0.039
75	4	0.	-0.017	0.	0.004	0.	-0.945	0.	-0.025
76	1	0.	-0.005	0.	0.005	0.	-1.035	0.	-0.011
76	2	0.	-0.015	0.	0.004	0.	-1.149	0.	-0.01
76	3	0.	-0.007	0.	0.004	0.	-1.367	0.	-0.004
76	4	0.	-0.009	0.	0.003	0.	-1.335	0.	0.001
77	1	0.	-0.003	0.	0.004	0.	-1.307	0.	0.009
77	2	0.	-0.009	0.	0.005	0.	-1.271	0.	0.015
77	3	0.	-0.006	0.	0.004	0.	-1.313	0.	0.016
77	4	0.	-0.007	0.	0.003	0.	-1.025	0.	0.019
78	1	0.	-0.	0.	0.003	0.	-0.883	0.	0.016
78	2	0.	-0.004	0.	0.003	0.	-0.669	0.	0.014
78	3	0.	0.	0.	0.003	0.	-0.437	0.	0.013
78	4	0.	-0.001	0.	0.003	0.	0.076	0.	0.012
79	1	0.	0.002	0.	0.003	0.	0.344	0.	0.01
79	2	0.	0.002	0.	0.003	0.	0.745	0.	0.009
79	3	0.	0.003	0.	0.004	0.	1.155	0.	0.007
79	4	0.	0.006	0.	0.003	0.	1.905	0.	0.005
80	1	0.	0.007	0.	0.004	0.	2.367	0.	0.002
80	2	0.	0.008	0.	0.005	0.	2.737	0.	0.
80	3	0.	0.005	0.	0.006	0.	2.87	0.	-0.002
80	4	0.	0.012	0.	0.005	0.	3.708	0.	-0.004

TABLE 21

SECURITY SHOCK --- INTVEN (ER)

			JAPAN *		GERMANY		CANADA		UK	
TABLE			(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)	(AGG)	(RATE)
*	75	1	0.	0.462	0.	37.389	0.	28.69	0.	1.648
*	75	2	0.	-0.009	0.	0.024	0.	11.378	0.	-0.022
*	75	3	0.	-0.012	0.	0.07	0.	10.691	0.	-0.009
*	75	4	0.	-0.02	0.	0.049	0.	10.725	0.	-0.009
*	76	1	0.	-0.021	0.	0.048	0.	10.242	0.	-0.003
*	76	2	0.	-0.023	0.	0.033	0.	10.093	0.	0.003
*	76	3	0.	-0.022	0.	0.069	0.	9.811	0.	0.007
*	76	4	0.	-0.025	0.	0.055	0.	9.831	0.	0.011
*	77	1	0.	-0.024	0.	0.038	0.	9.68	0.	0.01
*	77	2	0.	-0.026	0.	0.03	0.	9.799	0.	0.006
*	77	3	0.	-0.026	0.	0.027	0.	9.804	0.	0.002
*	77	4	0.	-0.028	0.	0.065	0.	10.292	0.	0.002
*	78	1	0.	-0.03	0.	0.056	0.	10.287	0.	0.002
*	78	2	0.	-0.031	0.	0.068	0.	10.735	0.	0.002
*	78	3	0.	-0.03	0.	0.074	0.	11.018	0.	0.005
*	78	4	0.	-0.031	0.	0.031	0.	12.133	0.	0.008
*	79	1	0.	-0.029	0.	0.08	0.	12.318	0.	0.009
*	79	2	0.	-0.029	0.	0.064	0.	13.029	0.	0.014
*	79	3	0.	-0.027	0.	0.079	0.	13.707	0.	0.02
*	79	4	0.	-0.026	0.	0.066	0.	15.355	0.	0.028
*	80	1	0.	-0.026	0.	0.038	0.	16.219	0.	0.038
*	80	2	0.	-0.025	0.	0.064	0.	16.79	0.	0.046
*	80	3	0.	-0.022	0.	0.065	0.	16.854	0.	0.056
*	80	4	0.	-0.017	0.	0.036	0.	19.986	0.	0.066

* JAPAN data divided by 10,000

TABLE 22

DOMESTIC GNP FOR THE FOUR PERIOD SAMPLE - SECURITY SHOCK

	CANADA		UK		GERMANY		JAPAN	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.6765	-0.4563	-0.0207	-0.0544	-0.0073	-0.0001	-0.0276	-0.0233
VARIANCE	0.0952	0.0460	0.0003	0.0005	0.0000	0.0000	0.0009	0.0010
SQDEV	2.1160	0.9708	0.0026	0.0132	0.0003	0.0000	0.0058	0.0053
ABS	2.7059	1.8252	0.0827	0.2175	0.0293	0.0003	0.1121	0.1140

DOMESTIC GNP FOR THE EIGHT PERIOD SAMPLE - SECURITY SHOCK

	CANADA		UK		GERMANY		JAPAN	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.7149	-0.4711	-0.0151	-0.0323	-0.0084	-0.0003	-0.0268	-0.0084
VARIANCE	0.0436	0.0222	0.0002	0.0008	0.0000	0.0000	0.0005	0.0008
SQDEV	4.3936	1.9310	0.0034	0.0141	0.0007	0.0000	0.0094	0.0060
ABS	5.7190	3.7691	0.1208	0.2682	0.0675	0.0027	0.2160	0.1549

DOMESTIC GNP FOR THE FULL PERIOD SAMPLE - SECURITY SHOCK

	CANADA		UK		GERMANY		JAPAN	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.4743	0.1625	-0.0046	-0.0054	0.0001	0.0006	-0.0031	-0.0002
VARIANCE	0.0575	0.4691	0.0001	0.0007	0.0001	0.0000	0.0005	0.0003
SQDEV	6.7217	11.4229	0.0034	0.0159	0.0013	0.0000	0.0108	0.0071
ABS	11.3842	13.6809	0.1379	0.4154	0.1602	0.0244	0.3566	0.2687

TABLE 23

FOREIGN GNP FOR THE FOUR PERIOD SAMPLE - SECURITY SHOCK

	CANADA		UK		GERMANY		JAPAN	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	0.0111	-0.0458	0.0029	-0.0025	0.0074	-0.0000	0.0181	-0.0019
VARIANCE	0.0005	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SQDEV	0.0020	0.0109	0.0000	0.0000	0.0003	0.0000	0.0014	0.0000
ABS	0.0794	0.1834	0.0118	0.0099	0.0296	0.0009	0.0724	0.0074

FOREIGN GNP FOR THE EIGHT PERIOD SAMPLE - SECURITY SHOCK

	CANADA		UK		GERMANY		JAPAN	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.0303	-0.0634	0.0010	-0.0021	0.0019	0.0000	0.0061	-0.0008
VARIANCE	0.0027	0.0007	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
SQDEV	0.0261	0.0371	0.0001	0.0000	0.0004	0.0000	0.0018	0.0000
ABS	0.3660	0.5069	0.0176	0.0165	0.0477	0.0011	0.1098	0.0084

FOREIGN GNP FOR THE FULL PERIOD SAMPLE - SECURITY SHOCK

	CANADA		UK		GERMANY		JAPAN	
	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE	M1 EXOG	FX RATE
MEAN	-0.0727	0.0265	-0.0006	-0.0003	-0.0020	-0.0002	-0.0036	-0.000
VARIANCE	0.0038	0.0113	0.0000	0.0000	0.0000	0.0000	0.0002	0.000
SQDEV	0.2135	0.2757	0.0001	0.0000	0.0009	0.0000	0.0044	0.000
ABS	1.8683	2.0718	0.0429	0.0278	0.1274	0.0081	0.2808	0.01

TABLE 24

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- GNP (PCER)

FIX RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCF_PCER_CGNP	X1CF_PCER_CGNP	X6CF_PCER_CGNP	X7CF_PCER_CGNP
*	75	1	-0.184	-0.165	-0.182	0.123
*	75	2	-0.117	-0.097	-0.109	-0.132
*	75	3	-0.107	-0.078	-0.095	0.071
*	75	4	-0.115	-0.078	-0.097	-0.035
*	76	1	-0.113	-0.072	-0.095	0.006
*	76	2	-0.043	-0.001	-0.023	-0.056
*	76	3	-0.034	0.009	-0.014	-0.001
*	76	4	-0.04	0.007	-0.016	-0.044
*	77	1	-0.039	0.006	-0.015	-0.059
*	77	2	-0.039	0.005	-0.013	0.028
*	77	3	-0.032	0.007	-0.007	-0.001
*	77	4	-0.032	0.01	-0.002	0.033
*	78	1	-0.019	0.016	0.008	0.02
*	78	2	-0.003	0.026	0.023	0.032
*	78	3	-0.	0.023	0.024	-0.004
*	78	4	-0.006	0.022	0.027	-0.006
*	79	1	-0.003	0.017	0.027	-0.034
*	79	2	-0.004	0.012	0.026	-0.026
*	79	3	-0.011	0.004	0.019	-0.007
*	79	4	-0.027	-0.001	0.016	-0.004
*	80	1	-0.032	-0.005	0.012	0.002
*	80	2	-0.028	-0.006	0.01	0.012
*	80	3	-0.024	-0.006	0.008	0.021
*	80	4	-0.049	-0.007	0.005	0.006

TABLE 25

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- FGNP (PCER)

FIX RATE	M1 EXOG	BASE EXOG	M2 EXOG

TABLE

			XZCF_PCER_ FGNP	X1CF_PCER_ FGNP	X6CF_PCER_ FGNP	X7CF_PCER_ FGNP
*	75	1	0.018	0.017	0.017	0.008
*	75	2	0.004	0.	0.002	-0.027
*	75	3	0.002	-0.003	-0.001	-0.013
*	75	4	-0.013	-0.019	-0.016	-0.026
*	76	1	-0.016	-0.022	-0.02	-0.015
*	76	2	-0.014	-0.017	-0.017	0.009
*	76	3	-0.014	-0.014	-0.016	0.031
*	76	4	-0.012	-0.006	-0.009	0.039
*	77	1	-0.01	0.002	-0.003	0.041
*	77	2	-0.008	0.008	0.001	0.036
*	77	3	-0.007	0.013	0.005	0.02
*	77	4	-0.007	0.015	0.007	0.005
*	78	1	-0.005	0.016	0.009	-0.008
*	78	2	-0.004	0.016	0.01	-0.012
*	78	3	-0.003	0.014	0.01	-0.011
*	78	4	-0.002	0.013	0.011	-0.002
*	79	1	-0.002	0.012	0.011	0.007
*	79	2	-0.001	0.009	0.01	0.015
*	79	3	-0.001	0.007	0.009	0.018
*	79	4	-0.002	0.005	0.008	0.015
*	80	1	-0.003	0.002	0.006	0.006
*	80	2	-0.003	-0.	0.003	-0.003
*	80	3	-0.003	-0.003	0.002	-0.013
*	80	4	-0.004	-0.006	0.	-0.017

TABLE 26

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- RS (ER)

FIX RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCF_ER_CRS	X1CF_ER_CRS	X6CF_ER_CRS	X7CF_ER_CRS
*	75	1	0.	-0.13	0.004	-2.497
*	75	2	0.	-0.06	-0.004	1.052
*	75	3	0.	-0.061	-0.006	-0.559
*	75	4	0.	-0.059	-0.026	0.622
*	76	1	0.	-0.054	-0.029	0.144
*	76	2	0.	-0.01	-0.024	1.067
*	76	3	0.	-0.008	0.002	-0.042
*	76	4	0.	-0.01	0.003	-0.145
*	77	1	0.	-0.008	0.004	-0.135
*	77	2	0.	-0.008	0.002	-0.872
*	77	3	0.	-0.007	0.001	-0.203
*	77	4	0.	-0.002	-0.	-0.186
*	78	1	0.	0.005	-0.001	0.219
*	78	2	0.	0.012	-0.	0.146
*	78	3	0.	0.01	0.	0.406
*	78	4	0.	0.01	0.001	0.068
*	79	1	0.	0.012	0.001	0.081
*	79	2	0.	0.009	0.002	-0.163
*	79	3	0.	0.001	0.001	-0.253
*	79	4	0.	0.	0.003	-0.153
*	80	1	0.	0.003	0.004	0.005
*	80	2	0.	-0.	0.004	0.065
*	80	3	0.	-0.005	0.004	0.027
*	80	4	0.	-0.004	0.003	0.138

TABLE 27

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- ER (PCER)

FIX RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCF_PCER_CER	X1CF_PCER_CER	X6CF_PCER_CER	X7CF_PCER_CER
*	75	1	0.	-0.146	-0.062	-1.625
*	75	2	0.	-0.191	-0.081	-0.796
*	75	3	0.	-0.185	-0.079	-0.604
*	75	4	0.	-0.159	-0.078	0.082
*	76	1	0.	-0.13	-0.074	0.332
*	76	2	0.	-0.081	-0.066	0.936
*	76	3	0.	-0.044	-0.041	0.688
*	76	4	0.	-0.024	-0.02	0.231
*	77	1	0.	-0.015	-0.005	-0.1
*	77	2	0.	-0.013	0.002	-0.724
*	77	3	0.	-0.012	0.003	-0.759
*	77	4	0.	-0.011	0.001	-0.598
*	78	1	0.	-0.008	-0.002	-0.187
*	78	2	0.	-0.004	-0.007	0.093
*	78	3	0.	-0.005	-0.012	0.389
*	78	4	0.	-0.009	-0.017	0.361
*	79	1	0.	-0.012	-0.021	0.259
*	79	2	0.	-0.016	-0.023	0.018
*	79	3	0.	-0.024	-0.025	-0.226
*	79	4	0.	-0.029	-0.025	-0.314
*	80	1	0.	-0.03	-0.025	-0.227
*	80	2	0.	-0.027	-0.022	-0.08
*	80	3	0.	-0.026	-0.02	0.004
*	80	4	0.	-0.023	-0.019	0.11

TABLE 28

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- M1 (PCER)

FIX RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCF_PCER_CM1	X1CF_PCER_CM1	X6CF_PCER_CM1	X7CF_PCER_CM1
*	75	1	-0.167	0.	-0.176	3.112
*	75	2	-0.174	0.	-0.172	0.223
*	75	3	-0.213	0.	-0.197	1.228
*	75	4	-0.233	0.	-0.177	-0.103
*	76	1	-0.246	0.	-0.164	-0.074
*	76	2	-0.224	0.	-0.118	-1.455
*	76	3	-0.219	0.	-0.13	-0.702
*	76	4	-0.215	0.	-0.131	-0.339
*	77	1	-0.2	0.	-0.123	-0.138
*	77	2	-0.199	0.	-0.119	1.08
*	77	3	-0.198	0.	-0.112	0.803
*	77	4	-0.181	0.	-0.091	0.756
*	78	1	-0.152	0.	-0.066	0.191
*	78	2	-0.13	0.	-0.041	0.028
*	78	3	-0.113	0.	-0.023	-0.503
*	78	4	-0.1	0.	-0.007	-0.323
*	79	1	-0.082	0.	0.01	-0.337
*	79	2	-0.072	0.	0.024	-0.022
*	79	3	-0.075	0.	0.026	0.304
*	79	4	-0.085	0.	0.028	0.372
*	80	1	-0.084	0.	0.032	0.211
*	80	2	-0.087	0.	0.032	0.055
*	80	3	-0.093	0.	0.025	0.027
*	80	4	-0.117	0.	0.021	-0.2

TABLE 29

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- INTVEN (ER)

	FIX RATE	M1 EXOG	BASE EXOG	M2 EXOG

TABLE

			XZCF_ER_ CINTVEN	X1CF_ER_ CINTVEN	X6CF_ER_ CINTVEN	X7CF_ER_ CINTVEN
*	75	1	-0.988	0.	0.	0.
*	75	2	-0.37	0.	0.	0.
*	75	3	-0.299	0.	0.	0.
*	75	4	-0.281	0.	0.	0.
*	76	1	-0.231	0.	0.	0.
*	76	2	-0.256	0.	0.	0.
*	76	3	-0.261	0.	0.	0.
*	76	4	-0.252	0.	0.	0.
*	77	1	-0.229	0.	0.	0.
*	77	2	-0.218	0.	0.	0.
*	77	3	-0.215	0.	0.	0.
*	77	4	-0.22	0.	0.	0.
*	78	1	-0.218	0.	0.	0.
*	78	2	-0.244	0.	0.	0.
*	78	3	-0.269	0.	0.	0.
*	78	4	-0.311	0.	0.	0.
*	79	1	-0.33	0.	0.	0.
*	79	2	-0.367	0.	0.	0.
*	79	3	-0.403	0.	0.	0.
*	79	4	-0.463	0.	0.	0.
*	80	1	-0.503	0.	0.	0.
*	80	2	-0.539	0.	0.	0.
*	80	3	-0.571	0.	0.	0.
*	80	4	-0.68	0.	0.	0.

TABLE 30

FOREIGN GOODS/DOMESTIC GOODS SHOCK --- BASE (ER)

	FIX RATE	M1 EXOG	BASE EXOG	M2 EXOG

TABLE

			XZCF_ER_ CBASE	X1CF_ER_ CBASE	X6CF_ER_ CBASE	X7CF_ER_ CBASE
*	75	1	-0.788	0.436	0.	8.375
*	75	2	-0.308	0.172	0.	-3.674
*	75	3	0.396	0.158	0.	1.647
*	75	4	0.373	-0.085	0.	-2.017
*	76	1	0.51	0.098	0.	1.549
*	76	2	0.52	-0.084	0.	-2.312
*	76	3	0.428	0.058	0.	0.267
*	76	4	0.494	0.064	0.	0.519
*	77	1	0.569	0.051	0.	0.224
*	77	2	0.633	0.043	0.	2.867
*	77	3	0.677	0.03	0.	0.505
*	77	4	0.706	0.014	0.	0.596
*	78	1	0.744	-0.015	0.	-0.747
*	78	2	0.776	-0.042	0.	-0.349
*	78	3	0.778	-0.031	0.	-1.408
*	78	4	0.779	-0.037	0.	-0.121
*	79	1	0.849	-0.047	0.	-0.307
*	79	2	0.918	-0.031	0.	0.608
*	79	3	0.975	0.002	0.	0.917
*	79	4	1.807	0.001	0.	-0.595
*	80	1	1.366	-0.002	0.	0.375
*	80	2	1.922	0.004	0.	-0.376
*	80	3	1.727	0.003	0.	0.281
*	80	4	2.102	0.001	0.	-0.385

TABLE 31

CANADA DOMESTIC GNP FOR THE FOUR PERIOD SAMPLE - FOREIGN SHOCK

XCF

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.1309	-0.1045	-0.1207	0.0065
VARIANCE	0.0013	0.0017	0.0017	0.0129
SQDEV	0.0723	0.0488	0.0633	0.0389
ABS	0.5236	0.418	0.4826	0.3616

CANADA DOMESTIC GNP FOR THE EIGHT PERIOD SAMPLE - FOREIGN SHOCK

XCF

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0942	-0.0594	-0.0788	-0.0086
VARIANCE	0.0027	0.0037	0.0034	0.0062
SQDEV	0.0897	0.0542	0.0732	0.044
ABS	0.7536	0.508	0.6302	0.4682

CANADA DOMESTIC GNP FOR THE FULL PERIOD SAMPLE - FOREIGN SHOCK

XCF

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0458	-0.0147	-0.0193	-0.0023
VARIANCE	0.0022	0.0023	0.003	0.0023
SQDEV	0.1008	0.0569	0.0779	0.0533
ABS	1.1003	0.6818	0.8722	0.764

TABLE 32

CANADA FOREIGN GNP FOR THE FOUR PERIOD SAMPLE - FOREIGN SHOCK

XCF

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	0.0029	-0.0014	0.0003	-0.0145
VARIANCE	0.0002	0.0002	0.0002	0.0003
SQDEV	0.0005	0.0006	0.0006	0.0016
ABS	0.0373	0.0387	0.0366	0.0743

CANADA FOREIGN GNP FOR THE EIGHT PERIOD SAMPLE - FOREIGN SHOCK

XCF

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0056	-0.0081	-0.0077	0.0008
VARIANCE	0.0002	0.0002	0.0002	0.0006
SQDEV	0.0013	0.0017	0.0016	0.0044
ABS	0.0933	0.0979	0.0994	0.1678

CANADA FOREIGN GNP FOR THE FULL PERIOD SAMPLE - FOREIGN SHOCK

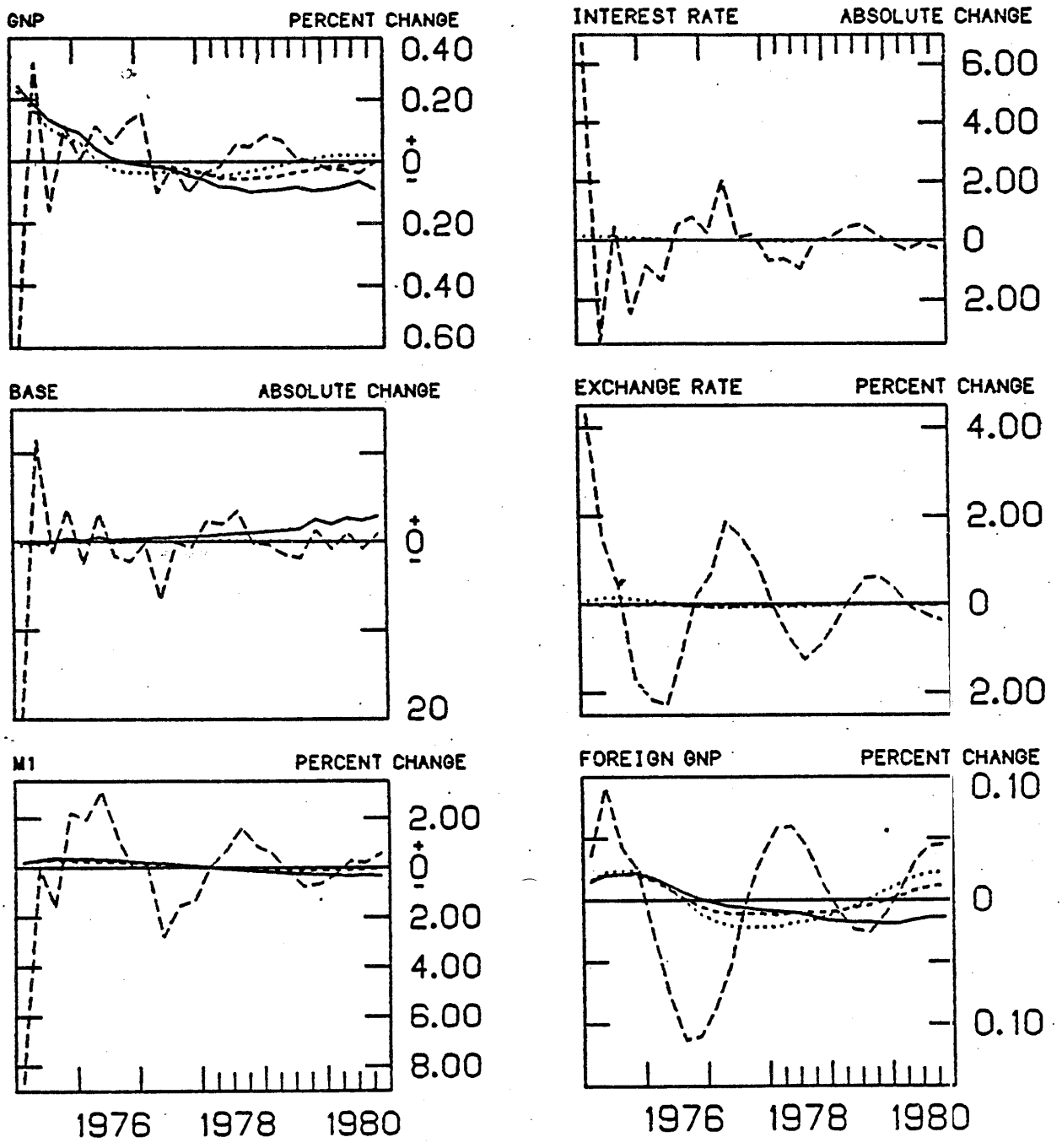
XCF

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0046	0.0024	0.0015	0.0043
VARIANCE	0.0001	0.0001	0.0001	0.0004
SQDEV	0.0017	0.0033	0.0025	0.0095
ABS	0.159	0.2379	0.2048	0.3961

TABLE 33

DOMESTIC GOODS/SAVINGS

CANADIAN SHOCKS



——— = FIXED RATE
..... = M1 EXOGENOUS
- - - - - = BASE EXOGENOUS
– – – – = M2 EXOGENOUS

FIGURE 10

DOMESTIC GOODS/SAVINGS SHOCK --- CGNP (PCER)

FIX. RATE M1 EXOG BASE EXOG M2 EXOG

			X2CD_PCER_ CGNP	X1CD_PCER_ CGNP	X6CD_PCER_ CGNP	X7CD_PCER_ CGNP
*	75	1	0.247	0.228	0.246	-0.596
*	75	2	0.186	0.167	0.187	0.322
*	75	3	0.133	0.108	0.136	-0.159
*	75	4	0.109	0.082	0.111	0.116
*	76	1	0.092	0.06	0.092	0.006
*	76	2	0.042	0.006	0.041	0.117
*	76	3	0.011	-0.025	0.013	0.057
*	76	4	-0.004	-0.036	-0.	0.122
*	77	1	-0.011	-0.036	-0.007	0.156
*	77	2	-0.017	-0.035	-0.011	-0.1
*	77	3	-0.026	-0.033	-0.017	-0.013
*	77	4	-0.044	-0.034	-0.024	-0.1
*	78	1	-0.057	-0.038	-0.036	-0.038
*	78	2	-0.08	-0.047	-0.054	-0.017
*	78	3	-0.083	-0.039	-0.055	0.052
*	78	4	-0.098	-0.032	-0.055	0.048
*	79	1	-0.094	-0.022	-0.051	0.085
*	79	2	-0.091	-0.012	-0.046	0.068
*	79	3	-0.082	0.001	-0.035	0.011
*	79	4	-0.095	0.009	-0.027	-0.
*	80	1	-0.091	0.018	-0.017	-0.025
*	80	2	-0.079	0.021	-0.011	-0.025
*	80	3	-0.065	0.02	-0.005	-0.038
*	80	4	-0.091	0.02	0.001	-0.001

TABLE 34

DOMESTIC GOODS/SAVINGS SHOCK --- FGNP (PCER)

FIX RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCD PCER FGNP	X1CD PCER FGNP	X6CD PCER FGNP	X7CD PCER FGNP
*	75	1	0.016	0.016	0.015	0.036
*	75	2	0.02	0.023	0.021	0.092
*	75	3	0.021	0.024	0.021	0.043
*	75	4	0.022	0.024	0.02	0.025
*	76	1	0.018	0.018	0.016	-0.029
*	76	2	0.012	0.009	0.009	-0.078
*	76	3	0.006	-0.001	0.001	-0.113
*	76	4	0.001	-0.011	-0.005	-0.11
*	77	1	-0.002	-0.017	-0.009	-0.087
*	77	2	-0.005	-0.021	-0.011	-0.052
*	77	3	-0.006	-0.022	-0.011	-0.
*	77	4	-0.008	-0.022	-0.011	0.034
*	78	1	-0.009	-0.022	-0.012	0.058
*	78	2	-0.01	-0.019	-0.011	0.06
*	78	3	-0.012	-0.017	-0.01	0.043
*	78	4	-0.016	-0.014	-0.01	0.013
*	79	1	-0.017	-0.01	-0.009	-0.008
*	79	2	-0.018	-0.005	-0.006	-0.024
*	79	3	-0.018	0.001	-0.004	-0.026
*	79	4	-0.019	0.008	-0.	-0.012
*	80	1	-0.019	0.013	0.003	0.008
*	80	2	-0.016	0.019	0.008	0.031
*	80	3	-0.014	0.022	0.011	0.044
*	80	4	-0.014	0.023	0.012	0.045

TABLE 35

DOMESTIC GOODS/SAVINGS SHOCK --- CRS (ER)

FIX. RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			X2CD_ER_CRS	X1CD_ER_CRS	X6CD_ER_CRS	X7CD_ER_CRS
*	75	1	0.	0.157	0.012	6.735
*	75	2	0.	0.134	0.012	-3.438
*	75	3	0.	0.124	0.011	0.489
*	75	4	0.	0.091	0.045	-2.479
*	76	1	0.	0.07	0.045	-0.826
*	76	2	0.	0.045	0.042	-1.366
*	76	3	0.	0.027	0.01	0.509
*	76	4	0.	0.01	0.007	0.802
*	77	1	0.	-0.001	0.005	0.268
*	77	2	0.	-0.004	0.006	2.05
*	77	3	0.	-0.003	0.007	0.104
*	77	4	0.	-0.012	0.007	0.203
*	78	1	0.	-0.022	0.007	-0.685
*	78	2	0.	-0.031	0.005	-0.625
*	78	3	0.	-0.025	0.004	-0.948
*	78	4	0.	-0.024	0.003	-0.013
*	79	1	0.	-0.023	0.003	0.095
*	79	2	0.	-0.017	0.002	0.432
*	79	3	0.	-0.003	0.002	0.547
*	79	4	0.	0.001	-0.008	0.193
*	80	1	0.	-0.001	-0.01	-0.082
*	80	2	0.	0.002	-0.01	-0.324
*	80	3	0.	0.011	-0.008	-0.086
*	80	4	0.	0.011	-0.006	-0.276

TABLE 36

DOMESTIC GOODS/SAVINGS SHOCK --- CER (PCER)

FIX. RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCD_PCER_CER	X1CD_PCER_CER	X6CD_PCER_CER	X7CD_PCER_CER
*	75	1	0.	0.085	-0.007	4.317
*	75	2	0.	0.138	-0.019	1.532
*	75	3	0.	0.15	-0.032	0.415
*	75	4	0.	0.12	-0.022	-1.665
*	76	1	0.	0.075	-0.013	-2.133
*	76	2	0.	0.026	-0.01	-2.273
*	76	3	0.	-0.014	-0.029	-1.085
*	76	4	0.	-0.044	-0.046	0.206
*	77	1	0.	-0 064	-0.057	0.687
*	77	2	0.	-0.072	-0.059	1.874
*	77	3	0.	-0.069	-0.055	1.536
*	77	4	0.	-0.066	-0.048	0.953
*	78	1	0.	-0.066	-0.041	-0.04
*	78	2	0.	-0.067	-0.034	-0.729
*	78	3	0.	-0.061	-0.027	-1.255
*	78	4	0.	-0.048	-0.019	-0.947
*	79	1	0.	-0.037	-0.012	-0.449
*	79	2	0.	-0.025	-0.006	0.137
*	79	3	0.	-0.01	-0.002	0.594
*	79	4	0.	0.002	-0.004	0.617
*	80	1	0.	0.003	-0.008	0.334
*	80	2	0.	-0.004	-0.016	-0.084
*	80	3	0.	-0.007	-0.021	-0.231
*	80	4	0.	-0.015	-0.024	-0.372

TABLE 37

DOMESTIC GOODS/SAVINGS SHOCK --- CM1 (PCER)

FIX. RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			X2CD_PCER_CM1	X1CD_PCER_CM1	X6CD_PCER_CM1	X7CD_PCER_CM1
*	75	1	0.207	0.	0.191	-8.667
*	75	2	0.292	0.	0.268	0.009
*	75	3	0.367	0.	0.336	-1.598
*	75	4	0.357	0.	0.28	2.219
*	76	1	0.341	0.	0.241	1.929
*	76	2	0.334	0.	0.212	3.114
*	76	3	0.311	0.	0.219	1.251
*	76	4	0.26	0.	0.19	0.023
*	77	1	0.202	0.	0.151	0.015
*	77	2	0.161	0.	0.124	-2.796
*	77	3	0.127	0.	0.101	-1.554
*	77	4	0.068	0.	0.061	-1.351
*	78	1	0.012	0.	0.017	0.011
*	78	2	-0.05	0.	-0.028	0.645
*	78	3	-0.096	0.	-0.057	1.62
*	78	4	-0.141	0.	-0.077	0.884
*	79	1	-0.177	0.	-0.099	0.549
*	79	2	-0.222	0.	-0.122	-0.112
*	79	3	-0.246	0.	-0.124	-0.755
*	79	4	-0.277	0.	-0.107	-0.663
*	80	1	-0.3	0.	-0.097	-0.298
*	80	2	-0.316	0.	-0.087	0.267
*	80	3	-0.308	0.	-0.065	0.203
*	80	4	-0.32	0.	-0.046	0.575

TABLE 38

DOMESTIC GOODS/SAVINGS SHOCK --- REV_CDNFAFL (ER)

FIX RATE	M1 EXOG	BASE EXOG	M2 EXOG
--------	-------	----------	-------

		X2CD_ER REV_CDNFAFL	X1CD_ER REV_CDNFAFL	X6CD_ER RFV CDNFAFL	X7CD_ER REV CDNFAFL
75	1	-0.199	0.	0.	0.
75	2	-0.266	0.	0.	0.
75	3	-0.286	0.	0.	0.
75	4	-0.334	0.	0.	0.
76	1	-0.382	0.	0.	0.
76	2	-0.402	0.	0.	0.
76	3	-0.408	0.	0.	0.
76	4	-0.436	0.	0.	0.
77	1	-0.459	0.	0.	0.
77	2	-0.488	0.	0.	0.
77	3	-0.501	0.	0.	0.
77	4	-0.529	0.	0.	0.
78	1	-0.531	0.	0.	0.
78	2	-0.525	0.	0.	0.
78	3	-0.524	0.	0.	0.
78	4	-0.548	0.	0.	0.
79	1	-0.541	0.	0.	0.
79	2	-0.556	0.	0.	0.
79	3	-0.568	0.	0.	0.
79	4	-0.623	0.	0.	0.
80	1	-0.665	0.	0.	0.
80	2	-0.681	0.	0.	0.
80	3	-0.68	0.	0.	0.
80	4	-0.804	0.	0.	0.

TABLE 39

CANADA DOMESTIC GNP FOR THE FOUR PERIOD SAMPLE - DOMESTIC SHOCK

XCD

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	0.1689	0.1465	0.17	-0.0793
VARIANCE	0.0038	0.0042	0.0036	0.1576
SQDEV	0.1254	0.0986	0.1265	0.498
ABS	0.6756	0.586	0.6802	1.1932

CANADA DOMESTIC GNP FOR THE EIGHT PERIOD SAMPLE - DOMESTIC SHOCK

XCD

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	0.102	0.0738	0.1032	-0.0019
VARIANCE	0.0075	0.0086	0.0074	0.0757
SQDEV	0.1357	0.1041	0.1368	0.5297
ABS	0.8245	0.7122	0.8257	1.4948

CANADA DOMESTIC GNP FOR THE FULL PERIOD SAMPLE - DOMESTIC SHOCK

XCD

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0119	0.0146	0.0156	0.0019
VARIANCE	0.0096	0.0049	0.0065	0.0259
SQDEV	0.2243	0.1173	0.1552	0.596
ABS	1.9258	1.1298	1.278	2.2757

TABLE 40

CANADA FOREIGN GNP FOR THE FOUR PERIOD SAMPLE - DOMESTIC SHOCK

XCD

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	0.0196	0.0217	0.019	0.0488
VARIANCE	0.	0.	0.	0.0009
SQDEV	0.0016	0.0019	0.0015	0.0122
ABS	0.0785	0.0868	0.0761	0.1952

CANADA FOREIGN GNP FOR THE EIGHT PERIOD SAMPLE - DOMESTIC SHOCK

XCD

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	0.0145	0.0128	0.012	-0.0168
VARIANCE	0.0001	0.0002	0.0001	0.006
SQDEV	0.0021	0.0025	0.0018	0.0439
ABS	0.1161	0.1261	0.1062	0.5248

CANADA FOREIGN GNP FOR THE FULL PERIOD SAMPLE - DOMESTIC SHOCK

XCD

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0037	0.0008	0.0012	-0.0003
VARIANCE	0.0002	0.0003	0.0001	0.0031
SQDEV	0.0051	0.0072	0.0032	0.0708
ABS	0.3202	0.3812	0.2445	1.0711

TABLE 41

CANADIAN SECURITIES SHOCKS

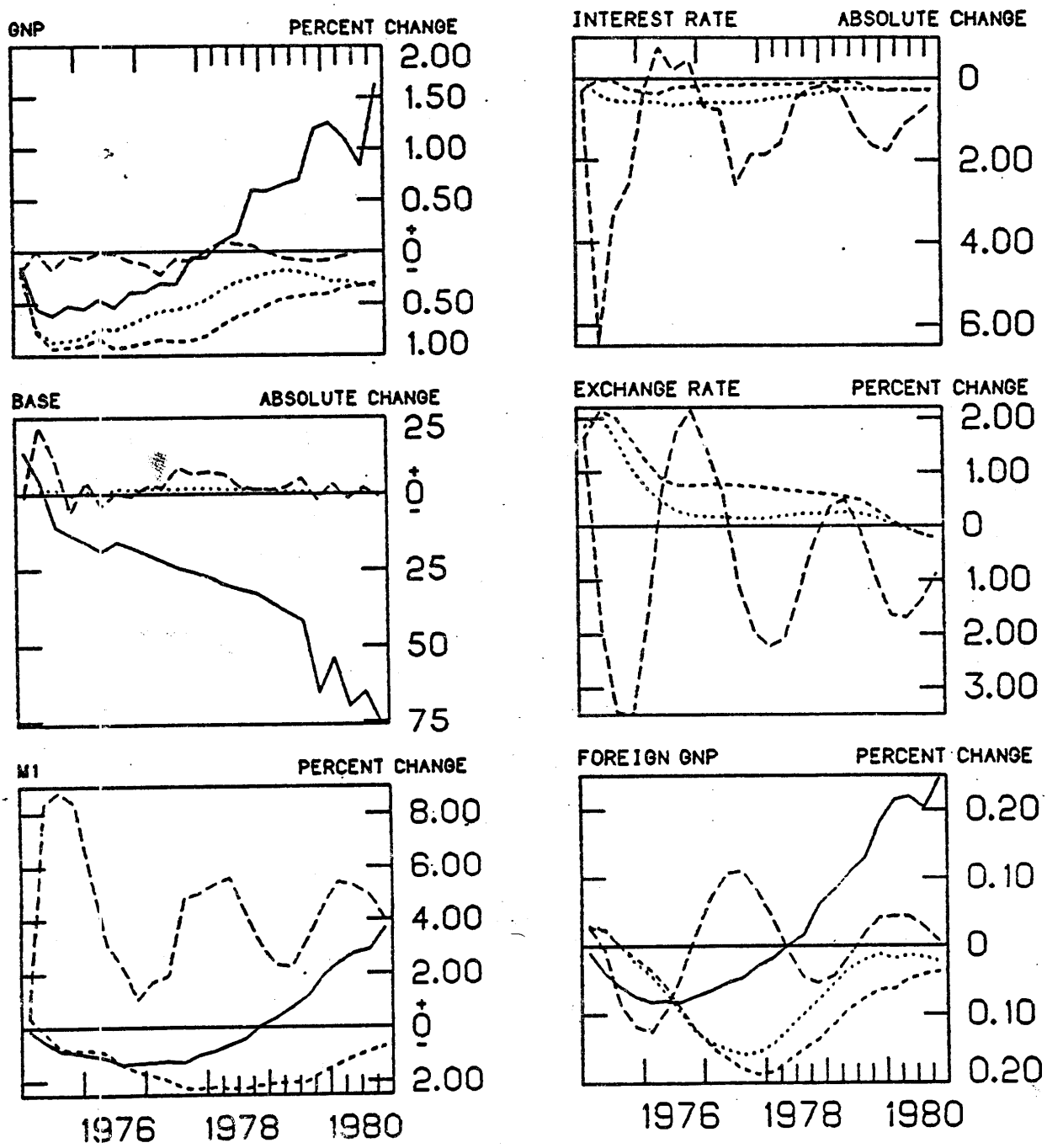


FIGURE 11

SECURITY SHOCK --- CGNP (PCER)

	FIX. RATE	M1 EXOG	EASE EXOG	M2 EXOG
	XZCS_PCER_ CGNP	X1CS_PCER_ CGNP	X6CS_PCER_ CGNP	X7CS_PCER_ CGNP
* 75 1	-0.141	-0.22	-0.182	-0.184
* 75 2	-0.549	-0.754	-0.78	0.005
* 75 3	-0.618	-0.87	-0.933	-0.176
* 75 4	-0.518	-0.858	-0.922	-0.038
* 76 1	-0.549	-0.822	-0.902	-0.075
* 76 2	-0.458	-0.736	-0.841	-0.015
* 76 3	-0.539	-0.753	-0.927	-0.015
* 76 4	-0.397	-0.701	-0.912	-0.088
* 77 1	-0.391	-0.631	-0.878	-0.115
* 77 2	-0.304	-0.575	-0.846	-0.218
* 77 3	-0.308	-0.556	-0.862	-0.072
* 77 4	-0.06	-0.523	-0.858	-0.091
* 78 1	-0.057	-0.464	-0.811	0.006
* 78 2	0.095	-0.369	-0.71	0.095
* 78 3	0.177	-0.291	-0.627	0.074
* 78 4	0.598	-0.251	-0.582	0.059
* 79 1	0.588	-0.214	-0.52	-0.013
* 79 2	0.652	-0.176	-0.449	-0.064
* 79 3	0.697	-0.2	-0.434	-0.081
* 79 4	1.188	-0.231	-0.411	-0.089
* 80 1	1.252	-0.286	-0.408	-0.081
* 80 2	1.102	-0.28	-0.345	-0.039
* 80 3	0.834	-0.32	-0.329	0.003
* 80 4	1.627	-0.334	-0.301	-0.

TABLE 42

SECURITIES SHOCK --- FGNP (PCER)

FIX RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCS_PCER_FGNP	X1CS_PCER_FGNP	X6CS_PCER_FGNP	X7CS_PCER_FGNP
*	75	1	-0.009	0.029	0.028	0.028
*	75	2	-0.039	0.026	0.023	-0.005
*	75	3	-0.059	0.001	0.002	-0.084
*	75	4	-0.074	-0.025	-0.018	-0.118
*	76	1	-0.082	-0.044	-0.035	-0.126
*	76	2	-0.08	-0.069	-0.06	-0.093
*	76	3	-0.082	-0.098	-0.091	-0.043
*	76	4	-0.073	-0.127	-0.124	0.018
*	77	1	-0.065	-0.142	-0.148	0.074
*	77	2	-0.053	-0.152	-0.165	0.107
*	77	3	-0.047	-0.159	-0.18	0.11
*	77	4	-0.029	-0.156	-0.187	0.08
*	78	1	-0.018	-0.144	-0.184	0.039
*	78	2	0.001	-0.121	-0.167	-0.008
*	78	3	0.015	-0.1	-0.151	-0.045
*	78	4	0.059	-0.079	-0.137	-0.054
*	79	1	0.082	-0.055	-0.114	-0.044
*	79	2	0.108	-0.033	-0.091	-0.015
*	79	3	0.128	-0.021	-0.077	0.018
*	79	4	0.182	-0.013	-0.064	0.041
*	80	1	0.214	-0.019	-0.063	0.043
*	80	2	0.219	-0.014	-0.048	0.043
*	80	3	0.203	-0.017	-0.042	0.027
*	80	4	0.246	-0.024	-0.038	0.006

TABLE 43

SECURITY SHOCK --- CRS (ER)

FIX. RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			X2CS_ER_CRS	X1CS_ER_CRS	X6CS_ER_CRS	X7CS_ER_CRS
*	75	1	0.	-0.008	-0.317	-0.3
*	75	2	0.	-0.379	-0.059	-6.436
*	75	3	0.	-0.539	-0.045	-3.336
*	75	4	0.	-0.573	-0.26	-2.582
*	76	1	0.	-0.568	-0.331	-0.287
*	76	2	0.	-0.586	-0.38	0.763
*	76	3	0.	-0.665	-0.231	0.201
*	76	4	0.	-0.619	-0.205	0.446
*	77	1	0.	-0.581	-0.172	-0.684
*	77	2	0.	-0.586	-0.163	-0.775
*	77	3	0.	-0.601	-0.165	-2.601
*	77	4	0.	-0.578	-0.157	-1.871
*	78	1	0.	-0.52	-0.151	-1.86
*	78	2	0.	-0.46	-0.142	-1.59
*	78	3	0.	-0.418	-0.13	-0.52
*	78	4	0.	-0.394	-0.119	-0.239
*	79	1	0.	-0.339	-0.106	-0.17
*	79	2	0.	-0.265	-0.097	-0.382
*	79	3	0.	-0.266	-0.09	-1.201
*	79	4	0.	-0.275	-0.262	-1.633
*	80	1	0.	-0.301	-0.295	-1.781
*	80	2	0.	-0.274	-0.296	-1.185
*	80	3	0.	-0.286	-0.289	-0.896
*	80	4	0.	-0.311	-0.274	-0.596

TABLE 44

SECURITY SHOCK --- CER (PCER)

FIX. RATE M1 EXOG BASE EXOG M2 EXOG

TABLE

			XZCS_PCER_CER	X1CS_PCER_CER	X6CS_PCER_CER	X7CS_PCER_CER
*	75	1	0.	1.851	1.652	1.663
*	75	2	0.	2.101	2.131	-1.865
*	75	3	0.	1.641	2.039	-3.46
*	75	4	0.	1.092	1.628	-3.472
*	76	1	0.	0.706	1.212	-1.648
*	76	2	0.	0.47	0.884	0.631
*	76	3	0.	0.289	0.769	1.733
*	76	4	0.	0.198	0.748	2.15
*	77	1	0.	0.18	0.767	1.438
*	77	2	0.	0.169	0.773	0.589
*	77	3	0.	0.146	0.757	-1.127
*	77	4	0.	0.133	0.73	-1.966
*	78	1	0.	0.151	0.703	-2.235
*	78	2	0.	0.187	0.675	-2.077
*	78	3	0.	0.22	0.644	-1.187
*	78	4	0.	0.23	0.615	-0.265
*	79	1	0.	0.238	0.589	0.35
*	79	2	0.	0.253	0.547	0.488
*	79	3	0.	0.228	0.488	-0.102
*	79	4	0.	0.156	0.313	-0.95
*	80	1	0.	0.046	0.124	-1.65
*	80	2	0.	-0.05	-0.037	-1.694
*	80	3	0.	-0.141	-0.155	-1.364
*	80	4	0.	-0.226	-0.213	-0.879

TABLE 45

SECURITY SHOCK --- CM1 (PCER)

	FIX. RATE	M1 EXOG	BASE EXOG	M2 EXOG

TABLE

			XZCS_PCER_ CM1	X1CS_PCER_ CM1	X6CS_PCER_ CM1	X7CS_PCER_ CM1
*	75	1	-0.109	0.	0.408	0.385
*	75	2	-0.511	0.	-0.202	8.321
*	75	3	-0.868	0.	-0.774	8.788
*	75	4	-0.945	0.	-0.839	8.375
*	76	1	-1.035	0.	-0.853	5.536
*	76	2	-1.148	0.	-0.939	3.143
*	76	3	-1.366	0.	-1.403	2.318
*	76	4	-1.334	0.	-1.645	1.06
*	77	1	-1.306	0.	-1.784	1.721
*	77	2	-1.27	0.	-1.981	1.929
*	77	3	-1.312	0.	-2.245	4.833
*	77	4	-1.024	0.	-2.271	4.994
*	78	1	-0.882	0.	-2.225	5.347
*	78	2	-0.668	0.	-2.272	5.565
*	78	3	-0.436	0.	-2.272	4.242
*	78	4	0.077	0.	-2.159	3.079
*	79	1	0.344	0.	-2.071	2.345
*	79	2	0.746	0.	-2.049	2.25
*	79	3	1.157	0.	-2.024	3.317
*	79	4	1.908	0.	-1.674	4.505
*	80	1	2.371	0.	-1.388	5.445
*	80	2	2.743	0.	-1.121	5.274
*	80	3	2.879	0.	-0.901	4.923
*	80	4	3.72	0.	-0.734	4.037

TABLE 46

SECURITY SHOCK --- REV_CDNFAFL (ER)

FIX RATE M1 EXOG BASE EXOG M2 EXOG

BLE

		XZCS_ER REV_CDNFAFL	X1CS_ER REV_CDNFAFL	X6CS_ER REV_CDNFAFL	X7CS_ER REV_CDNFAFL
75	1	28.689	0.	0.	0.
75	2	11.379	0.	0.	0.
75	3	10.692	0.	0.	0.
75	4	10.727	0.	0.	0.
76	1	10.245	0.	0.	0.
76	2	10.098	0.	0.	0.
76	3	9.816	0.	0.	0.
76	4	9.838	0.	0.	0.
77	1	9.688	0.	0.	0.
77	2	9.808	0.	0.	0.
77	3	9.812	0.	0.	0.
77	4	10.3	0.	0.	0.
78	1	10.295	0.	0.	0.
78	2	10.744	0.	0.	0.
78	3	11.026	0.	0.	0.
78	4	12.143	0.	0.	0.
79	1	12.332	0.	0.	0.
79	2	13.046	0.	0.	0.
79	3	13.729	0.	0.	0.
79	4	15.384	0.	0.	0.
80	1	16.254	0.	0.	0.
80	2	16.834	0.	0.	0.
80	3	16.909	0.	0.	0.
80	4	20.058	0.	0.	0.

TABLE 47

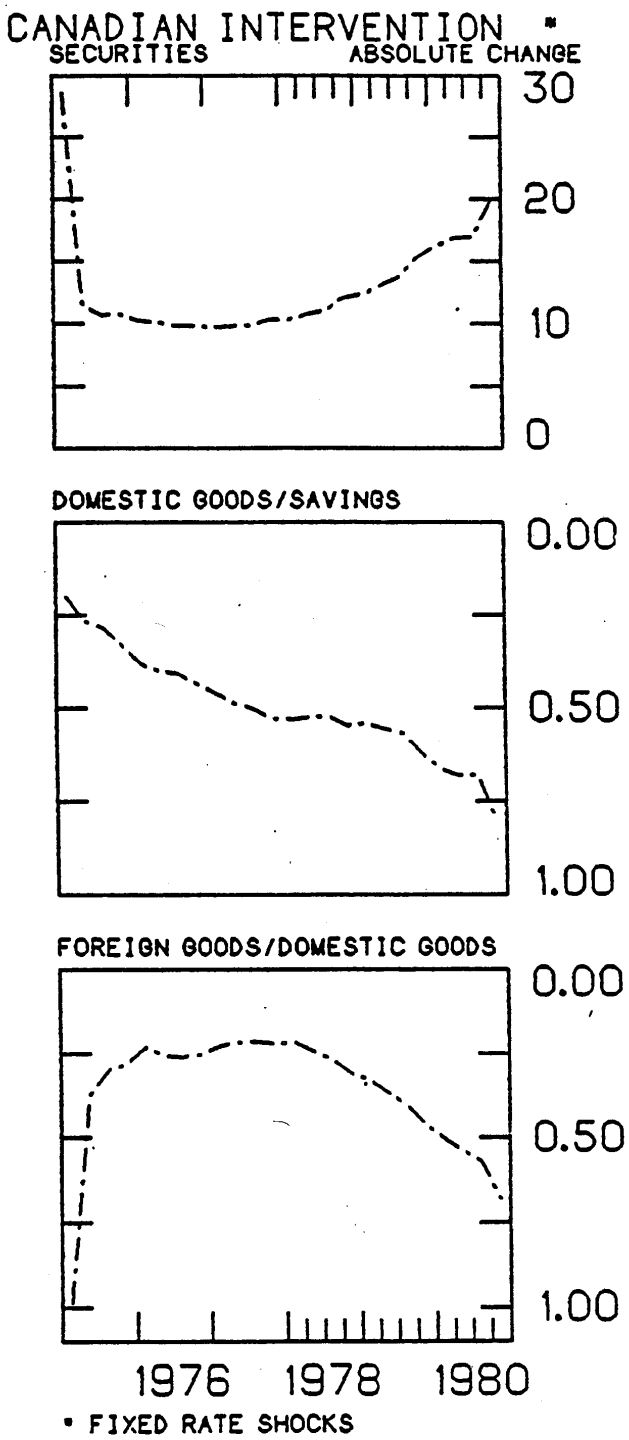

CANADIAN INTERVENTION *
SECURITIES
ABSOLUTE CHANGE
30
20
10
0
DOMESTIC GOODS/SAVINGS
0.00
0.50
1.00
FOREIGN GOODS/DOMESTIC GOODS
0.00
0.50
1.00
1976
1978
1980
* FIXED RATE SHOCKS

FIGURE 12

CANADA DOMESTIC GNP FOR THE FOUR PERIOD SAMPLE - SECURITY SHOCK

XCS

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.4563	-0.6755	-0.7041	-0.0983
VARIANCE	0.046	0.0947	0.1261	0.0093
SQDEV	0.9707	2.1093	2.3616	0.0664
ABS	1.8251	2.702	2.8166	0.4027

CANADA DOMESTIC GNP FOR THE EIGHT PERIOD SAMPLE - SECURITY SHOCK

XCS

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.471	-0.7142	-0.7998	-0.0733
VARIANCE	0.0222	0.0434	0.0651	0.0053
SQDEV	1.9301	4.3841	5.573	0.0802
ABS	3.7681	5.7133	6.3982	0.5957

CANADA DOMESTIC GNP FOR THE FULL PERIOD SAMPLE - SECURITY SHOCK

XCS

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	0.1634	-0.4756	-0.657	-0.0505
VARIANCE	0.4708	0.057	0.0602	0.006
SQDEV	11.4696	6.739	11.7448	0.1994
ABS	13.6988	11.4137	15.7689	1.6968

TABLE 48

CANADA FOREIGN GNP FOR THE FOUR PERIOD SAMPLE - SECURITY SHOCK

XCS

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0453	0.0077	0.0088	-0.0446
VARIANCE	0.0008	0.0006	0.0004	0.0046
SQDEV	0.0106	0.0021	0.0016	0.0217
ABS	0.1812	0.0803	0.071	0.2339

CANADA FOREIGN GNP FOR THE EIGHT PERIOD SAMPLE - SECURITY SHOCK

XCS

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	-0.0623	-0.0383	-0.0345	-0.0528
VARIANCE	0.0007	0.0032	0.003	0.0037
SQDEV	0.0358	0.0344	0.0303	0.0484
ABS	0.4985	0.4174	0.3821	0.5146

CANADA FOREIGN GNP FOR THE FULL PERIOD SAMPLE - SECURITY SHOCK

XCS

	FX RATE	M1 EXOG	BASE EXOG	M2 EXOG
MEAN	0.0312	-0.0648	-0.0888	-0.0001
VARIANCE	0.0126	0.0037	0.0044	0.0043
SQDEV	0.3138	0.1851	0.2906	0.0991
ABS	2.1682	1.6655	2.2371	1.2675

TABLE 49