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The Obstacles to Macroeconomic Policy Coordination in the 1990s and an Analysis of International Nominal Targeting (INT)

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Abstract

The paper reviews the recent history of international macroeconomic policy coordination, including examples of three sorts of obstacles to successful coordination: the difficulties of, respectively, compliance, credibility, and certainty. It is argued that nominal-GNP targeting has the best chance of overcoming such obstacles as compared, in particular, to money-targeting. The McKibbin Sachs Global model is used to evaluate an internationally coordinated version of nominal GNP targeting, in the presence of shocks in oil prices, money demand, and goods demand.

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The world has seen three phases of international economic policy-making, since the postwar system of fixed exchange rates and U.S. economic hegemony came unravelled in 1973. First, in the 1970s, the prevailing model was Keynesian and the prevailing wind from Washington urged joint worldwide expansion in line with the "**locomotive theory.**" Germany and Japan eventually succumbed to these urgings in 1978 when they agreed to undertake some expansion at the Bonn Summit. But by 1980, worldwide inflation had reached such high levels that the Keynesian model, the locomotive theory, and the Bonn Summit -- indeed, even coordination itself -- had all acquired "bad names".

The second phase, 1980-1984, constituted the **triumph of monetarism.** By the beginning of the 1980s, the Central Banks of the United States, the United Kingdom, Germany, Switzerland and Japan had all largely accepted the monetarist prescription of pre-committing to a fixed rate of growth of M1 or some other monetary aggregate, in an effort to stop inflation. Supporting the switch in emphasis was the accession to power of Margaret Thatcher in Britain in 1979, Ronald Reagan in the U.S. in 1981, and Helmut Kohl in Germany in 1982.

It is perfectly possible for one to be a monetarist and yet favor the international coordination of policy and management of exchange rates, as Ronald McKinnon shows us. Nevertheless, the monetarist view that in fact dominated was the anti-coordination one that came from Milton Friedman: each country chose its own independent macroeconomic policies, and the market was allowed to

determine exchange rates with little or no guidance from policy-makers. During the first Reagan Administration (1981-1984), the United States insisted that this decentralized system, which extended the laissez-faire principles of microeconomics to the platform of global macroeconomic policy-making, worked the best. Other trading partners had their doubts, but could do nothing toward coordination without American participation.

If the inflation problem torpedoed the plans of the 1970s, then the overvaluation of the dollar and the resulting U.S. trade deficit torpedoed the plans of the early 1980s. If excessive monetary expansion was identified as the cause of the problem of the 1970s, then the unusual U.S. monetary/fiscal policy mix and resulting high real interest rates was identified as the cause of the problems of the early 1980s. If the passing of Democrat and Labor governments at the end of the 1970s facilitated the triumph of monetarism, the transition to the next phase in 1985 was a simpler matter of the turnover of some key officials in the U.S. Treasury. The anti-cooperativeness and monetarism of Donald Regan and Beryl Sprinkel gave way to the pragmatism of James Baker and Richard Darman.

The G-7 Coordination Mechanism

The third phase, G-7 coordination, was inaugurated at a meeting of Finance Ministers, at the Plaza Hotel in New York in September 1985. At the time, the membership was confined to the traditional G-5 -- the U.S., Japan, Germany, France and the United

Kingdom -- and the focus was on exchange rates. (The meeting produced the "Plaza Accord," under which the United States agreed to cooperate with the others in bringing down the value of the dollar). At the G-7 Summit Meeting the next year in Tokyo, the heads of state agreed to expand the membership of the G-5 Finance Ministers' meetings to include Canada and Italy, and to expand the list of "objective indicators" that the Ministers would focus on. Thenceforth the G-7 would focus in their meetings on a set of 10 variables: the growth rate of GNP, the interest rate, the inflation rate, the unemployment, the ratio of the fiscal deficit to GNP, the current account and trade balances, the money growth rate, international reserve holdings, and the exchange rate.

No pretense was made that the members would rigidly commit to specific numbers for these indicators, in the sense that sanctions would be imposed on a country if it deviated far from the values agreed upon. But the plan did include the understanding that "appropriate remedial measures" would be taken whenever there developed significant deviations from the "intended course." This language would seem to suggest that the indicators were not intended to be merely national forecasts, that the system was intended to include some substantive bargaining over policies, rather than only the exchange of information.

The list of indicators has been further discussed, and trimmed down, at subsequent G-7 meetings. By the time of the Venice Summit in June 1987, the list had apparently been reduced to six indicators: growth, inflation, trade balances, government budgets,

monetary conditions, and exchange rates.[1] Treasury Secretary James Baker, however, in October 1987 told the IMF Annual Meeting that "the United States is prepared to consider utilizing, as an additional indicator in the coordination process, the relationship among our currencies and a basket of commodities, including gold...." At the Toronto Summit of June 1988, "the G-7 countries welcomed the addition of a commodity price indicator and the progress made toward refining the analytical use of indicators."

As we enter the 1990s, the G-7 coordination process seems to be stalled. It is not that some specific new economic problem has replaced the U.S. dollar as the topic of concern. The problem of U.S. international over-borrowing will no doubt continue to condition international policy-making in the coming decade. But it is not clear what cooperative macroeconomic tasks the existing G-7 body will be called upon to accomplish in the 1990s.

In what direction will it be desirable for the G-7 to agree to move the macroeconomic policies of its members? The desirable direction for coordination depends entirely on what "public good" is missing from the world equilibrium. International spillover effects can render the noncooperative ("Nash") equilibrium unsatisfactory in a variety of ways. A prime example is when the world is in a recession due to inadequate demand, with each country afraid to expand on its own for fear that its trade balance will deteriorate. Then, if they agree to expand simultaneously, they can attain higher levels of output and employment without any one

partner suffering a deterioration in its trade balance. This was the logic behind the locomotive theory put forward by the United States at the Bonn Summit in 1978. An opposite sort of example is when the Nash non-cooperative equilibrium is overly inflationary, with no single leader willing to accept the role of supplying the "public good" of a currency that is stable in purchasing power. This is often thought to be the logic that originally lay behind the founding of the European Monetary System.[2]

While it is not clear whether the 1990s will require coordinated expansion or coordinated discipline, I believe that it is clear that the present G-7 mechanism is in some ways not well-designed to respond to future developments. The current mechanism of coordination is vulnerable to serious obstacles of three sorts: compliance, inflation-fighting credibility, and uncertainty. These obstacles are so severe that, if the system is not improved, the institution of international coordination is as likely to make the world economy worse-off as better-off.[3]

Three Obstacles to International Macroeconomic Policy Coordination

The first obstacle to successful and meaningful coordination is the difficulty of ensuring compliance. If the member countries make commitments to attainable macroeconomic targets that can be monitored -- which requires that they be explicit, measurable, and preferably public -- then they are unlikely to cheat on them. But under the current system, the presence of so many different indicators on the G-7 list, the vagueness as to whether these

variables are in fact forecasts, goals or commitments, and the secrecy surrounding the whole procedure, all imply that substantive enforceable agreements are unlikely to emerge from G-7 meetings.

A primary drawback of the list is that it is too long to be practical. When each country has ten indicators but only two or three policy instruments, it is virtually certain that the indicators will give conflicting signals. Thus the national authorities will feel little constraint on their setting of policy instruments. [In this light, a serious coordination scheme might begin in the 1990s by setting only one target, and then only progress to commitments to multiple variables when and if sufficient political consensus and confidence has developed to justify that degree of sacrifice of sovereignty.]

The next drawback is that on the G-7 list, no distinction is made as to whether the variables are forecasts, goals, or commitments. It is difficult to imagine a G-7 meeting, for example, applying moral censure to one of its members for having experienced a lower rate of inflation during the year than had been agreed upon in the preceding meeting, or a higher rate of real growth. The third drawback of the G-7 list is that explicit targets are not made public. How can any pressure be brought to bear on countries that stray from the agreed-upon targets (whether it is moral suasion, embarrassment, the effect on long-term reputations, or outright sanctions) if the targets are kept secret?

To take an example, in the Baker-Miyazawa Agreement reached in San Francisco in September 1986 [subsequently broadened to include

Germany and the others at the Louvre in February 1987], the Japanese apparently agreed to a fiscal expansion in exchange for a promise from the U.S. Treasury Secretary that he would stop "talking down" the dollar, plus the usual U.S. promise to cut the budget deficit. In the months that followed, each side viewed the other as not fully living up to the agreement. (The episode is described by Funabashi.) But it was difficult for anyone to verify the extent of compliance, because the precise terms of the original agreement had not been public.

The second danger that threatens the success of coordination efforts is the risk that cooperative agreements will be biased in favor of expansion, with the result that high inflation rates will re-emerge. The argument is that if governments set up the machinery for joint welfare maximization period-by-period, the cooperative equilibrium in each period is likely to entail a greater degree of expansion than the Nash non-cooperative equilibrium, as countries lose the inhibitions of worsened trade balances. Governments may find this joint expansion advantageous within any given period, but in the long run it will undermine the governments' inflation-fighting credibility and result in a higher inflation rate for a given level of output. In this view [developed by Kenneth Rogoff[4]], renouncing the machinery of coordination is one of the ways that governments can credibly pre-commit to less inflationary paths.

The implication of the credibility issue is that a scheme for

coordination is more likely in the long-run to produce gains if the plan has the national governments making, not just commitments to each other on a period-by-period basis, but also some degree of commitment to a monetary or **nominal anchor** on a longer term basis. There are four nominal variables on the G-7 list of indicators: the money supply, the price level, the price of gold, and the exchange rate. We must develop grounds for choosing among candidates for the nominal variable around which coordination should focus.

To review our conclusions so far, the compliance problem suggests that coordination should involve an explicitly-agreed and publicly-announced intermediate target. The inflation-fighting credibility problem suggests that the intermediate target to which the governments commit should be a nominal variable. There exists a third obstacle to successful coordination, uncertainty, and it leads to the suggestion that the nominal intermediate target to which the countries should best commit is one that does not even appear on the current G7 list at all: nominal GNP.

Uncertainty makes it difficult for each country to know what policy changes are in its interest. This difficulty arises whether the uncertainty centers on the initial position of the economy (the "baseline forecast"), the desired policy targets (e.g., full employment), or the changes in monetary and fiscal policy necessary to produce desired effects (the multipliers). [Major econometric models of the world economy disagree, for example, on whether a foreign monetary expansion has a positive or negative effect on

domestic trade and output.] All three kinds of uncertainty make it difficult for each country in the bargaining process to know even what policy changes it should want its partners to make. A number of pessimistic conclusions emerge. Given differing perceptions, the policy-makers may not be able to agree on a coordination package; and even if they do agree, the effects may be different from what they anticipated.[5]

The standard German view of the joint expansion agreed upon at the 1978 Bonn Summit is that it turned out to have been undesirable, because by 1980, as we have seen, the priority had shifted back to fighting inflation. One possible way to think of this view is as an example of uncertainty about the baseline position of the economy relative to the optimum: the 1979 oil price increase associated with the crisis in Iran moved the world economy to a more inflationary position than had been anticipated at the time of the Summit. Another way to think of it is as an example of disagreement over the correct model. In the model that the representatives of the United States and some smaller countries have in mind, a monetary expansion can raise output and employment, whereas in the Germans' model monetary expansion simply goes into prices.

Compliance can always be a problem for coordination, as noted above, because each country stands to benefit in the short run by deviating from an agreement and leaving its trading partners to carry the burden. But the problem is particularly great in the presence of uncertainty. This is true for two reasons. First, it

is difficult to verify compliance if the "performance criteria" that are used to monitor compliance are not directly enough under the control of the authorities, because they can always claim plausibly that failure to meet the targets that they agreed to was not their fault. For this reason, the inflation rate or price level is not a good candidate to be the nominal target to which countries commit. Secondly, a country may end up regretting ex post the target that it agreed to ex ante if it is not directly enough related to the goals that it ultimately cares about. For this reason, the money supply is not a good candidate to be the nominal target to which countries commit. A country that commits to a narrow range for the money supply will regret it if there is a shift in velocity.

To take an example from recent U.S. history, the Federal Reserve, citing large velocity shifts, decided beginning in late 1982 to allow M1 to break firmly outside their pre-announced target zone. [They did not publicly admit that they had abandoned monetarism until several years later.] M1 grew 10.3 per cent per year from 1982:II to 1986:II. For four years the monetarists decried the betrayal of the money growth rule, and warned that a major return of inflation was imminent. Nobody can doubt, in retrospect that the Fed chose the right course. Even with the recovery that began in 1983 and continued through the four years and beyond, nominal GNP grew more slowly than the money supply: 8.0 per cent per year. Thus velocity declined at 2.3 per cent per year, in contrast to its past historical pattern of increasing at

roughly 3 per cent a year. If the Fed had followed the explicit monetarist prescription of rigidly pre-committing to a money growth rate lower than that of the preceding period, such as 3 per cent, and velocity had followed the same path, then nominal GNP would have grown at only 0.7 per cent a year. This number is an upper bound, because with even lower inflation than occurred, velocity would almost certainly have fallen even more than it did. The implication seems clear that the 1981-82 recession would have lasted another five years!

The Proposal for Nominal GNP-Targeting

It can be argued that, whatever the degree of precommitment to a nominal target, nominal GNP makes a more suitable target than the other nominal variables that have been proposed. The general argument has been made well by others.[6] In the event of disturbances in the banking system, disturbances in the public's demand for money, or other disturbances affecting the demand for goods, a policy of holding nominal GNP steady insulates the economy; neither real income nor the price level need be affected. In the event of disturbances to supply, such as the oil price increases of the 1970s, the change is divided equi-proportionately between an increase in the price level and a fall in output. For some countries, this is roughly the split that a discretionary policy would choose anyway. In general, unless one believes that precisely equal weights should be placed on the two objectives of stabilizing inflation and real growth, fixing nominal GNP will not

give precisely the right answer. But if the choice is among the available nominal anchors, nominal GNP gives an outcome characterized by greater stability of output and the price level. The inflation rate is too far outside the direct control of the authorities; the money supply is too distantly related to the price level, output, or other objectives; and the exchange rate and the price of gold are too distant both from the control of the authorities and from the objectives.

An Appendix to this paper considers the problem formally, for the special case where the objective function puts equal weight on percentage variation in output and variation in the inflation rate. We make no judgment on the desirable degree of pre-commitment to a nominal target, so long as it is greater than zero and less than infinity.[7] But the Appendix shows that if does commit to a nominal target, nominal GNP (or nominal demand) makes a more suitable target than the other nominal variables that have been proposed. [The Appendix in Frankel (1989) shows that a nominal GNP target also dominates an exchange rate or price-of-gold target (unless extraordinarily high weight is placed on the objective of stabilizing the exchange rate or price of gold).]

The model of the economy to which the Appendix applies nominal GNP targeting is greatly oversimplified, consisting as it does of only one country and essentially only two equations (aggregate supply and money market equilibrium). It is able to show that targeting nominal GNP is superior to targeting the money supply, under fairly general conditions. But, in the absence of a full

parameterized model, the Appendix does not contain enough information to choose between a targeting rule and discretion.

An International Analysis of Nominal GNP Targeting

Warwick McKibbin and I have begun to apply the McKibbin-Sachs Global model to these problems. The McKibbin-Sachs Global model (MSG) fully articulates the household, firm, asset-market, wage-setting, balance-of-payments, and government sectors, and covers seven regions: the U.S., Japan, Germany, the rest of the European Monetary System, the rest of the OECD, non-oil developing countries and OPEC. It is state-of-the-art in that it keeps track of the cumulating stocks of domestic and foreign debt over time, and assumes model-consistent (i.e., rational) expectations. Expositions and applications of the MSG model include McKibbin and Sachs (1986 and 1989ab).

We consider several alternative plans, in each case assuming that the three member countries (the U.S., Japan, and Germany) adopt the same policy regime. (The rest of the OECD countries, which are reported as a unit, are assumed to leave their money supplies unaltered.) We consider three shocks: an increase in oil prices or other supply shock, a money demand shock, and a goods demand shock. The tables report implications over the subsequent five years for eight macroeconomic variables (all of which are on the G-7 list of indicators). We will follow the Appendix in considering only the first two variables as ultimate objectives:

output and inflation. All effects are reported as percentage deviations from baseline. The effects should then be squared for use in a quadratic loss function, where it is assumed that it is optimal to get as close as possible to the baseline path for output and inflation. The last column conveys the overall magnitude of the effect over time; it is the square root of the sum of the yearly squared effects. The quadratic loss function can be thought of as the sum of the number in the first row squared and the number in the second row squared (either for a given year or for the long run).

We consider first the comparison of the money supply rule and the nominal GNP rule. The experiment captures uncoordinated setting of target paths, though one could interpret the decision of the three countries to settle on nominal GNP (or the money supply) as the variable on which each will independently target, as itself the outcome of a cooperative international decision.

Table 12.1A reports the effects of a doubling of the world price of oil under a money rule. All countries experience a sharp increase in the price level in the first year (roughly 3 per cent), and a somewhat smaller decrease in the level of output [with the largest effects felt in the United States]. Since the monetary authorities hold firm, the interest rate rises. The contraction of output continues in the second year, and the price level begins to fall back toward its original level. In the long run, there is no effect. [The effect becomes essentially zero 15 or 20 years out].

Table 12.4A reports the effects of the same-sized supply shock under a nominal GNP rule. The effects on output and inflation are equal in magnitude (approximately) and offsetting, so as to keep the effect on nominal GNP equal to zero. [For any given year, the effect on the level of nominal GNP, relative to the baseline, is the number in the top row plus the cumulation of the numbers in the second row up to that year.] Achieving the outcome of a fixed nominal GNP requires a monetary contraction in each country. For each of the three large countries, the short-run output loss is greater than under the money rule (and by more on a percentage basis than the gain in inflation). But, assuming that equal weight is placed on the two objectives in the quadratic loss function, the nominal GNP rule's success at reducing inflation is enough to yield welfare gains in the long run, especially in the case of Germany. [In the first year, welfare is higher only in the case of Germany.]

Next we consider a five per cent increase in U.S. money demand. In table 12.1B we see that the excess demand for money raises the interest rate in the first year, causing a fall in output and in the price level of roughly one per cent each in the United States. [In the other countries, output and inflation rise somewhat rather than fall, as the tight U.S. monetary conditions are transmitted inversely via an appreciation of the dollar and a worsening of the U.S. trade balance]. It is here that the superiority of the nominal GNP rule (table 12.4B) comes through the most strongly. The U.S. recession is avoided completely, as the money supply is automatically increased by 5 per cent to offset the

increase in money demand. When the increase in money demand originates in Japan or Germany, similar results obtain in those countries [tables 4D vs. 1D, or 4F vs. 1F, omitted to save space, but available on request].

The choice is almost as clear-cut for the case of a one per cent increase in U.S. real demand for goods. Under the money rule (table 12.1C), the impact is a rise in output and inflation. The U.S. expansion is transmitted positively to the other countries via a U.S. trade deficit. Under the nominal GNP rule (Table 12.4C) by contrast, an automatic contraction of the money supply leads to much smaller changes on output and inflation. The reported fall in the price level on impact is somewhat greater than the rise in output, even though total nominal GNP is held constant. The explanation is that the inflation numbers that are reported refer to the CPI, not the GNP deflator, and an appreciation of the dollar against the other currencies puts downward pressure on U.S. import prices. [Again, the results for an increase in goods demand, that originates in Japan or Germany are available on request (tables 1E, 1G, 4E and 4G).] In sum, the nominal GNP rule seems to dominate the money rule, regardless of the origin of the disturbance.

Either sort of rule, nominal GNP targeting or money targeting, necessarily loses the advantage of discretionary policy that it can respond to the shocks. We now consider how the nominal GNP rule fares against a regime of full discretion, which is shown in Tables 12.2. The discretion is assumed to be exercised by a benevolent far-sighted government, which maximizes a present discounted value

of the objective function [a quadratic function of deviations of output and inflation from the baseline, with equal weights on the two, as in the Appendix]. We do not yet incorporate any "inflationary bias", that is, any temptation for the government to expand irresponsibly for the short-run gain of higher output [as in the Appendix].

Discretion for the oil-shock case is shown in table 12.2A. Even without a built-in inflationary bias, the government opts to take the supply shock more in the form of higher inflation than in the form of output loss. The recession lasts only one year, while it lasts two years in the case of the nominal GNP rule [or the money rule]. In the fourth and fifth years, however, output does not increase as much under discretion as it does under the nominal GNP rule. [As our discretionary government optimizes its intertemporal objective function, it smooths out the path of output slightly, relative to the nominal GNP rule. Doing so requires a more variable path for the money supply, however: a sharp initial contraction, followed by an offsetting expansion beginning in the second year. This property of the money path must be a result of rational expectations.] The squared loss function shows that the outcome under discretion is more desirable than the outcome under the nominal GNP rule, in the long run. [In the short run, discretion dominates for the case of the U.S., but not for Japan or Germany.] Evidently, the advantages of letting the optimizing government respond to the oil shock are greater than the advantages of being able to reduce inflation by pre-committing to an

intermediate nominal target.

In the case of a money demand shock, discretion (Table 12.2B) is able to accomplish the same feat, insulation of the economy, as the nominal GNP rule (Table 12.4B).

In the case of a real demand shock, the differences between the regimes are relatively small. The discretionary government responds with a first-year monetary contraction that is great enough to push the price level down rather than up (Table 12.2C), the same thing that happens under the nominal GNP rule. The government is not able to nullify the effects of the demand shock altogether, apparently because of the appreciation of the dollar, which operates on the CPI relatively more than on output. But discretion succeeds in making the absolute effects on output and the price level (the CPI) even more nearly equal than does the nominal GNP rule, when the demand shock originates in the United States. The squared loss function makes discretion look a little better in the long run (though it makes the nominal GNP rule look slightly better on impact). When the demand shock originates in Japan [Table 2E, not reported] or Germany [2G], however, the initial fall in inflation, and the subsequent rise, are exacerbated in those respective countries.

Summing up the results across the three shocks, the case in favor of pre-commitment to a rule is not clearcut, <u>if</u> the alternative is discretion by a far-sighted government without an inflationary bias. Below, we will build in an inflationary bias to the discretion regime, which will change the conclusions.

None of the cases so far concerns international coordination, interpreted as joint policy-setting on a year-by-year basis. Tables 12.3 consider coordination among the U.S., Japan and Germany, or its equivalent, the maximization by a G-3 central planner of a world objective function, which in this case weights the countries' individual objective functions by their shares of GNP.

Each country responds to the oil price shock (Table 12.3A) with a more expansionary monetary policy than in the non-cooperative discretionary case (or than in the case of a nominal GNP rule). Apparently the non-cooperative equilibrium is handicapped by a tendency of each country to raise its interest rates in a (collectively futile) attempt to bid up the value of its currency and thereby attain lower import prices and a lower CPI. As a result, inflation is slightly higher and the initial fall in output slightly smaller in the cooperative equilibrium, for the U.S., Japan, and Germany. The effect of coordination on the objective function (relative to non-cooperative discretion) is relatively small -- a slight improvement for the U.S., slight deterioration for Japan and Germany -- both in the long run and in the short run. Evidently the standard advantages of coordination, that it allows each country to expand without fear of the implications for their external sector, are fully offset by the "Rogoff" effect, the undermining of public expectations that the monetary authorities will hold the line against inflation.

The nominal GNP rule is better able to resist the temptation

to inflate. But the impact on output is considerably bigger. The objective function shows that coordination dominates in the long run, especially for the U.S. [though the nominal GNP rule dominates for Japan and Germany in the short run].

In the case of the money demand shock, as usual, the regimes are all equally good (except for the money rule, which, it will be recalled, produces a needless recession). The coordinated response to a U.S. real demand shock involves monetary contraction in all three countries, just barely more so than the non-cooperative case. The effects are virtually identical.

We saw above that, even though the nominal GNP rule was superior to the money rule, rules in general did not fare well in comparison with discretion. But the regime evaluated was discretion by a benign far-sighted government that maximized the present discounted sum of future welfare. Those who argue the superiority of rules believe that governments left to themselves are in fact more inflation-prone than this, and thus need to be constrained from expanding. There are two natural ways of modelling the inflation bias under unconstrained discretion. The first is to assume that the government has a high discount rate -- in the extreme that it cares only <u>current</u> output and inflation -- for example because it is only expecting to be in office a short time or because the electorate only reacts to the current state of the economy. The second is to assume that the target rates of output and employment that the political system produces are higher than the level of potential output and the natural rate of

unemployment, for example because of the power of labor unions. Either approach can yield the result that a country will attain a higher value for its intertemporal objective function if the government is constrained from expanding.[8]

A credible constraint reduces public expectations of future inflation, thereby reducing the rate of actual inflation that corresponds to a given level of output. Of course this still leaves the fact that if there are unanticipated future disturbances, a rule prevents the government from responding. The choice between rules and discretion depends on the relative advantages of inflation-fighting credibility and the ability to respond to future disturbances [as shown in the Appendix]. It is ultimately an empirical question.

We now examine an inflationary bias that takes the form of the adoption of a target level of output that is one per cent above baseline. One can think of the experiment as the result of a change in political parties or of an increase in the power of labor unions. First we consider the effect of the inflationary bias in the case of non-cooperative discretion (by a government maximizing an intertemporal objective function with the same discount rate as above). Table 12.5 considers the bias in isolation (no disturbances). In each of the three countries, output initially goes up by almost one per cent, and the price level by somewhat less. In the United States, output comes back down slowly over time thereafter, while the price level continues to rise. This path is between the extremes of Japan, where output comes back down

rapidly [but the price level rises by 5.6 per cent], and Germany, where output stays high; the differences arise because the MSG model has market-clearing wages in Japan and hysteresis in Germany.

Now we consider the inflationary bias in conjunction with the same sorts of disturbances considered above. Because of linearity in the model, the effect of a given disturbance in the presence of the bias is simply the sum of the effect of the corresponding disturbance from Table 12.2 plus the effect of the bias in Table 12.5. In the case of the oil shock, for example, the result of the inflationary bias is that the discretionary government expands so that the fall in output (1.72 per cent) is smaller, and the increase in the price level (3.48 per cent) larger, than was the case when the political goal for output was the same as the baseline.

Unexpected changes in oil prices, money demand, or goods demand can, of course, be negative as easily as positive. When we were evaluating the quadratic loss function that corresponded to the experiments in Tables 12.1 through 12.4, it did not matter whether the disturbance was positive or negative. This is because, when the political goal (the value of the target variable in the absence of disturbances) coincides with the baseline path that is the reference point for the quadratic loss function, the absolute magnitudes of positive and negative deviations from the optimum value of the target variables are the same. But now that we are allowing the political goal to exceed the baseline, it is important to allow for negative shocks. A fall in goods demand in the

presence of an inflationary bias, for example, might coincidentally look much better than a rise in goods demand. To find the effects of a negative oil shock, negative money demand shock and negative goods demand shock, respectively, we subtract the corresponding effects in Table 12.3 from the output and inflation effects in Table 12.5, rather than adding them. Then, to evaluate the welfare under the discretionary regime, we average the two values of the loss function, to recognize that positive and negative shocks are equally likely. [We report welfare results based only on the loss function in the first year.]

In the presence of the inflationary bias, discretion is now considerably worse than the nominal GNP rule in the event of real demand shocks, because the government is unable to resist the urge to inflate [whereas in the absence of inflationary bias, discretion was only slightly worse than the rule]. In the event of money demand shocks, discretion is again considerably worse than the nominal GNP rule because the government is unable to resist the urge to inflate [whereas in the absence of inflationary bias, the two were equivalent]. Only in the event of supply shocks does discretion still dominate the nominal GNP rule, because the fall in output is small in the event of an increase in the price of oil. The superiority of discretion in the last case is relatively small, however. It seems likely that if money demand or real demand shocks are at all important, then the nominal GNP rule would result in higher welfare overall.

The drawbacks of discretion in the presence of the

inflationary bias change little when we allow the three countries to coordinate. [The results for coordination under the inflationary bias, without other disturbances, are given in Table 12.6. We then simply add the results to the effects of the various disturbances in Table 12.4 to see the results of coordination in the presence of both the inflationary bias and the disturbances.] Indeed, regardless of the disturbance, the loss function looks slightly worse than when the countries set their policies independently. The reason is that the Rogoff problem is exacerbated: the United States and Japan both inflate [Germany too, beginning in the second year], more than they do in the non-cooperative regime, where they are inhibited by the threat of depreciated currencies. The advantages of pre-committing to a nominal target as a way of resisting the temptation to inflate thus look even greater.

The Proposal for Coordination by International Nominal Targeting (INT)

The version of nominal-GNP targeting that we have evaluated in this paper is a restricted one. As with the version of money supply targeting that was evaluated, it was assumed that the countries eternally fixed their rate of nominal growth. There was no sense in which the setting of nominal GNP reported in Table 4 was cooperative, unless one wished to think of the simultaneous decision by the U.S., Japan and Germany to switch to a nominal GNP rule to be a coordinated decision. In the case considered in Table

3, where the countries did coordinate, we assumed that the jointly-optimizing policy could be chosen after all disturbances occurred, so that it was immaterial whether the countries chose to express the cooperative policy settings in terms of money supplies, nominal GNPs, or ultimate objectives.

I have proposed a cooperative international version of a nominal-GNP rule that I call INT, for International Nominal Targeting, which is intended to be robust with respect to disturbances that occur after a cooperative agreement is set.[9] According to the proposal, at each G-7 meeting, the national authorities would (a) loosely commit themselves to broad target ranges for their collective and individual rates of growth of nominal demand, for five years into the future, and (b) commit themselves to somewhat narrower targets for the coming year. It would be up to each country how to attain the target to which it committed, though the tools of monetary policy must presumably take precedence over the tools of fiscal policy for purposes of short-run adjustments. The targets would be publicly announced, in the manner that the Chairman of the Federal Reserve Board announced to the U.S. Congress target ranges for the M1 money supply until recently. If a country's rate of growth of nominal demand turned out to err significantly in one direction or the other, the fact would be noted disapprovingly at the next G-7 meeting.[10]

The next step in future research is to add to the list of regimes the cooperative setting of nominal GNPs and the cooperative setting of money supplies. This could be done both using the

theoretical context of the Appendix and using the simulation approach of the MSG model.

To study cooperative setting of targets, in a way that is meaningfully distinct from cooperative discretion, requires that we have the sort of long-lasting disturbances studied here that push the world economy away from its optimum goals, which governments then respond to in a discretionary way (with or without coordination), but also that we have subsequent short-term disturbances in addition. Only if there are disturbances subsequent to the cooperative agreement will it make a difference whether the decisions that are made at the first stage are expressed in terms of nominal GNP, the money supply, or some other variable. [The option of having the precise coordinated policies conditional on the revealed second-stage disturbances is assumed to be not a practical option at all. For a government's commitment to be credible vis-a-vis its partners in international cooperation, it must be explicit and observable. There may be an analogy here with the inadmissability of a government's attempt to commit to a low-inflation policy when it is not credible vis-a-vis the public because it is not time-consistent.] The goal would be to show, when the long-term situation is one of recession for example, that if the G-7 wish to reap the potential benefits of joint expansion, they are better off seeking to do so by agreeing on expansion in terms of nominal GNP than in terms of M1, because the former strategy is much more robust to possible future disturbances.

APPENDIX

In this appendix we compare three possible policy regimes: (1) floating exchange rates, with full discretion by national policy-makers (the current regime), (2) a rigid money supply rule, and (3) a rigid nominal GNP rule. The approach, incorporating the advantages both to rules and discretion, follows Rogoff (1985b) and Fischer (1988a), who in turn follow Kydland and Prescott, and Barro and Gordon.

We assume an aggregate supply relationship:

(A1) $y = y^* + b(p-p^e) + u$,

where y represents output, y^* potential output, p the price level, p^e the expected price level (or they could be the actual and expected inflation rates, respectively), and u a supply disturbance, with all variables expressed as logs.

We represent economic welfare by a quadratic loss function in output and the price level:

(A2) $L = p^2 + (y - ky^*)^2$,

where we have assigned a unit weight to the inflation objective,[11] and we assume that the lagged or expected price level relative to which p is measured can be normalized to zero. We impose $k > 1$, which builds in an expansionary bias to discretionary policy-making.

(A3) $L = p^2 + [y^*(1-k) + b(p-p^e) + u]^2$.

1. Discretionary policy

Under full discretion, the policy-maker each period chooses

Aggregate Demand so as to minimize that period's L, with p^e given.

(A4) $dL/dp = 2p + 2[y^*(1-k) + b(p-p^e) + u]b = 0.$

(A5) $p\,[1+b^2] = [-y^*(1-k)b + b^2p^e - bu]$.

Under rational expectations,

(A6) $p^e = Ep = -y^*(1-k)b.$

So we can solve (A5) for the price level:

(A7) $p = -y^*(1-k)b - u(b/1+b^2)$

From (A2), the expected loss function then works out to:

(A8) $EL = (1 + b^2)[(1-k)y^*]^2 + var(u)/(1+b^2).$

The first term represents the inflationary bias in the system, while the second represents the effect of the supply disturbance after the authorities have chosen the optimal split between inflation and output.[12]

2. Money rule

To consider alternative regimes, we must be explicit about the money market equilibrium condition. (In case 1, it was implicit that the money supply m was the variable that the authorities were using to control demand.)

(A9) $m = p + y - v,$

where v represents velocity shocks. (We assume v uncorrelated with u.) If the authorities pre-commit to a fixed money growth rule in order to reduce expected inflation in long-run equilibrium, then they must give up on affecting y. The optimal money growth rate is the one that sets Ep at the target value for p, namely 0. Thus they will set the money supply m at Ey, which in this case is y^*. The Aggregate Demand equation thus becomes

(A10) $p + y = y^* + v.$

Combining with the Aggregate Supply relationship (A1), the equilibrium is given by

(A11) $y = y^* + (u + bv)/(1+b), \qquad p = (v - u)/(1+b).$

Substituting into (A2), the expected loss function is

(A12) $EL = (1-k)^2y^{*2} + \{2var(u)/(1+b)^2 + (1+b^2)var(v)/(1+b)^2\}.$

The first term is smaller than the corresponding term in the discretion case, because the pre-commitment reduces expected inflation; but the second term is probably larger, because the authorities have given up the ability to respond to money demand shocks and so var(v) enters. Which regime is better depends on how big the shocks are, and on how big b is.

3. Nominal GNP rule

In the case of a nominal GNP rule, the authorities vary the money supply in such a way as to accommodate velocity shocks. (A10) is replaced by the condition that p + y is constant. The solution is the same as in case 2, but with the v disturbance dropped. Thus the expected loss collapses from (A12) to:

(A13) $EL = (1-k)^2y^{*2} + 2var(u)/(1+b)^2.$

The expected loss in (A13) is less than in (A12). We thus see the central theorem: the nominal GNP rule unambiguously dominates the money rule case. It is still not possible, without knowing var(u) and b, the size of the supply shocks and the flatness of the short-run supply relationship, to say that the rule dominates discretion (to compare the expected losses in A8 and A13). For this question, we need the full model simulations described in the text.

It is quite likely, especially if the variance of u is large, that an absolute commitment to a rule would be unwisely constraining. Hence the argument for a target zone rather than a single number, and for subjecting the central bank chairman to a mere loss of reputation if he misses the target rather than a firing squad. But it seems clear that, to whatever extent the country chooses to commit to a nominal anchor, nominal GNP dominates the money supply as the candidate for anchor.

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Footnotes

1. This list did not appear in the communique, but rather in comments to the press by the U.S. Treasury's Assistant Secretary David Mulford. Funabashi (1988, esp. p.130 ff.) offers a fascinating account of the machinations of the G-7 mechanism from 1985 to 1987.

2. For a review of the literature on international macroeconomic policy coordination, see Fischer (1988b).

3. For skeptical views on international coordination, see Feldstein (1983, 1988) and Frankel (1988).

4. Rogoff, Kenneth, 1985, "International Macroeconomic Policy Coordination May Be Counterproductive," Journal of International Economics, February, 18, 199-217.

5. Jeffrey Frankel and Katharine Rockett, "International Macroeconomic Policy Coordination When Policy-makers Do Not Agree on the True Model," American Economic Review, June 1988, 318-340. See also Holtham and Hughes Hallett (1987).

6. In the domestic context, nominal GNP targeting has many adherents. In the international context, Miller and Williamson (1987) propose targeting nominal demand as part of their "blueprint" for exchange rate target zones.

7. Analogously, in the context of international coordination, we can take as given by the political process the degree of commitment to coordination.

8. For a review of the literature, see Fischer (1988a).

9. Frankel (1989).

10. There is a reason for choosing nominal demand (defined as GNP minus the trade balance) as the target variable, in place of nominal GNP, even though the latter is a more familiar concept. In the event of a recession, countries need to be discouraged from the temptation to accomplish their expansion of output through net foreign demand -- for example, through protectionist measures -- as opposed to domestic demand.

11. The Appendix to Frankel (1989) allows the weights on the output and inflation objectives to differ.

12. Note that the higher is b, the greater the inflationary bias. The reason is that, under rational expectations, people know that the government will be more tempted to expand, the flatter is the supply relationship.

/ A

Table : World Model msgg23/86 29 / 9 /1989
Money Rule
Oil Price Shock (100%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-1.79	-0.53	0.29	0.76	0.99	3.05
Inflation	D	3.57	-2.15	-1.44	-0.89	-0.47	4.52
Current account	%Y	-0.22	-0.14	-0.08	-0.04	-0.01	0.27
Budget deficit	%Y	0.56	0.16	-0.09	-0.24	-0.31	0.95
Trade Bal	%Y	-0.03	-0.01	-0.01	-0.00	-0.00	
Money	%	0.00	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	2.96	1.43	0.35	-0.36	-0.76	
Japanese Economy							
Output	%Y	-1.07	-0.07	-0.01	0.03	0.05	1.12
Inflation	D	2.84	-2.15	-0.58	-0.40	-0.24	3.64
Current account	%Y	0.05	-0.02	-0.06	-0.08	-0.08	0.23
Budget deficit	%Y	0.34	0.02	0.00	-0.01	-0.02	0.35
Exch Rate $/yen	%	0.38	0.46	0.91	1.06	1.05	2.45
Real Exch Rate	%	-0.39	-0.28	1.13	1.80	2.04	4.67
Real Trade Bal	%Y	-0.28	-0.13	-0.16	-0.16	-0.14	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	2.89	0.98	0.20	-0.35	-0.66	
German Economy							
Output	%Y	-0.29	-0.24	0.03	0.32	0.58	3.63
Inflation	D	2.46	-1.08	-1.03	-0.78	-0.53	3.03
Current account	%Y	0.33	0.23	0.11	0.04	-0.01	0.43
Budget deficit	%Y	0.09	0.08	-0.01	-0.10	-0.18	1.14
Exch Rate $/gdr	%	1.23	0.91	0.43	0.06	-0.21	2.77
Real Exch Rate	%	-0.08	0.91	0.92	0.66	0.31	4.55
Real Trade Bal	%Y	-0.31	-0.28	-0.20	-0.10	-0.02	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	3.28	1.91	0.72	-0.09	-0.56	
ROECD Economies							
Output	%Y	-1.35	-0.28	0.25	0.55	0.71	2.34
Inflation	D	3.38	-1.92	-1.24	-0.78	-0.45	4.18
Current account	%Y	0.20	0.14	0.06	-0.01	-0.04	0.27
Budget deficit	%Y	0.42	0.09	-0.08	-0.17	-0.22	0.73
Exch Rate $/roe	%	1.52	0.68	0.10	-0.26	-0.48	2.87
Real Exch Rate	%	1.59	0.78	0.36	0.09	-0.12	2.72
Real Trade Bal	%Y	-0.20	-0.09	-0.06	-0.05	-0.03	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	3.80	2.01	0.71	-0.13	-0.62	

Table : World Model msgg23/86 29 / 9 /1989
Money Rule
U.S. Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-1.21	0.20	0.02	-0.07	-0.11	1.26
Inflation	D	-0.92	0.48	0.29	0.16	0.08	1.09
Current account	%Y	-0.25	0.05	0.01	-0.01	-0.02	0.26
Budget deficit	%Y	0.38	-0.06	-0.01	0.02	0.04	0.39
Trade Bal	%Y	-0.07	0.03	0.00	-0.01	-0.01	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	4.87	-0.38	-0.19	-0.07	0.00	
Japanese Economy							
Output	%Y	0.12	0.01	0.01	0.00	0.00	0.12
Inflation	D	0.18	-0.17	-0.04	0.02	0.02	0.25
Current account	%Y	0.04	-0.02	-0.02	-0.02	-0.01	0.05
Budget deficit	%Y	-0.04	-0.00	-0.00	-0.00	-0.00	0.04
Exch Rate $/yen	%	-3.94	0.52	0.11	-0.03	-0.07	3.98
Real Exch Rate	%	-2.95	0.95	0.21	-0.09	-0.19	3.13
Real Trade Bal	%Y	0.10	-0.06	-0.02	-0.01	0.00	
Money	%	0.00	0.00	-0.00	-0.00	0.00	
Int Rate (sh)	D	0.41	0.04	-0.05	-0.03	0.01	
German Economy							
Output	%Y	0.36	-0.08	-0.01	0.05	0.09	0.49
Inflation	D	0.25	-0.16	-0.12	-0.05	-0.01	0.33
Current account	%Y	0.15	0.01	-0.01	-0.01	-0.00	0.16
Budget deficit	%Y	-0.11	0.02	0.00	-0.02	-0.03	0.15
Exch Rate $/gdr	%	-3.46	0.42	0.01	-0.12	-0.14	3.50
Real Exch Rate	%	-2.36	0.93	0.12	-0.23	-0.35	2.68
Real Trade Bal	%Y	0.05	-0.06	-0.02	0.01	0.02	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.99	0.03	-0.06	-0.05	-0.01	
ROECD Economies							
Output	%Y	0.26	-0.04	0.01	0.06	0.07	0.29
Inflation	D	0.30	-0.23	-0.11	-0.03	0.01	0.39
Current account	%Y	0.19	-0.06	-0.02	-0.00	0.01	0.21
Budget deficit	%Y	-0.08	0.01	-0.00	-0.02	-0.02	0.09
Exch Rate $/roe	%	-3.63	0.50	0.04	-0.11	-0.14	3.67
Real Exch Rate	%	-2.57	1.02	0.13	-0.22	-0.33	2.86
Real Trade Bal	%Y	0.19	-0.10	-0.04	-0.00	0.01	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.74	0.09	-0.04	-0.04	-0.01	

Table 16: World Model msgg23/86 29 / 9 /1989
Money Rule
U.S. Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	1.33	-0.25	-0.15	-0.07	-0.03	1.36
Inflation	D	0.52	-0.18	-0.14	-0.11	-0.07	0.58
Current account	%Y	-0.42	-0.02	-0.03	-0.02	-0.02	0.43
Budget deficit	%Y	-0.41	0.08	0.05	0.02	0.01	0.43
Trade Bal	%Y	-0.28	0.01	0.00	0.00	0.00	
Money	%	0.00	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	3.19	0.21	0.11	0.04	-0.01	
Japanese Economy							
Output	%Y	0.42	0.00	0.00	0.01	0.01	0.43
Inflation	D	0.33	-0.16	-0.10	-0.06	-0.04	0.39
Current account	%Y	0.18	-0.00	-0.01	-0.01	-0.01	0.18
Budget deficit	%Y	-0.13	-0.00	-0.00	-0.00	-0.00	0.13
Exch Rate $/yen	%	-1.79	0.21	0.14	0.13	0.14	1.87
Real Exch Rate	%	-2.08	-0.00	-0.00	0.05	0.11	2.14
Real Trade Bal	%Y	0.17	-0.03	-0.03	-0.02	-0.02	
Money	%	0.00	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	1.20	0.27	0.12	0.04	-0.01	
German Economy							
Output	%Y	0.54	-0.03	0.01	0.05	0.08	0.73
Inflation	D	0.36	-0.12	-0.14	-0.10	-0.07	0.43
Current account	%Y	0.27	0.05	0.02	0.01	0.01	0.28
Budget deficit	%Y	-0.17	0.01	-0.00	-0.01	-0.02	0.23
Exch Rate $/gdr	%	-1.43	0.29	0.15	0.09	0.06	1.47
Real Exch Rate	%	-1.67	0.16	0.04	-0.02	-0.04	1.71
Real Trade Bal	%Y	0.09	-0.05	-0.03	-0.02	-0.01	
Money	%	0.00	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	1.47	0.35	0.18	0.07	0.01	
ROECD Economies							
Output	%Y	0.51	-0.04	-0.02	0.01	0.03	0.53
Inflation	D	0.40	-0.14	-0.13	-0.10	-0.06	0.46
Current account	%Y	0.29	0.00	0.01	0.00	0.00	0.29
Budget deficit	%Y	-0.16	0.01	0.01	-0.00	-0.01	0.17
Exch Rate $/roe	%	-1.48	0.32	0.15	0.07	0.04	1.53
Real Exch Rate	%	-1.74	0.21	0.07	0.01	-0.01	1.75
Real Trade Bal	%Y	0.23	-0.04	-0.03	-0.02	-0.01	
Money	%	0.00	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	1.40	0.37	0.19	0.08	0.01	

Table 10: World Model msgg23/86 29 / 9 /1989
Money Rule
Japanese Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.02	0.00	0.00	0.01	0.02	0.05
Inflation	D	0.08	-0.02	-0.03	-0.02	-0.02	0.09
Current account	%Y	-0.00	-0.01	-0.01	-0.00	-0.00	0.01
Budget deficit	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.02
Trade Bal	%Y	0.00	-0.01	-0.00	-0.00	-0.00	
Money	%	-0.00	-0.00	0.00	0.00	0.00	
Int Rate (sh)	D	0.04	0.06	0.03	0.01	-0.00	
Japanese Economy							
Output	%Y	-1.10	-0.07	-0.05	-0.04	-0.03	1.11
Inflation	D	-0.95	0.86	0.07	0.02	0.01	1.29
Current account	%Y	0.02	0.02	0.01	0.00	-0.00	0.03
Budget deficit	%Y	0.35	0.02	0.02	0.01	0.01	0.35
Exch Rate $/yen	%	4.60	-0.45	-0.15	-0.02	0.04	4.63
Real Exch Rate	%	3.72	-0.56	-0.17	-0.00	0.07	3.77
Real Trade Bal	%Y	-0.42	0.06	0.02	0.00	-0.01	
Money	%	0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	5.09	-0.25	-0.10	-0.04	-0.02	
German Economy							
Output	%Y	-0.05	0.00	0.01	0.01	0.02	0.11
Inflation	D	0.08	-0.04	-0.02	-0.02	-0.01	0.09
Current account	%Y	-0.03	0.00	0.00	0.00	0.00	0.03
Budget deficit	%Y	0.02	-0.00	-0.00	-0.00	-0.00	0.03
Exch Rate $/gdr	%	-0.08	0.01	0.00	-0.00	-0.01	0.09
Real Exch Rate	%	-0.09	0.01	0.00	-0.00	-0.00	0.14
Real Trade Bal	%Y	-0.02	-0.01	-0.00	-0.00	0.00	
Money	%	-0.00	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	-0.05	0.06	0.04	0.01	-0.00	
ROECD Economies							
Output	%Y	-0.03	0.01	0.02	0.02	0.02	0.05
Inflation	D	0.08	-0.05	-0.02	-0.01	-0.01	0.09
Current account	%Y	-0.00	-0.00	0.00	0.00	-0.00	0.00
Budget deficit	%Y	0.01	-0.00	-0.01	-0.01	-0.01	0.02
Exch Rate $/roe	%	-0.02	0.00	-0.00	-0.01	-0.01	0.05
Real Exch Rate	%	-0.02	-0.00	-0.01	-0.01	-0.01	0.05
Real Trade Bal	%Y	-0.00	-0.01	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	0.02	0.06	0.03	0.01	-0.00	

Table 16: World Model msgg23/86 29 / 9 /1989
Money Rule
Japanese Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.05	-0.02	0.01	0.03	0.04	0.11
Inflation	D	0.15	-0.07	-0.06	-0.04	-0.02	0.18
Current account	%Y	0.02	-0.01	-0.00	-0.00	0.00	0.02
Budget deficit	%Y	-0.01	0.01	-0.00	-0.01	-0.01	0.03
Trade Bal	%Y	0.03	-0.01	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	0.25	0.08	0.03	0.00	-0.02	
Japanese Economy							
Output	%Y	1.55	0.00	0.01	0.02	0.02	1.55
Inflation	D	0.51	-0.60	0.05	0.01	0.00	0.79
Current account	%Y	-0.17	0.02	0.01	0.00	-0.00	0.17
Budget deficit	%Y	-0.49	-0.00	-0.00	-0.01	-0.01	0.49
Exch Rate $/yen	%	2.97	-0.42	-0.18	-0.08	-0.04	3.00
Real Exch Rate	%	3.49	-0.58	-0.24	-0.09	-0.03	3.55
Real Trade Bal	%Y	-0.60	0.06	0.03	0.01	0.01	
Money	%	0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	3.63	-0.16	-0.07	-0.04	-0.03	
German Economy							
Output	%Y	0.04	-0.01	0.02	0.03	0.04	0.20
Inflation	D	0.14	-0.08	-0.05	-0.03	-0.02	0.17
Current account	%Y	0.03	0.01	0.01	0.01	0.00	0.03
Budget deficit	%Y	-0.01	0.00	-0.01	-0.01	-0.01	0.06
Exch Rate $/gdr	%	0.00	0.04	0.03	0.01	-0.01	0.11
Real Exch Rate	%	-0.01	0.04	0.03	0.01	-0.00	0.23
Real Trade Bal	%Y	-0.01	-0.01	-0.01	-0.00	0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.21	0.09	0.05	0.01	-0.01	
ROECD Economies							
Output	%Y	0.07	-0.01	0.02	0.02	0.03	0.10
Inflation	D	0.14	-0.08	-0.05	-0.03	-0.02	0.17
Current account	%Y	0.04	0.00	0.00	0.00	0.00	0.04
Budget deficit	%Y	-0.02	0.00	-0.00	-0.01	-0.01	0.03
Exch Rate $/roe	%	0.06	0.02	0.01	-0.00	-0.01	0.12
Real Exch Rate	%	0.07	0.02	0.01	0.00	-0.00	0.11
Real Trade Bal	%Y	0.02	-0.01	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	0.29	0.09	0.05	0.01	-0.01	

Table : World Model msgg23/86 29 / 9 /1989
Money Rule
German Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.06	0.01	0.01	0.01	0.00	0.14
Inflation	D	0.09	-0.07	-0.02	0.01	0.02	0.12
Current account	%Y	-0.01	-0.00	0.01	0.01	0.01	0.04
Budget deficit	%Y	0.02	0.00	-0.00	-0.00	-0.00	0.04
Trade Bal	%Y	0.00	-0.00	0.01	0.01	0.01	
Money	%	-0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	-0.01	0.03	-0.01	-0.01	0.01	
Japanese Economy							
Output	%Y	-0.13	0.01	-0.00	-0.01	-0.01	0.16
Inflation	D	0.05	-0.04	-0.00	0.01	0.01	0.06
Current account	%Y	-0.03	0.00	0.01	0.01	0.01	0.07
Budget deficit	%Y	0.04	-0.00	0.00	0.00	0.00	0.05
Exch Rate $/yen	%	-0.18	0.01	0.00	-0.01	-0.03	0.22
Real Exch Rate	%	-0.22	0.02	0.03	0.02	-0.00	0.28
Real Trade Bal	%Y	-0.01	-0.00	0.01	0.01	0.01	
Money	%	-0.00	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	-0.20	0.04	0.01	0.01	0.02	
German Economy							
Output	%Y	-1.15	0.17	-0.11	-0.26	-0.33	1.84
Inflation	D	-1.07	0.64	0.40	0.20	0.10	1.33
Current account	%Y	0.18	0.00	-0.01	-0.01	-0.01	0.18
Budget deficit	%Y	0.36	-0.05	0.04	0.08	0.10	0.58
Exch Rate $/gdr	%	4.49	-0.53	-0.03	0.18	0.27	4.65
Real Exch Rate	%	3.59	-0.99	-0.03	0.40	0.58	4.42
Real Trade Bal	%Y	-0.62	0.16	0.04	-0.02	-0.04	
Money	%	0.00	-0.00	-0.00	0.00	0.00	
Int Rate (sh)	D	5.01	-0.47	-0.21	-0.09	-0.03	
ROECD Economies							
Output	%Y	0.19	-0.09	0.09	0.10	0.08	0.28
Inflation	D	0.42	-0.44	-0.06	0.04	0.05	0.61
Current account	%Y	0.13	-0.09	-0.04	-0.02	-0.01	0.16
Budget deficit	%Y	-0.06	0.03	-0.03	-0.03	-0.02	0.09
Exch Rate $/roe	%	0.53	-0.03	0.08	0.15	0.19	0.97
Real Exch Rate	%	0.61	0.01	-0.04	0.04	0.11	0.90
Real Trade Bal	%Y	0.08	-0.10	-0.03	-0.01	-0.01	
Money	%	0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.55	-0.08	-0.08	-0.05	-0.01	

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Table : World Model msgg23/86 29 / 9 /1989

Money Rule

German Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.02	-0.01	0.00	0.01	0.02	0.05
Inflation	D	0.09	-0.04	-0.03	-0.02	-0.01	0.10
Current account	%Y	0.00	-0.01	-0.00	0.00	0.00	0.02
Budget deficit	%Y	-0.01	0.00	-0.00	-0.00	-0.00	0.01
Trade Bal	%Y	0.03	-0.00	-0.00	0.00	0.00	
Money	%	0.00	-0.00	0.00	0.00	0.00	
Int Rate (sh)	D	0.15	0.05	0.02	0.00	-0.01	
Japanese Economy							
Output	%Y	0.01	0.00	0.00	0.00	0.00	0.01
Inflation	D	0.07	-0.04	-0.01	-0.01	-0.01	0.08
Current account	%Y	0.02	-0.00	-0.00	-0.00	0.00	0.02
Budget deficit	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/yen	%	-0.05	0.00	0.02	0.02	0.02	0.06
Real Exch Rate	%	-0.07	-0.02	0.02	0.03	0.04	0.10
Real Trade Bal	%Y	0.01	-0.01	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	0.10	0.04	0.02	0.00	-0.01	
German Economy							
Output	%Y	0.84	-0.10	-0.01	0.02	0.03	0.85
Inflation	D	0.15	-0.10	-0.05	-0.02	-0.01	0.19
Current account	%Y	-0.43	0.01	0.00	-0.00	-0.01	0.43
Budget deficit	%Y	-0.26	0.03	0.00	-0.01	-0.01	0.27
Exch Rate $/gdr	%	1.63	-0.17	-0.09	-0.05	-0.03	1.65
Real Exch Rate	%	1.90	-0.13	-0.10	-0.07	-0.05	1.92
Real Trade Bal	%Y	-0.84	0.03	0.03	0.02	0.02	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	1.96	-0.04	-0.02	-0.02	-0.02	
ROECD Economies							
Output	%Y	0.20	-0.05	0.02	0.04	0.04	0.22
Inflation	D	0.23	-0.17	-0.06	-0.02	-0.01	0.29
Current account	%Y	0.10	-0.02	-0.01	-0.00	-0.00	0.10
Budget deficit	%Y	-0.06	0.01	-0.01	-0.01	-0.01	0.07
Exch Rate $/roe	%	0.37	-0.00	-0.00	0.00	0.01	0.37
Real Exch Rate	%	0.42	0.04	-0.02	-0.03	-0.02	0.42
Real Trade Bal	%Y	0.06	-0.04	-0.01	-0.01	-0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.52	0.05	0.02	-0.00	-0.01	

Table 22 : World Model msgg23/86 29 / 9 /1989
Optimal Non-Cooperative Rule (Discretion)
Oil Price Shock (100%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-2.47	0.53	0.53	0.50	0.45	2.79
Inflation	D	3.09	-0.82	-0.81	-0.76	-0.68	3.45
Current account	%Y	-0.40	0.05	-0.00	-0.01	-0.01	0.40
Budget deficit	%Y	0.77	-0.16	-0.17	-0.16	-0.14	0.87
Trade Bal	%Y	-0.05	0.05	-0.00	-0.01	-0.01	
Money	%	-4.27	3.33	2.65	1.90	1.14	
Int Rate (sh)	D	8.18	-0.98	-1.19	-1.22	-1.15	
Japanese Economy							
Output	%Y	-0.61	-0.03	-0.00	0.01	0.02	0.62
Inflation	D	3.30	0.14	0.01	-0.08	-0.13	3.31
Current account	%Y	0.07	-0.02	-0.04	-0.04	-0.03	0.10
Budget deficit	%Y	0.19	0.01	0.00	-0.00	-0.01	0.20
Exch Rate $/yen	%	-3.25	0.36	-1.13	-2.00	-2.61	14.23
Real Exch Rate	%	-3.16	1.60	0.94	0.75	0.68	4.10
Real Trade Bal	%Y	-0.13	-0.13	-0.07	-0.04	-0.03	
Money	%	-0.16	3.12	3.68	3.79	3.71	
Int Rate (sh)	D	4.57	0.51	-0.32	-0.60	-0.67	
German Economy							
Output	%Y	-0.10	0.03	0.04	0.05	0.05	0.20
Inflation	D	2.44	-0.74	-0.99	-1.11	-1.16	3.17
Current account	%Y	0.58	0.11	-0.05	-0.10	-0.11	0.64
Budget deficit	%Y	0.03	-0.01	-0.01	-0.01	-0.01	0.06
Exch Rate $/gdr	%	0.74	2.43	1.36	1.42	1.88	20.70
Real Exch Rate	%	-0.06	1.86	0.70	0.43	0.42	2.56
Real Trade Bal	%Y	-0.53	-0.16	-0.09	-0.08	-0.07	
Money	%	-1.70	1.64	1.53	0.74	-0.35	
Int Rate (sh)	D	6.49	0.08	-1.24	-1.68	-1.77	
ROECD Economies							
Output	%Y	-1.15	-0.47	0.34	0.69	0.78	2.10
Inflation	D	3.57	-2.59	-1.25	-0.51	-0.14	4.61
Current account	%Y	0.30	-0.11	0.01	0.07	0.10	0.43
Budget deficit	%Y	0.36	0.15	-0.11	-0.22	-0.24	0.66
Exch Rate $/roe	%	0.22	4.10	1.92	0.74	-0.02	8.73
Real Exch Rate	%	0.85	3.07	0.17	-0.90	-1.15	3.85
Real Trade Bal	%Y	-0.12	-0.35	-0.05	0.09	0.13	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	4.30	1.19	0.00	-0.45	-0.58	

Table 26: World Model msgg23/86 29 / 9 /1989
Optimal Non-Cooperative Rule (Discretion)
U.S. Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Inflation	D	-0.01	0.00	0.00	0.00	0.00	0.01
Current account	%Y	-0.02	-0.00	-0.00	-0.00	-0.00	0.02
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Trade Bal	%Y	-0.01	0.00	0.00	0.00	0.00	
Money	%	4.87	-0.01	-0.00	0.00	0.01	
Int Rate (sh)	D	0.22	0.00	0.00	0.00	0.00	
Japanese Economy							
Output	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	0.00	0.00	0.00	0.00	0.00	0.00
Current account	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Budget deficit	%Y	0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/yen	%	-0.11	0.01	0.00	0.00	0.00	0.11
Real Exch Rate	%	-0.10	0.02	0.01	0.00	0.00	0.10
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.06	-0.00	0.00	0.01	0.01	
Int Rate (sh)	D	0.10	0.01	0.00	-0.00	-0.00	
German Economy							
Output	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	-0.00	0.00	0.00	0.00	0.00	0.01
Current account	%Y	0.02	0.00	0.00	0.00	0.00	0.02
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/gdr	%	-0.04	0.01	0.00	-0.00	0.00	0.05
Real Exch Rate	%	-0.04	0.01	0.00	-0.00	0.00	0.04
Real Trade Bal	%Y	-0.01	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.10	-0.01	0.00	0.01	0.01	
Int Rate (sh)	D	0.16	0.02	0.00	-0.00	-0.00	
ROECD Economies							
Output	%Y	0.03	-0.00	0.00	0.00	0.00	0.03
Inflation	D	0.03	-0.02	-0.01	-0.00	-0.00	0.04
Current account	%Y	0.02	-0.00	-0.00	-0.00	-0.00	0.02
Budget deficit	%Y	-0.01	0.00	-0.00	-0.00	-0.00	0.01
Exch Rate $/roe	%	-0.13	0.02	0.01	0.01	0.01	0.15
Real Exch Rate	%	-0.11	0.03	0.01	-0.00	-0.00	0.11
Real Trade Bal	%Y	0.01	-0.01	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.07	0.01	0.00	-0.00	-0.00	

Table 26 : World Model msgg23/86 29 / 9 /1989
Optimal Non-Cooperative Rule (Discretion)
U.S. Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.19	-0.10	-0.08	-0.06	-0.06	0.27
Inflation	D	-0.22	0.15	0.12	0.10	0.09	0.32
Current account	%Y	-0.63	-0.00	-0.02	-0.02	-0.02	0.63
Budget deficit	%Y	-0.06	0.03	0.02	0.02	0.02	0.09
Trade Bal	%Y	-0.34	0.03	0.01	0.01	0.01	
Money	%	-4.32	-0.24	-0.05	0.08	0.18	
Int Rate (sh)	D	7.29	0.16	0.06	0.02	0.01	
Japanese Economy							
Output	%Y	-0.02	-0.01	-0.01	-0.01	-0.01	0.03
Inflation	D	0.13	0.05	0.05	0.04	0.03	0.16
Current account	%Y	0.20	-0.01	-0.02	-0.02	-0.01	0.20
Budget deficit	%Y	0.01	0.00	0.00	0.00	0.00	0.01
Exch Rate $/yen	%	-3.52	0.33	0.04	0.00	0.03	3.64
Real Exch Rate	%	-3.31	0.54	0.20	0.11	0.09	3.38
Real Trade Bal	%Y	0.08	-0.07	-0.04	-0.03	-0.02	
Money	%	-2.02	-0.11	0.16	0.27	0.32	
Int Rate (sh)	D	3.45	0.45	0.10	-0.01	-0.03	
German Economy							
Output	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Inflation	D	-0.13	0.11	0.10	0.08	0.06	0.22
Current account	%Y	0.50	0.08	0.02	0.00	0.00	0.51
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/gdr	%	-1.45	0.41	0.05	-0.01	0.03	1.72
Real Exch Rate	%	-1.35	0.42	0.06	-0.00	0.02	1.48
Real Trade Bal	%Y	-0.27	-0.03	-0.02	-0.01	-0.02	
Money	%	-3.28	-0.35	0.01	0.18	0.26	
Int Rate (sh)	D	5.43	0.53	0.12	-0.02	-0.05	
ROECD Economies							
Output	%Y	0.84	-0.11	0.05	0.13	0.16	0.91
Inflation	D	0.96	-0.61	-0.31	-0.14	-0.04	1.19
Current account	%Y	0.54	-0.10	-0.06	-0.03	-0.01	0.56
Budget deficit	%Y	-0.26	0.04	-0.01	-0.04	-0.05	0.28
Exch Rate $/roe	%	-4.29	0.62	0.30	0.24	0.28	4.92
Real Exch Rate	%	-3.57	1.06	0.25	-0.06	-0.15	3.74
Real Trade Bal	%Y	0.45	-0.20	-0.10	-0.05	-0.03	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	2.38	0.49	0.11	-0.03	-0.06	

Table 23 : World Model msgg23/86 29 / 9 /1989
Optimal Non-Cooperative Rule (Discretion)
Japanese Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Current account	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.02	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	0.02	0.00	0.00	-0.00	-0.00	
Japanese Economy							
Output	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	-0.02	0.01	0.01	0.01	0.00	0.03
Current account	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/yen	%	0.24	-0.02	-0.01	-0.01	-0.01	0.26
Real Exch Rate	%	0.23	-0.03	-0.01	-0.01	-0.00	0.23
Real Trade Bal	%Y	-0.03	0.00	0.00	0.00	0.00	
Money	%	4.81	-0.00	0.00	0.01	0.01	
Int Rate (sh)	D	0.29	-0.01	-0.00	0.00	0.00	
German Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Current account	%Y	0.00	0.00	0.00	-0.00	-0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/gdr	%	-0.01	0.00	0.00	0.01	0.01	0.07
Real Exch Rate	%	-0.01	0.00	0.00	0.00	0.00	0.01
Real Trade Bal	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.01	0.00	-0.00	-0.00	-0.00	
ROECD Economies							
Output	%Y	0.00	-0.00	0.00	0.00	0.00	0.00
Inflation	D	0.01	-0.01	-0.00	-0.00	-0.00	0.01
Current account	%Y	0.00	-0.00	0.00	0.00	0.00	0.00
Budget deficit	%Y	-0.00	0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/roe	%	-0.01	0.00	0.00	0.00	-0.00	0.02
Real Exch Rate	%	-0.01	0.00	0.00	-0.00	-0.00	0.01
Real Trade Bal	%Y	0.00	-0.00	-0.00	0.00	0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.01	0.00	0.00	0.00	-0.00	

Table 26 : World Model msgg23/86 29 / 9 /1989
Optimal Non-Cooperative Rule (Discretion)
Japanese Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.11	0.02	0.03	0.03	0.03	0.13
Inflation	D	0.14	-0.04	-0.04	-0.04	-0.04	0.16
Current account	%Y	-0.01	-0.01	-0.01	-0.00	-0.00	0.02
Budget deficit	%Y	0.03	-0.01	-0.01	-0.01	-0.01	0.04
Trade Bal	%Y	0.03	-0.01	-0.00	-0.00	-0.00	
Money	%	-0.55	0.04	0.07	0.06	0.03	
Int Rate (sh)	D	0.83	0.08	0.00	-0.03	-0.05	
Japanese Economy							
Output	%Y	0.12	-0.08	-0.05	-0.03	-0.02	0.17
Inflation	D	-0.68	0.45	0.26	0.18	0.13	0.88
Current account	%Y	-0.14	0.05	0.02	0.01	0.00	0.15
Budget deficit	%Y	-0.04	0.03	0.02	0.01	0.01	0.05
Exch Rate $/yen	%	8.16	-0.83	-0.45	-0.38	-0.42	8.67
Real Exch Rate	%	7.67	-1.12	-0.46	-0.18	-0.06	7.76
Real Trade Bal	%Y	-1.09	0.13	0.06	0.03	0.01	
Money	%	-6.20	-0.13	0.03	0.18	0.30	
Int Rate (sh)	D	9.82	-0.30	-0.07	0.01	0.03	
German Economy							
Output	%Y	-0.01	0.00	0.00	0.00	0.00	0.02
Inflation	D	0.23	-0.11	-0.11	-0.11	-0.10	0.31
Current account	%Y	0.02	0.01	0.00	-0.00	-0.00	0.02
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.01
Exch Rate $/gdr	%	-0.35	0.07	0.13	0.18	0.23	2.20
Real Exch Rate	%	-0.28	0.12	0.10	0.07	0.06	0.36
Real Trade Bal	%Y	-0.04	-0.02	-0.01	-0.01	-0.01	
Money	%	-0.13	0.11	0.04	-0.03	-0.12	
Int Rate (sh)	D	0.41	0.02	-0.04	-0.09	-0.11	
ROECD Economies							
Output	%Y	0.06	-0.01	0.04	0.05	0.05	0.13
Inflation	D	0.26	-0.18	-0.08	-0.04	-0.01	0.33
Current account	%Y	0.06	-0.01	0.00	0.01	0.01	0.06
Budget deficit	%Y	-0.02	0.00	-0.01	-0.02	-0.02	0.04
Exch Rate $/roe	%	-0.31	0.13	0.08	0.03	-0.01	0.56
Real Exch Rate	%	-0.20	0.15	0.03	-0.03	-0.05	0.27
Real Trade Bal	%Y	0.03	-0.03	-0.01	0.00	0.01	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.38	0.14	0.05	0.01	-0.02	

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Table : World Model msgg23/86 29 / 9 /1989
Optimal Non-Cooperative Rule (Discretion)
German Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Current account	%Y	-0.00	-0.00	-0.00	0.00	0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.01	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	0.01	0.00	-0.00	-0.00	-0.00	
Japanese Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	-0.00	-0.00	0.01
Current account	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/yen	%	-0.02	0.00	0.00	-0.00	-0.00	0.02
Real Exch Rate	%	-0.01	0.00	0.00	0.00	0.00	0.01
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	-0.00	0.00	0.00	-0.00	-0.00	
German Economy							
Output	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	-0.02	0.01	0.01	0.01	0.01	0.03
Current account	%Y	-0.01	0.00	0.00	0.00	0.00	0.01
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/gdr	%	0.14	-0.01	-0.01	-0.02	-0.02	0.27
Real Exch Rate	%	0.13	-0.02	-0.01	-0.01	-0.00	0.13
Real Trade Bal	%Y	-0.04	0.00	0.00	0.00	0.00	
Money	%	4.90	-0.01	-0.00	0.01	0.01	
Int Rate (sh)	D	0.16	-0.00	0.00	0.01	0.01	
ROECD Economies							
Output	%Y	0.01	-0.00	0.00	0.00	0.00	0.01
Inflation	D	0.02	-0.01	-0.00	-0.00	0.00	0.02
Current account	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Budget deficit	%Y	-0.00	0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/roe	%	0.02	0.00	0.00	-0.00	-0.00	0.02
Real Exch Rate	%	0.02	0.00	-0.00	-0.00	-0.00	0.02
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.03	0.00	-0.00	-0.00	-0.00	

Table : World Model msgg23/86 29 / 9 /1989
Optimal Non-Cooperative Rule (Discretion)
German Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.08	0.03	0.02	0.02	0.02	0.10
Inflation	D	0.10	-0.04	-0.04	-0.03	-0.03	0.12
Current account	%Y	-0.01	-0.01	-0.00	0.00	0.00	0.03
Budget deficit	%Y	0.02	-0.01	-0.01	-0.01	-0.01	0.03
Trade Bal	%Y	0.02	-0.01	-0.00	-0.00	-0.00	
Money	%	-0.29	0.05	0.05	0.03	0.00	
Int Rate (sh)	D	0.45	0.03	-0.03	-0.05	-0.05	
Japanese Economy							
Output	%Y	-0.03	0.01	0.01	0.00	0.00	0.03
Inflation	D	0.14	-0.08	-0.04	-0.02	-0.01	0.17
Current account	%Y	-0.00	-0.01	-0.01	-0.00	-0.00	0.01
Budget deficit	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Exch Rate $/yen	%	-0.51	0.06	0.04	-0.00	-0.03	0.72
Real Exch Rate	%	-0.48	0.09	0.06	0.03	0.01	0.49
Real Trade Bal	%Y	0.02	-0.02	-0.01	-0.00	-0.00	
Money	%	0.15	0.05	0.03	0.03	0.02	
Int Rate (sh)	D	-0.12	0.05	0.00	-0.02	-0.02	
German Economy							
Output	%Y	0.02	-0.01	-0.01	-0.01	-0.01	0.05
Inflation	D	-0.60	0.31	0.31	0.30	0.29	0.85
Current account	%Y	-0.29	0.03	0.02	0.01	0.01	0.30
Budget deficit	%Y	-0.01	0.00	0.00	0.00	0.00	0.02
Exch Rate $/gdr	%	4.57	-0.35	-0.31	-0.51	-0.77	9.08
Real Exch Rate	%	4.25	-0.67	-0.31	-0.18	-0.12	4.32
Real Trade Bal	%Y	-1.24	0.12	0.06	0.04	0.03	
Money	%	-3.45	-0.28	-0.09	0.17	0.45	
Int Rate (sh)	D	5.37	-0.01	0.16	0.21	0.23	
ROECD Economies							
Output	%Y	0.35	-0.10	0.08	0.12	0.11	0.43
Inflation	D	0.53	-0.46	-0.13	-0.03	0.01	0.72
Current account	%Y	0.20	-0.08	-0.04	-0.03	-0.02	0.23
Budget deficit	%Y	-0.11	0.03	-0.03	-0.04	-0.03	0.13
Exch Rate $/roe	%	0.53	0.02	0.00	-0.02	-0.03	0.59
Real Exch Rate	%	0.69	0.11	-0.10	-0.13	-0.12	0.74
Real Trade Bal	%Y	0.12	-0.11	-0.05	-0.03	-0.02	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.96	0.05	-0.01	-0.03	-0.03	

Table 3.2 : World Model msgg23/86 29 / 9 /1989
Optimal Cooperative Rule (Discretion)
Oil Price Shock (100%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-2.31	0.51	0.51	0.48	0.43	2.62
Inflation	D	3.19	-0.85	-0.85	-0.80	-0.73	3.58
Current account	%Y	-0.37	0.05	0.00	-0.01	-0.01	0.37
Budget deficit	%Y	0.72	-0.16	-0.16	-0.15	-0.13	0.82
Trade Bal	%Y	-0.04	0.05	-0.00	-0.01	-0.01	
Money	%	-3.69	3.40	2.67	1.86	1.06	
Int Rate (sh)	D	7.64	-1.02	-1.21	-1.24	-1.17	
Japanese Economy							
Output	%Y	-0.52	-0.02	0.01	0.02	0.03	0.53
Inflation	D	3.35	-0.33	-0.52	-0.61	-0.64	3.51
Current account	%Y	0.07	-0.03	-0.05	-0.05	-0.04	0.12
Budget deficit	%Y	0.16	0.01	-0.00	-0.01	-0.01	0.17
Exch Rate $/yen	%	-3.07	0.94	-0.01	-0.39	-0.56	3.62
Real Exch Rate	%	-3.03	1.68	1.09	0.90	0.82	4.19
Real Trade Bal	%Y	-0.11	-0.14	-0.09	-0.06	-0.05	
Money	%	0.54	3.04	3.03	2.60	1.98	
Int Rate (sh)	D	3.62	-0.07	-0.83	-1.06	-1.09	
German Economy							
Output	%Y	-0.00	0.00	0.01	0.01	0.02	0.07
Inflation	D	2.52	-0.80	-1.07	-1.18	-1.23	3.33
Current account	%Y	0.55	0.10	-0.05	-0.10	-0.11	0.61
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.02
Exch Rate $/gdr	%	0.67	2.50	1.49	1.57	2.05	21.39
Real Exch Rate	%	-0.16	1.90	0.75	0.48	0.47	2.68
Real Trade Bal	%Y	-0.47	-0.17	-0.10	-0.08	-0.08	
Money	%	-1.12	1.69	1.49	0.61	-0.56	
Int Rate (sh)	D	5.81	-0.01	-1.29	-1.72	-1.81	
ROECD Economies							
Output	%Y	-1.20	-0.46	0.32	0.66	0.75	2.08
Inflation	D	3.48	-2.52	-1.21	-0.50	-0.13	4.49
Current account	%Y	0.26	-0.10	0.03	0.09	0.11	0.42
Budget deficit	%Y	0.37	0.14	-0.10	-0.21	-0.23	0.65
Exch Rate $/roe	%	0.61	4.09	1.90	0.68	-0.13	9.79
Real Exch Rate	%	1.10	2.98	0.15	-0.89	-1.13	3.83
Real Trade Bal	%Y	-0.15	-0.32	-0.03	0.10	0.14	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	4.15	1.17	0.01	-0.43	-0.55	

Table 3.6:

World Model msgg23/86 29 / 9 /1989

Optimal Cooperative Rule (Discretion)

U.S. Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Inflation	D	-0.01	0.00	0.00	0.00	0.00	0.01
Current account	%Y	-0.02	-0.00	-0.00	-0.00	-0.00	0.02
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Trade Bal	%Y	-0.01	0.00	0.00	0.00	0.00	
Money	%	4.87	-0.01	-0.00	0.00	0.01	
Int Rate (sh)	D	0.22	0.00	0.00	0.00	0.00	
Japanese Economy							
Output	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	0.00	0.00	0.00	0.00	0.00	0.01
Current account	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Budget deficit	%Y	0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/yen	%	-0.11	0.01	-0.00	-0.01	-0.01	0.11
Real Exch Rate	%	-0.10	0.02	0.01	0.00	0.00	0.10
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.06	-0.00	0.01	0.01	0.02	
Int Rate (sh)	D	0.11	0.02	0.00	0.00	0.00	
German Economy							
Output	%Y	0.00	0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	-0.00	0.00	0.00	0.00	0.00	0.01
Current account	%Y	0.02	0.00	0.00	0.00	0.00	0.02
Budget deficit	%Y	-0.00	-0.00	0.00	0.00	0.00	0.00
Exch Rate $/gdr	%	-0.04	0.01	0.00	-0.00	0.00	0.05
Real Exch Rate	%	-0.04	0.01	0.00	-0.00	0.00	0.04
Real Trade Bal	%Y	-0.01	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.10	-0.01	0.00	0.01	0.01	
Int Rate (sh)	D	0.16	0.02	0.00	-0.00	-0.00	
ROECD Economies							
Output	%Y	0.03	-0.00	0.00	0.00	0.00	0.03
Inflation	D	0.03	-0.02	-0.01	-0.00	-0.00	0.04
Current account	%Y	0.02	-0.00	-0.00	-0.00	-0.00	0.02
Budget deficit	%Y	-0.01	0.00	-0.00	-0.00	-0.00	0.01
Exch Rate $/roe	%	-0.13	0.02	0.01	0.01	0.01	0.15
Real Exch Rate	%	-0.11	0.03	0.01	-0.00	-0.00	0.11
Real Trade Bal	%Y	0.01	-0.01	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.07	0.01	0.00	-0.00	-0.00	

Table 5c: World Model msgg23/86 29 / 9 /1989
Optimal Cooperative Rule (Discretion)
U.S. Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.19	-0.10	-0.07	-0.06	-0.05	0.27
Inflation	D	-0.22	0.16	0.12	0.10	0.09	0.33
Current account	%Y	-0.63	-0.00	-0.02	-0.02	-0.02	0.63
Budget deficit	%Y	-0.06	0.03	0.02	0.02	0.02	0.08
Trade Bal	%Y	-0.34	0.03	0.01	0.01	0.01	
Money	%	-4.33	-0.22	-0.03	0.11	0.21	
Int Rate (sh)	D	7.31	0.16	0.06	0.02	0.02	
Japanese Economy							
Output	%Y	-0.02	-0.01	-0.01	-0.01	-0.01	0.03
Inflation	D	0.13	0.14	0.13	0.11	0.09	0.27
Current account	%Y	0.20	-0.01	-0.02	-0.01	-0.01	0.20
Budget deficit	%Y	0.01	0.00	0.00	0.00	0.00	0.01
Exch Rate $/yen	%	-3.53	0.23	-0.14	-0.24	-0.26	3.62
Real Exch Rate	%	-3.32	0.52	0.18	0.09	0.07	3.38
Real Trade Bal	%Y	0.08	-0.06	-0.04	-0.02	-0.02	
Money	%	-2.08	-0.06	0.30	0.48	0.59	
Int Rate (sh)	D	3.56	0.53	0.16	0.04	0.01	
German Economy							
Output	%Y	0.00	0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	-0.14	0.11	0.11	0.08	0.07	0.23
Current account	%Y	0.51	0.08	0.02	0.00	0.00	0.51
Budget deficit	%Y	-0.00	-0.00	0.00	0.00	0.00	0.00
Exch Rate $/gdr	%	-1.43	0.42	0.06	-0.00	0.04	1.76
Real Exch Rate	%	-1.33	0.42	0.06	-0.00	0.02	1.46
Real Trade Bal	%Y	-0.27	-0.03	-0.02	-0.01	-0.01	
Money	%	-3.31	-0.34	0.02	0.19	0.28	
Int Rate (sh)	D	5.46	0.53	0.11	-0.02	-0.05	
ROECD Economies							
Output	%Y	0.84	-0.11	0.05	0.13	0.16	0.92
Inflation	D	0.96	-0.62	-0.31	-0.14	-0.04	1.20
Current account	%Y	0.54	-0.10	-0.06	-0.03	-0.02	0.56
Budget deficit	%Y	-0.26	0.04	-0.01	-0.04	-0.05	0.29
Exch Rate $/roe	%	-4.28	0.64	0.32	0.27	0.32	5.02
Real Exch Rate	%	-3.56	1.08	0.26	-0.06	-0.15	3.74
Real Trade Bal	%Y	0.45	-0.20	-0.10	-0.05	-0.03	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	2.39	0.48	0.11	-0.03	-0.07	

Table : World Model msgg23/86 29 / 9 /1989
Optimal Cooperative Rule (Discretion)
Japanese Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Current account	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.02	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	0.03	0.00	0.00	-0.00	-0.00	
Japanese Economy							
Output	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Inflation	D	-0.02	0.02	0.01	0.01	0.01	0.03
Current account	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/yen	%	0.24	-0.03	-0.02	-0.02	-0.02	0.27
Real Exch Rate	%	0.22	-0.03	-0.01	-0.01	-0.00	0.23
Real Trade Bal	%Y	-0.03	0.00	0.00	0.00	0.00	
Money	%	4.82	0.00	0.01	0.02	0.02	
Int Rate (sh)	D	0.30	-0.01	-0.00	0.00	0.00	
German Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Current account	%Y	0.00	0.00	0.00	-0.00	-0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/gdr	%	-0.01	0.00	0.01	0.01	0.01	0.07
Real Exch Rate	%	-0.01	0.00	0.00	0.00	0.00	0.01
Real Trade Bal	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.01	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.01	0.00	-0.00	-0.00	-0.00	
ROECD Economies							
Output	%Y	0.00	-0.00	0.00	0.00	0.00	0.00
Inflation	D	0.01	-0.01	-0.00	-0.00	-0.00	0.01
Current account	%Y	0.00	-0.00	0.00	0.00	0.00	0.00
Budget deficit	%Y	-0.00	0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/roe	%	-0.01	0.01	0.00	0.00	0.00	0.01
Real Exch Rate	%	-0.01	0.01	0.00	-0.00	-0.00	0.01
Real Trade Bal	%Y	0.00	-0.00	-0.00	0.00	0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.01	0.00	0.00	0.00	-0.00	

Table 32: World Model msgg23/86 29 / 9 /1989
Optimal Cooperative Rule (Discretion)
Japanese Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.12	0.04	0.03	0.03	0.03	0.15
Inflation	D	0.13	-0.02	-0.02	-0.03	-0.03	0.14
Current account	%Y	-0.01	-0.01	-0.01	-0.00	-0.00	0.02
Budget deficit	%Y	0.04	-0.01	-0.01	-0.01	-0.01	0.05
Trade Bal	%Y	0.03	-0.01	-0.00	-0.00	-0.00	
Money	%	-0.62	0.08	0.10	0.10	0.08	
Int Rate (sh)	D	0.91	0.07	0.00	-0.03	-0.04	
Japanese Economy							
Output	%Y	0.17	-0.08	-0.05	-0.03	-0.02	0.20
Inflation	D	-0.63	0.59	0.36	0.25	0.18	0.99
Current account	%Y	-0.14	0.05	0.02	0.01	0.00	0.15
Budget deficit	%Y	-0.05	0.03	0.02	0.01	0.01	0.06
Exch Rate $/yen	%	7.94	-1.00	-0.73	-0.72	-0.80	9.12
Real Exch Rate	%	7.49	-1.11	-0.48	-0.20	-0.07	7.59
Real Trade Bal	%Y	-1.07	0.14	0.06	0.03	0.01	
Money	%	-6.13	0.01	0.29	0.52	0.70	
Int Rate (sh)	D	9.84	-0.20	-0.01	0.05	0.06	
German Economy							
Output	%Y	-0.02	0.01	0.00	0.00	0.00	0.02
Inflation	D	0.22	-0.10	-0.10	-0.10	-0.10	0.30
Current account	%Y	0.02	0.01	0.00	-0.00	-0.01	0.03
Budget deficit	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Exch Rate $/gdr	%	-0.31	0.10	0.17	0.22	0.28	2.43
Real Exch Rate	%	-0.25	0.14	0.11	0.08	0.06	0.35
Real Trade Bal	%Y	-0.05	-0.02	-0.01	-0.01	-0.01	
Money	%	-0.20	0.12	0.05	-0.03	-0.11	
Int Rate (sh)	D	0.49	0.00	-0.05	-0.09	-0.11	
ROECD Economies							
Output	%Y	0.07	-0.01	0.04	0.06	0.05	0.14
Inflation	D	0.27	-0.19	-0.08	-0.03	-0.01	0.34
Current account	%Y	0.06	-0.02	0.00	0.00	0.01	0.07
Budget deficit	%Y	-0.02	0.00	-0.01	-0.02	-0.02	0.04
Exch Rate $/roe	%	-0.33	0.18	0.12	0.08	0.05	0.42
Real Exch Rate	%	-0.21	0.19	0.04	-0.03	-0.05	0.30
Real Trade Bal	%Y	0.04	-0.04	-0.01	0.00	0.01	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.40	0.13	0.05	0.00	-0.02	

Table : World Model msgg23/86 29 / 9 /1989
Optimal Cooperative Rule (Discretion)
German Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Current account	%Y	-0.00	-0.00	-0.00	0.00	0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.01	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	0.01	0.00	-0.00	-0.00	-0.00	
Japanese Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	-0.00	0.00	0.00
Current account	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/yen	%	-0.01	0.00	0.00	-0.00	-0.00	0.04
Real Exch Rate	%	-0.01	0.00	0.00	0.00	0.00	0.01
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	0.00	0.00	
Int Rate (sh)	D	-0.00	0.00	0.00	-0.00	-0.00	
German Economy							
Output	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	-0.02	0.01	0.01	0.01	0.01	0.03
Current account	%Y	-0.01	0.00	0.00	0.00	0.00	0.01
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/gdr	%	0.14	-0.01	-0.01	-0.02	-0.02	0.27
Real Exch Rate	%	0.13	-0.02	-0.01	-0.01	-0.00	0.13
Real Trade Bal	%Y	-0.04	0.00	0.00	0.00	0.00	
Money	%	4.90	-0.01	-0.00	0.01	0.01	
Int Rate (sh)	D	0.16	-0.00	0.00	0.01	0.01	
ROECD Economies							
Output	%Y	0.01	-0.00	0.00	0.00	0.00	0.01
Inflation	D	0.02	-0.01	-0.00	-0.00	0.00	0.02
Current account	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Budget deficit	%Y	-0.00	0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/roe	%	0.02	0.00	-0.00	-0.00	-0.00	0.02
Real Exch Rate	%	0.02	0.00	-0.00	-0.00	-0.00	0.02
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.03	0.00	-0.00	-0.00	-0.00	

Table : World Model msgg23/86 29 / 9 /1989
Optimal Cooperative Rule (Discretion)
German Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.07	0.03	0.02	0.02	0.02	0.09
Inflation	D	0.10	-0.05	-0.04	-0.03	-0.03	0.13
Current account	%Y	-0.01	-0.01	-0.00	0.00	0.00	0.03
Budget deficit	%Y	0.02	-0.01	-0.01	-0.01	-0.01	0.03
Trade Bal	%Y	0.02	-0.01	-0.00	-0.00	-0.00	
Money	%	-0.25	0.05	0.05	0.03	-0.00	
Int Rate (sh)	D	0.42	0.03	-0.03	-0.05	-0.05	
Japanese Economy							
Output	%Y	-0.03	0.01	0.01	0.00	0.00	0.04
Inflation	D	0.14	-0.09	-0.03	-0.01	0.00	0.16
Current account	%Y	-0.00	-0.01	-0.01	-0.00	-0.00	0.01
Budget deficit	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Exch Rate $/yen	%	-0.45	0.07	0.04	-0.01	-0.06	1.22
Real Exch Rate	%	-0.43	0.08	0.05	0.02	0.01	0.44
Real Trade Bal	%Y	0.02	-0.02	-0.01	-0.00	-0.00	
Money	%	0.13	0.03	0.02	0.01	0.02	
Int Rate (sh)	D	-0.11	0.06	0.02	-0.00	-0.00	
German Economy							
Output	%Y	0.03	-0.01	-0.01	-0.01	-0.01	0.04
Inflation	D	-0.59	0.31	0.31	0.30	0.29	0.84
Current account	%Y	-0.29	0.03	0.02	0.01	0.01	0.30
Budget deficit	%Y	-0.01	0.00	0.00	0.00	0.00	0.01
Exch Rate $/gdr	%	4.55	-0.37	-0.33	-0.53	-0.79	9.14
Real Exch Rate	%	4.23	-0.68	-0.32	-0.19	-0.13	4.30
Real Trade Bal	%Y	-1.24	0.12	0.06	0.04	0.03	
Money	%	-3.41	-0.27	-0.08	0.19	0.47	
Int Rate (sh)	D	5.33	-0.01	0.17	0.21	0.23	
ROECD Economies							
Output	%Y	0.35	-0.10	0.08	0.12	0.11	0.43
Inflation	D	0.53	-0.46	-0.13	-0.03	0.00	0.71
Current account	%Y	0.20	-0.08	-0.04	-0.03	-0.02	0.23
Budget deficit	%Y	-0.11	0.03	-0.03	-0.04	-0.03	0.13
Exch Rate $/roe	%	0.55	0.02	-0.00	-0.02	-0.04	0.62
Real Exch Rate	%	0.70	0.10	-0.10	-0.14	-0.12	0.75
Real Trade Bal	%Y	0.12	-0.11	-0.05	-0.03	-0.02	
Money	%	0.00	0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.95	0.05	-0.01	-0.03	-0.03	

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Table : World Model msgg23/86 10 / 10 /1989
INT with feedback on observed shocks
Oil Price Shock (100%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-2.92	-0.71	0.48	1.00	1.12	3.81
Inflation	D	2.94	-2.18	-1.16	-0.52	-0.14	3.88
Current account	%Y	-0.40	-0.18	-0.07	-0.01	0.02	0.45
Budget deficit	%Y	0.91	0.22	-0.15	-0.31	-0.35	1.19
Trade Bal	%Y	-0.08	-0.01	0.01	0.01	0.01	
Money	%	-3.75	-1.67	-0.37	0.33	0.63	
Int Rate (sh)	D	6.26	2.78	0.62	-0.55	-1.05	
Japanese Economy							
Output	%Y	-2.14	-0.13	-0.05	-0.00	0.03	2.16
Inflation	D	2.16	-1.98	-0.17	-0.09	-0.04	2.93
Current account	%Y	0.09	-0.01	-0.07	-0.09	-0.09	0.22
Budget deficit	%Y	0.68	0.04	0.02	0.00	-0.01	0.68
Exch Rate $/yen	%	1.05	0.00	1.06	1.27	1.18	2.78
Real Exch Rate	%	0.28	-0.57	1.59	2.27	2.28	4.82
Real Trade Bal	%Y	-0.56	-0.14	-0.19	-0.18	-0.14	
Money	%	-4.38	-1.04	-0.25	0.28	0.52	
Int Rate (sh)	D	7.31	1.73	0.41	-0.46	-0.87	
German Economy							
Output	%Y	-1.47	-0.50	0.06	0.34	0.50	2.86
Inflation	D	1.50	-1.07	-0.55	-0.28	-0.16	1.95
Current account	%Y	0.53	0.37	0.16	0.02	-0.04	0.67
Budget deficit	%Y	0.46	0.16	-0.02	-0.11	-0.16	0.90
Exch Rate $/gdr	%	3.05	1.82	0.67	0.08	-0.20	3.85
Real Exch Rate	%	1.60	1.61	1.09	0.74	0.43	3.68
Real Trade Bal	%Y	-0.84	-0.42	-0.18	-0.06	0.01	
Money	%	-4.49	-2.36	-0.73	0.16	0.55	
Int Rate (sh)	D	7.49	3.93	1.21	-0.27	-0.92	
ROECD Economies							
Output	%Y	-0.98	-0.31	0.27	0.67	0.88	2.39
Inflation	D	4.15	-2.29	-1.66	-1.00	-0.48	5.14
Current account	%Y	0.50	0.11	-0.07	-0.12	-0.10	0.55
Budget deficit	%Y	0.31	0.10	-0.08	-0.21	-0.28	0.74
Exch Rate $/roe	%	-1.07	0.20	0.42	0.34	0.18	1.45
Real Exch Rate	%	-0.02	1.33	1.05	0.43	-0.12	2.67
Real Trade Bal	%Y	0.06	-0.20	-0.22	-0.16	-0.08	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	4.99	2.56	0.70	-0.39	-0.90	

Table : World Model msgg23/86 10 / 10 /1989
INT with feedback on observed shocks
U.S. Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.01
Inflation	D	-0.01	0.01	0.00	0.00	-0.00	0.01
Current account	%Y	-0.02	0.00	-0.00	-0.00	-0.00	0.02
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Trade Bal	%Y	-0.01	0.00	0.00	0.00	0.00	
Money	%	4.86	0.00	0.00	0.00	-0.00	
Int Rate (sh)	D	0.23	-0.01	-0.00	-0.00	0.00	
Japanese Economy							
Output	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	0.00	-0.00	0.00	-0.00	-0.00	0.00
Current account	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Budget deficit	%Y	0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/yen	%	-0.11	0.02	0.01	0.00	0.00	0.11
Real Exch Rate	%	-0.10	0.02	0.00	-0.00	-0.00	0.10
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.06	-0.01	-0.00	0.00	0.00	
Int Rate (sh)	D	0.10	0.01	0.00	-0.00	-0.00	
German Economy							
Output	%Y	0.00	0.00	-0.00	-0.00	-0.00	0.01
Inflation	D	-0.00	0.00	0.00	0.00	-0.00	0.01
Current account	%Y	0.02	0.00	0.00	-0.00	0.00	0.02
Budget deficit	%Y	-0.00	-0.00	0.00	0.00	0.00	0.00
Exch Rate $/gdr	%	-0.04	0.01	0.00	0.00	0.00	0.05
Real Exch Rate	%	-0.04	0.01	0.00	-0.00	0.00	0.05
Real Trade Bal	%Y	-0.01	-0.00	-0.00	-0.00	-0.00	
Money	%	-0.10	-0.00	0.00	0.00	0.00	
Int Rate (sh)	D	0.17	0.00	-0.00	-0.00	-0.00	
ROECD Economies							
Output	%Y	0.03	-0.00	0.00	0.00	0.00	0.03
Inflation	D	0.03	-0.02	-0.01	-0.00	-0.00	0.04
Current account	%Y	0.02	-0.00	-0.00	-0.00	0.00	0.02
Budget deficit	%Y	-0.01	0.00	-0.00	-0.00	-0.00	0.01
Exch Rate $/roe	%	-0.13	0.03	0.01	0.00	0.00	0.13
Real Exch Rate	%	-0.11	0.04	0.00	-0.01	-0.01	0.11
Real Trade Bal	%Y	0.01	-0.01	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.07	0.01	0.00	0.00	-0.00	

Table : World Model msgg23/86 10 / 10 /1989
INT with feedback on observed shocks
U.S. Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.15	-0.03	-0.11	-0.14	-0.13	0.33
Inflation	D	-0.24	0.24	0.10	0.03	-0.00	0.35
Current account	%Y	-0.64	0.02	-0.02	-0.03	-0.03	0.64
Budget deficit	%Y	-0.05	0.01	0.04	0.04	0.04	0.10
Trade Bal	%Y	-0.34	0.04	0.01	0.00	0.00	
Money	%	-4.55	0.12	0.05	0.01	-0.01	
Int Rate (sh)	D	7.58	-0.20	-0.09	-0.02	0.01	
Japanese Economy							
Output	%Y	-0.05	-0.01	-0.01	-0.01	-0.01	0.06
Inflation	D	0.11	-0.10	0.01	-0.00	-0.00	0.15
Current account	%Y	0.20	-0.01	-0.02	-0.01	-0.01	0.20
Budget deficit	%Y	0.02	0.00	0.00	0.00	0.00	0.02
Exch Rate $/yen	%	-3.52	0.74	0.20	0.06	0.05	3.62
Real Exch Rate	%	-3.31	0.72	0.09	-0.06	-0.07	3.40
Real Trade Bal	%Y	0.08	-0.07	-0.03	-0.02	-0.01	
Money	%	-1.99	-0.21	-0.03	0.00	0.00	
Int Rate (sh)	D	3.32	0.34	0.05	-0.01	-0.00	
German Economy							
Output	%Y	0.02	0.00	-0.06	-0.07	-0.06	0.19
Inflation	D	-0.12	0.13	0.04	0.00	-0.01	0.19
Current account	%Y	0.52	0.06	0.01	-0.00	0.00	0.53
Budget deficit	%Y	-0.01	-0.00	0.02	0.02	0.02	0.06
Exch Rate $/gdr	%	-1.49	0.45	0.11	0.06	0.09	1.69
Real Exch Rate	%	-1.36	0.42	0.05	-0.01	0.02	1.56
Real Trade Bal	%Y	-0.28	-0.00	-0.02	-0.02	-0.03	
Money	%	-3.38	-0.08	0.02	0.03	0.02	
Int Rate (sh)	D	5.64	0.14	-0.04	-0.05	-0.03	
ROECD Economies							
Output	%Y	0.85	-0.14	0.06	0.13	0.15	0.92
Inflation	D	0.97	-0.67	-0.27	-0.10	-0.02	1.21
Current account	%Y	0.55	-0.12	-0.04	-0.01	0.00	0.56
Budget deficit	%Y	-0.26	0.04	-0.02	-0.04	-0.05	0.29
Exch Rate $/roe	%	-4.34	0.84	0.24	0.06	0.03	4.45
Real Exch Rate	%	-3.60	1.19	0.12	-0.21	-0.26	3.82
Real Trade Bal	%Y	0.45	-0.21	-0.08	-0.03	-0.01	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	2.40	0.40	0.10	0.01	-0.01	

Table : World Model msgg23/86 10 / 10 /1989
INT with feedback on observed shocks
Japanese Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.00	-0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	-0.00	-0.00	0.01
Current account	%Y	0.00	-0.00	-0.00	-0.00	0.00	0.00
Budget deficit	%Y	0.00	0.00	-0.00	-0.00	-0.00	0.00
Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	0.00	
Money	%	-0.01	-0.00	-0.00	-0.00	0.00	
Int Rate (sh)	D	0.02	0.01	0.00	0.00	-0.00	
Japanese Economy							
Output	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Inflation	D	-0.02	0.02	-0.00	-0.00	-0.00	0.02
Current account	%Y	-0.00	0.00	0.00	-0.00	-0.00	0.00
Budget deficit	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Exch Rate $/yen	%	0.23	-0.04	-0.01	-0.00	0.00	0.23
Real Exch Rate	%	0.22	-0.04	-0.01	-0.00	0.00	0.22
Real Trade Bal	%Y	-0.03	0.00	0.00	0.00	-0.00	
Money	%	4.83	0.01	0.00	0.00	0.00	
Int Rate (sh)	D	0.28	-0.02	-0.01	-0.00	-0.00	
German Economy							
Output	%Y	-0.00	-0.00	0.00	0.00	0.00	0.01
Inflation	D	0.00	-0.00	-0.00	-0.00	-0.00	0.01
Current account	%Y	0.00	0.00	0.00	0.00	0.00	0.00
Budget deficit	%Y	0.00	0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/gdr	%	-0.00	0.00	0.00	0.00	-0.00	0.01
Real Exch Rate	%	-0.00	0.00	0.00	0.00	-0.00	0.01
Real Trade Bal	%Y	-0.00	-0.00	-0.00	-0.00	0.00	
Money	%	-0.01	-0.01	-0.00	-0.00	0.00	
Int Rate (sh)	D	0.01	0.01	0.00	0.00	-0.00	
ROECD Economies							
Output	%Y	0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Current account	%Y	0.00	0.00	-0.00	-0.00	-0.00	0.00
Budget deficit	%Y	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/roe	%	-0.01	-0.00	0.00	0.00	0.00	0.01
Real Exch Rate	%	-0.00	0.00	0.00	0.00	-0.00	0.01
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.01	0.01	0.00	0.00	-0.00	

Table : World Model msgg23/86 10 / 10 /1989
INT with feedback on observed shocks
Japanese Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.08	-0.03	0.02	0.05	0.06	0.16
Inflation	D	0.16	-0.09	-0.07	-0.04	-0.02	0.20
Current account	%Y	0.00	-0.02	-0.01	-0.00	0.00	0.03
Budget deficit	%Y	0.02	0.01	-0.01	-0.02	-0.02	0.05
Trade Bal	%Y	0.03	-0.01	-0.00	-0.00	0.00	
Money	%	-0.35	-0.14	-0.06	-0.00	0.02	
Int Rate (sh)	D	0.58	0.23	0.10	0.01	-0.04	
Japanese Economy							
Output	%Y	0.30	-0.08	-0.04	-0.02	-0.01	0.32
Inflation	D	-0.53	0.60	-0.04	-0.02	-0.01	0.80
Current account	%Y	-0.14	0.04	0.01	-0.00	-0.01	0.15
Budget deficit	%Y	-0.10	0.02	0.01	0.01	0.00	0.10
Exch Rate $/yen	%	7.57	-1.28	-0.41	-0.10	0.01	7.69
Real Exch Rate	%	7.19	-1.23	-0.36	-0.03	0.09	7.31
Real Trade Bal	%Y	-1.03	0.13	0.04	0.01	-0.00	
Money	%	-5.66	0.38	0.13	0.06	0.04	
Int Rate (sh)	D	9.43	-0.63	-0.22	-0.10	-0.07	
German Economy							
Output	%Y	-0.07	-0.03	0.03	0.05	0.06	0.25
Inflation	D	0.17	-0.14	-0.06	-0.02	-0.01	0.22
Current account	%Y	0.01	0.02	0.02	0.01	0.00	0.03
Budget deficit	%Y	0.02	0.01	-0.01	-0.01	-0.02	0.08
Exch Rate $/gdr	%	-0.11	0.15	0.06	0.01	-0.01	0.22
Real Exch Rate	%	-0.12	0.15	0.05	0.01	-0.01	0.33
Real Trade Bal	%Y	-0.04	-0.04	-0.01	-0.00	0.00	
Money	%	-0.19	-0.19	-0.09	-0.02	0.02	
Int Rate (sh)	D	0.32	0.32	0.15	0.03	-0.03	
ROECD Economies							
Output	%Y	0.06	0.01	0.03	0.04	0.05	0.15
Inflation	D	0.26	-0.14	-0.10	-0.06	-0.03	0.32
Current account	%Y	0.06	0.00	-0.00	-0.00	-0.00	0.06
Budget deficit	%Y	-0.02	-0.00	-0.01	-0.01	-0.02	0.05
Exch Rate $/roe	%	-0.22	-0.03	0.00	0.01	0.01	0.23
Real Exch Rate	%	-0.14	0.06	0.05	0.02	-0.00	0.20
Real Trade Bal	%Y	0.04	-0.02	-0.01	-0.01	-0.01	
Money	%	0.00	0.00	0.00	-0.00	-0.00	
Int Rate (sh)	D	0.38	0.20	0.09	0.01	-0.03	

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Table : World Model msgg23/86 10 / 10 /1989
INT with feedback on observed shocks
German Money Demand Shock (5%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.00	0.00	0.00	0.00	0.00	0.00
Inflation	D	0.00	-0.00	-0.00	0.00	0.00	0.00
Current account	%Y	-0.00	-0.00	0.00	0.00	0.00	0.00
Budget deficit	%Y	0.00	-0.00	-0.00	-0.00	-0.00	0.00
Trade Bal	%Y	0.00	-0.00	0.00	0.00	0.00	
Money	%	-0.00	-0.00	-0.00	0.00	0.00	
Int Rate (sh)	D	0.01	0.00	0.00	-0.00	-0.00	
Japanese Economy							
Output	%Y	-0.00	0.00	-0.00	-0.00	-0.00	0.00
Inflation	D	0.00	-0.00	0.00	0.00	0.00	0.00
Current account	%Y	-0.00	-0.00	0.00	0.00	0.00	0.00
Budget deficit	%Y	0.00	-0.00	0.00	0.00	0.00	0.00
Exch Rate $/yen	%	-0.01	0.00	0.00	0.00	-0.00	0.01
Real Exch Rate	%	-0.01	0.00	0.00	0.00	0.00	0.01
Real Trade Bal	%Y	0.00	-0.00	-0.00	0.00	0.00	
Money	%	0.00	-0.00	-0.00	0.00	0.00	
Int Rate (sh)	D	-0.00	0.00	0.00	-0.00	-0.00	
German Economy							
Output	%Y	0.00	0.00	-0.00	-0.00	-0.01	0.02
Inflation	D	-0.01	0.01	0.01	0.00	0.00	0.02
Current account	%Y	-0.01	0.00	-0.00	-0.00	-0.00	0.01
Budget deficit	%Y	-0.00	-0.00	0.00	0.00	0.00	0.01
Exch Rate $/gdr	%	0.13	-0.03	-0.00	0.00	0.00	0.13
Real Exch Rate	%	0.12	-0.03	-0.00	0.01	0.01	0.13
Real Trade Bal	%Y	-0.04	0.01	0.00	0.00	-0.00	
Money	%	4.90	0.01	0.00	0.00	0.00	
Int Rate (sh)	D	0.16	-0.02	-0.01	-0.00	-0.00	
ROECD Economies							
Output	%Y	0.01	-0.00	0.00	0.00	0.00	0.01
Inflation	D	0.01	-0.01	-0.00	0.00	0.00	0.02
Current account	%Y	0.01	-0.00	-0.00	-0.00	-0.00	0.01
Budget deficit	%Y	-0.00	0.00	-0.00	-0.00	-0.00	0.00
Exch Rate $/roe	%	0.02	-0.00	0.00	0.00	0.00	0.02
Real Exch Rate	%	0.02	0.00	-0.00	0.00	0.00	0.02
Real Trade Bal	%Y	0.00	-0.00	-0.00	-0.00	-0.00	
Money	%	0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.03	-0.00	-0.00	-0.00	-0.00	

Table 3G : World Model msgg23/86 10 / 10 /1989
INT with feedback on observed shocks
German Real Demand Shock (1%)

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	-0.07	0.00	0.02	0.02	0.01	0.10
Inflation	D	0.10	-0.09	-0.02	0.00	0.01	0.13
Current account	%Y	-0.01	-0.01	0.01	0.01	0.01	0.05
Budget deficit	%Y	0.02	-0.00	-0.01	-0.01	-0.00	0.03
Trade Bal	%Y	0.02	-0.00	0.01	0.01	0.01	
Money	%	-0.16	-0.06	-0.00	0.01	0.01	
Int Rate (sh)	D	0.27	0.10	0.00	-0.02	-0.02	
Japanese Economy							
Output	%Y	-0.07	0.02	-0.00	-0.01	-0.01	0.09
Inflation	D	0.10	-0.12	0.02	0.01	0.00	0.16
Current account	%Y	-0.01	-0.00	0.00	0.01	0.01	0.04
Budget deficit	%Y	0.02	-0.00	0.00	0.00	0.00	0.03
Exch Rate $/yen	%	-0.37	0.07	0.04	0.01	-0.00	0.38
Real Exch Rate	%	-0.36	0.05	0.06	0.04	0.02	0.39
Real Trade Bal	%Y	0.01	-0.01	-0.00	0.00	0.01	
Money	%	0.10	-0.08	-0.02	0.00	0.00	
Int Rate (sh)	D	-0.16	0.13	0.03	-0.01	-0.01	
German Economy							
Output	%Y	0.16	0.09	-0.09	-0.16	-0.18	0.78
Inflation	D	-0.48	0.40	0.17	0.06	0.02	0.65
Current account	%Y	-0.30	0.00	-0.01	-0.01	-0.01	0.30
Budget deficit	%Y	-0.05	-0.03	0.03	0.05	0.06	0.25
Exch Rate $/gdr	%	4.17	-0.88	-0.15	0.07	0.14	4.30
Real Exch Rate	%	3.94	-0.97	-0.04	0.25	0.33	4.26
Real Trade Bal	%Y	-1.21	0.17	0.04	0.00	-0.01	
Money	%	-3.19	0.37	0.13	0.05	0.02	
Int Rate (sh)	D	5.32	-0.62	-0.22	-0.09	-0.04	
ROECD Economies							
Output	%Y	0.32	-0.11	0.09	0.10	0.08	0.38
Inflation	D	0.48	-0.47	-0.08	0.01	0.03	0.68
Current account	%Y	0.18	-0.09	-0.03	-0.01	-0.00	0.21
Budget deficit	%Y	-0.10	0.03	-0.03	-0.03	-0.03	0.12
Exch Rate $/roe	%	0.53	-0.07	0.07	0.11	0.13	0.70
Real Exch Rate	%	0.67	0.02	-0.02	0.01	0.04	0.78
Real Trade Bal	%Y	0.11	-0.11	-0.03	-0.01	-0.00	
Money	%	0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	0.87	-0.03	-0.04	-0.03	-0.02	

optimal policy with inflationary bias

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.75	0.63	0.57	0.52	0.47	
Inflation	D	0.39	0.56	0.65	0.73	0.80	
Current account	%Y	0.05	0.01	-0.00	-0.00	-0.00	
Budget deficit	%Y	-0.23	-0.20	-0.18	-0.16	-0.15	
Trade Bal	%Y	0.00	-0.02	-0.03	-0.03	-0.03	
Money	%	1.47	1.58	2.02	2.61	3.31	
Int Rate (sh)	D	-0.53	-0.06	0.18	0.32	0.43	
Japanese Economy							
Output	%Y	0.93	0.03	0.01	0.01	0.01	
Inflation	D	0.65	5.50	5.64	5.64	5.60	
Current account	%Y	0.03	0.10	0.13	0.13	0.13	
Budget deficit	%Y	-0.29	-0.01	-0.00	-0.00	-0.00	
Exch Rate $/yen	%	-1.56	-5.62	-11.39	-16.47	-21.20	
Real Exch Rate	%	-1.36	-0.33	-1.10	-1.28	-1.22	
Real Trade Bal	%Y	0.23	0.11	0.19	0.20	0.19	
Money	%	-0.58	2.80	8.69	14.45	20.11	
Int Rate (sh)	D	3.52	5.71	5.26	5.06	4.97	
German Economy							
Output	%Y	0.99	0.99	0.99	0.99	0.99	
Inflation	D	0.69	0.80	0.73	0.68	0.64	
Current account	%Y	0.02	-0.01	-0.01	-0.00	-0.00	
Budget deficit	%Y	-0.31	-0.31	-0.31	-0.31	-0.31	
Exch Rate $/gdr	%	-1.03	-1.56	-1.61	-1.52	-1.34	
Real Exch Rate	%	-0.84	-1.10	-1.06	-1.03	-1.02	
Real Trade Bal	%Y	0.20	0.17	0.15	0.14	0.13	
Money	%	1.60	2.36	3.04	3.69	4.31	
Int Rate (sh)	D	-0.01	-0.00	0.09	0.14	0.17	
ROECD Economies							
Output	%Y	-0.12	0.06	0.13	0.14	0.14	
Inflation	D	-0.45	-0.10	-0.01	0.02	0.03	
Current account	%Y	-0.23	-0.18	-0.16	-0.15	-0.14	
Budget deficit	%Y	0.04	-0.02	-0.04	-0.05	-0.04	
Exch Rate $/roe	%	1.72	1.69	2.17	2.83	3.59	
Real Exch Rate	%	1.14	0.39	0.19	0.14	0.11	
Real Trade Bal	%Y	-0.22	-0.14	-0.11	-0.09	-0.08	
Money	%	-0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	-0.49	-0.54	-0.48	-0.44	-0.40	

cooperative policy with inflationary bias

		1	2	3	4	5	s.e.
U.S. Economy							
Output	%Y	0.87	0.92	0.83	0.75	0.68	
Inflation	D	0.46	0.91	1.06	1.18	1.28	
Current account	%Y	0.04	0.03	0.01	0.00	0.00	
Budget deficit	%Y	-0.27	-0.29	-0.26	-0.23	-0.21	
Trade Bal	%Y	0.01	-0.02	-0.03	-0.03	-0.03	
Money	%	1.37	2.18	2.92	3.89	5.02	
Int Rate (sh)	D	-0.04	0.06	0.41	0.63	0.78	
Japanese Economy							
Output	%Y	1.49	0.02	-0.02	-0.02	-0.01	
Inflation	D	1.15	9.19	9.40	9.37	9.26	
Current account	%Y	0.08	0.18	0.23	0.24	0.23	
Budget deficit	%Y	-0.47	-0.01	0.01	0.01	0.00	
Exch Rate $/yen	%	-3.64	-9.84	-19.48	-27.93	-35.78	
Real Exch Rate	%	-3.07	-0.75	-2.01	-2.28	-2.16	
Real Trade Bal	%Y	0.43	0.20	0.34	0.36	0.34	
Money	%	-1.16	4.59	14.46	24.05	33.44	
Int Rate (sh)	D	6.16	9.69	8.86	8.48	8.29	
German Economy							
Output	%Y	0.96	1.04	1.05	1.05	1.05	
Inflation	D	0.56	0.85	0.77	0.71	0.67	
Current account	%Y	0.05	-0.03	-0.03	-0.03	-0.02	
Budget deficit	%Y	-0.30	-0.33	-0.33	-0.33	-0.33	
Exch Rate $/gdr	%	-0.18	-0.65	-0.41	0.06	0.67	
Real Exch Rate	%	-0.14	-0.64	-0.66	-0.66	-0.68	
Real Trade Bal	%Y	0.12	0.15	0.13	0.12	0.11	
Money	%	1.22	2.44	3.16	3.83	4.47	
Int Rate (sh)	D	0.42	-0.18	-0.07	0.02	0.08	
ROECD Economies							
Output	%Y	-0.09	0.07	0.18	0.21	0.20	
Inflation	D	-0.50	-0.18	-0.03	0.03	0.04	
Current account	%Y	-0.26	-0.26	-0.23	-0.21	-0.20	
Budget deficit	%Y	0.03	-0.02	-0.06	-0.07	-0.06	
Exch Rate $/roe	%	2.30	2.76	3.51	4.56	5.77	
Real Exch Rate	%	1.61	0.99	0.62	0.50	0.44	
Real Trade Bal	%Y	-0.26	-0.21	-0.16	-0.14	-0.12	
Money	%	-0.00	-0.00	-0.00	-0.00	-0.00	
Int Rate (sh)	D	-0.51	-0.70	-0.64	-0.58	-0.52	