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The effects of fiscal policy on international imbalances: Japan and the United States

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Chapter 23. *Mathematical Models in Economics*. MOL Bacharach, MAH Dempster, and JL Enos, eds. University of Oxford (1990).

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The effects of fiscal policy on international imbalances: Japan and United States

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Abstract

Evidence from three multicountry models is used to assess the current-account effects of the US and Japanese fiscal policies. Asymmetries in the effects of US and Japanese policies are analysed in some detail, and attributed to differences in country size, in trade patterns (which have only a small effect) and in the extent to which induced changes in real exchange rates switch demand from domestic to foreign output. Fiscal policy has substantial current account effects in the models. For example, switching $50 billion of sustained government spending from the United States to Japan would, in the third year, improve the US current account by $24 billion and worsen that of Japan by $20 billion. Induced changes in nominal exchange rates are found to play a relatively small role in determining the effects of fiscal policy on the nominal current account.

1. Introduction

To what extent do the current account imbalances among the major industrial countries, the Asian NICs and the heavily indebted countries of South and North America represent the inevitable counterparts of fiscal imbalances? To what extent are these imbalances likely to respond to changes in fiscal policies in the major industrial countries? To what extent are exchange rate changes a necessary part of translating changes in fiscal policy into changes in external balances? These are the three key issues facing domestic and international

This paper was prepared while the author was Clifford Clark Visiting Economist in the Canadian Department of Finance, Ottawa, and was presented at the Third International Symposium of the Japanese Economic Planning Agency, Tokyo, March 1988. The assistance of Grant Macpherson and the advice of other members of the working group in international macroeconomics is gratefully acknowledged.

macroeconomic policy. This paper attempts to address these issues by using evidence from three major multicountry models to explain the effects that fiscal policies in Japan and the United States have on their own current account balances as well as on the current balance of the other country.

There has already been a substantial amount of quantitative research on the linkages between fiscal policies and the current account of the United States. Most of the existing multinational models were involved in a comparative exercise in 1985, in which one of the major experiments involved comparing the international effects of fiscal policies in the United States and in the rest of the OECD (ROECD).[1] The sources of the US current account deficit, including the roles of divergent fiscal policies in the United States and the rest of the OECD, treated as a single unit, were the subject of a workshop at the Brookings Institution in January 1987, based on results from a number of major multicountry models.[2]

The EPA symposium extends the earlier work in a number of respects: the research is symmetric in its consideration of the Japanese and United States current accounts, the perspective is forward-looking, and the structure of the Japanese economy is being studied in some detail, both on its own and in comparison with other countries. In addition, more attention is being paid to the effects of each country's policies on the other country's current account, and to the explanation of any asymmetries that may appear when the effects of Japanese and US policies are compared. Three multicountry models have been used to prepare evidence for the seminar: those of the Japanese Economic Planning Agency (the EPA World Model, referred to here as EPA), the US Federal Reserve Board (the MultiCountry Model, referred to here as MCM), and the OECD (the INTERLINK model, referred to here as OECD).

This paper deals principally with the current account effects of fiscal policies, based on simulation experiments run over a six year horizon extending from 1987 through 1992. The figures drawn for this paper show results over the whole six years, while the analytical tables explaining the current account effects in more detail concentrate on the first-year and third-year results of the changes in fiscal policy.

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[1] The results are presented in full in Bryant *et al.* (1988*a*), and shown briefly in §2 of this paper.

[2] The main results, which are presented in Bryant *et al.* (1988*b*), showed (e.g. Helkie and Hooper 1988, p.48) that divergent fiscal policies in the United States and the rest of the OECD could explain most of the US current account deficit that emerged during the 1980s.

Figure 1

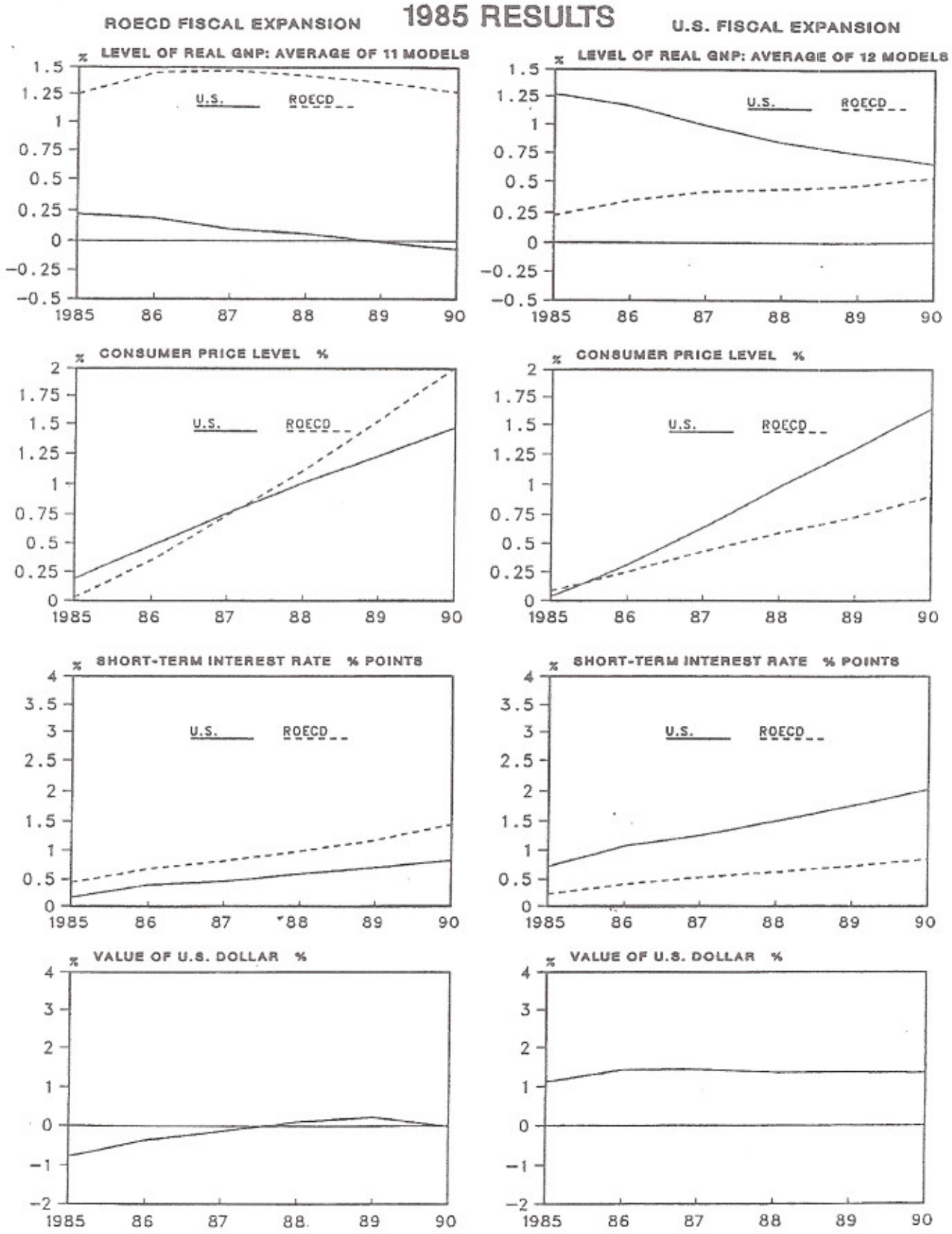
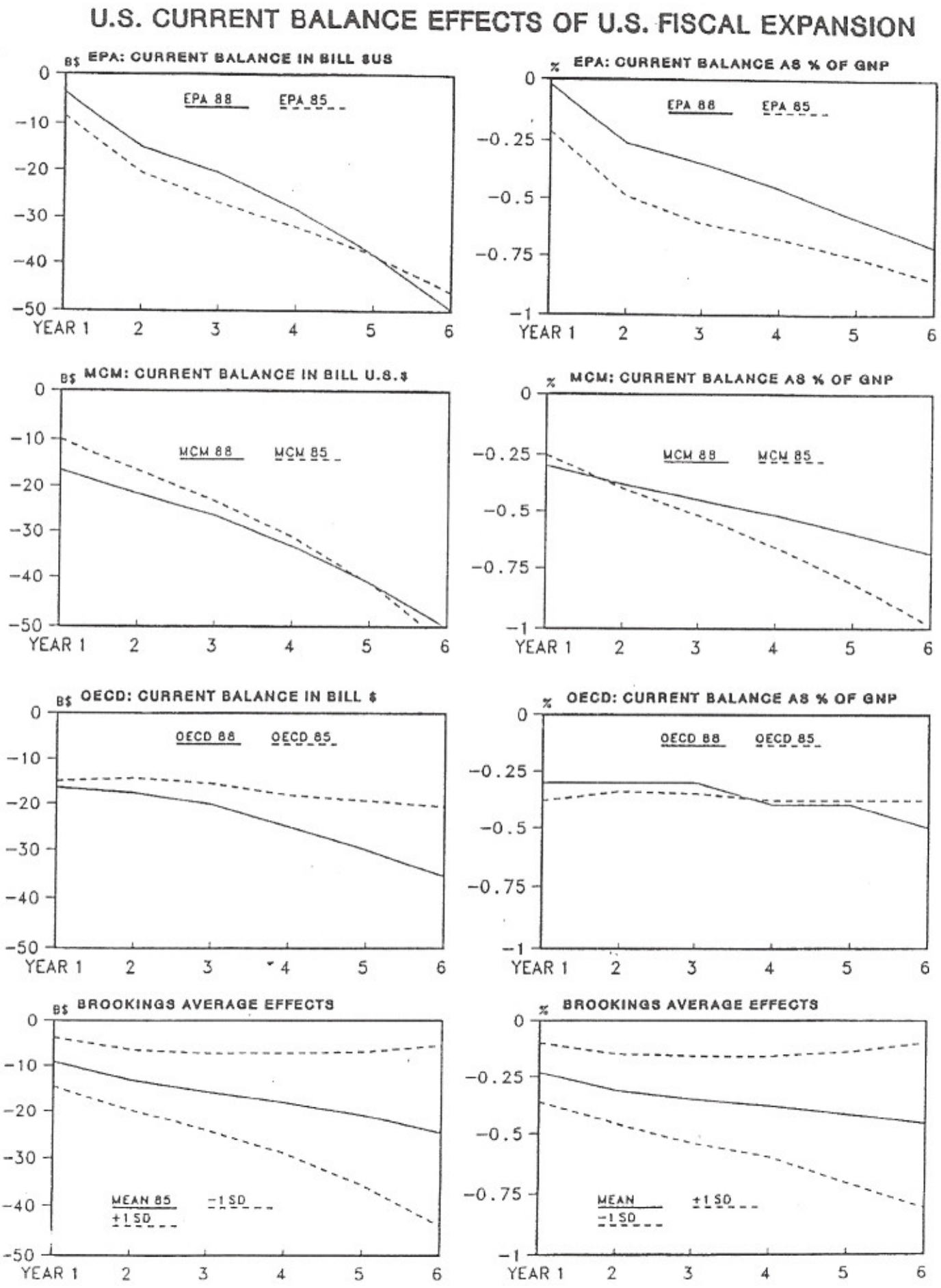

1985 RESULTS
ROECD FISCAL EXPANSION
U.S. FISCAL EXPANSION
% LEVEL OF REAL GNP: AVERAGE OF 11 MODELS
% LEVEL OF REAL GNP: AVERAGE OF 12 MODELS
% CONSUMER PRICE LEVEL %
% SHORT-TERM INTEREST RATE % POINTS
% VALUE OF U.S. DOLLAR %
U.S.
ROECD
1985
86
87
88
89
90

Figure 2


U.S. CURRENT BALANCE EFFECTS OF U.S. FISCAL EXPANSION
B$ EPA: CURRENT BALANCE IN BILL $US
EPA 88
EPA 85
% EPA: CURRENT BALANCE AS % OF GNP
B$ MCM: CURRENT BALANCE IN BILL U.S.$
MCM 88
MCM 85
% MCM: CURRENT BALANCE AS % OF GNP
B$ OECD: CURRENT BALANCE IN BILL $
OECD 88
OECD 85
% OECD: CURRENT BALANCE AS % OF GNP
B$ BROOKINGS AVERAGE EFFECTS
MEAN 85
±1 SD
% BROOKINGS AVERAGE EFFECTS
MEAN
±1 SD
YEAR 1 2 3 4 5 6

The typical fiscal policy change studied is a sustained increase in real government spending equal to 1 per cent of baseline real GNP. Money supplies are held fixed and exchange rates are flexible in the experiments that are the main focus of this paper. Comparable results under fixed exchange rates will, however, be used to show the role that exchange rate movements play in determining the link between budget deficits and external deficits.

The paper starts with an overview of some of the main features of the new evidence, including comparisons with the results prepared for the earlier Brookings conference. The analysis then turns to a more intensive examination of the reasons for some of these results. This is done in two sections, §3 dealing with the reasons for some of the asymmetries in the current-account effects of Japanese and US fiscal policies, and §4 briefly analysing the role of exchange rate movements in establishing the relationship between fiscal policies and international imbalances. The final section then summarizes the results and draws some implications for the analysis of fiscal policy.

2. Overview of the evidence

To provide a basis for comparison, Fig. 1 summarizes the average macroeconomic effects of US and ROECD fiscal expansion, as represented by the multicountry models drawn together for the 1985 Brookings experiments.[3] The bottom panels of Fig. 2 then show the average US current account effects, from the same experiments, of US fiscal expansion.[4] The top panels of Fig. 2 show the US current account effects separately for each of the three models (EPA, MCM, and OECD) involved in the EPA Symposium. By showing comparable results for the 1985 and 1988 experiments, these figures are especially useful in revealing any major changes in model structure between the two sets of experiments. The two bottom right panels of Fig. 3 compare the 1985 and 1988 results, from the same three models, for the effects of US fiscal policy on the Japanese current balance.

What are the main features of the 1985 results? In terms of the first-year international transmission of income in response to fiscal

[3] The results were put in comparable form in October 1985, in preparation for a conference held in March 1986. The average results shown in Fig. 1, and in the bottom panels of Fig. 2, are taken from Table B (p.52) and Table G (p.113) of Part Two of Bryant *et al.* (1988*a*). The signs of the results of the US fiscal policy have been changed to make it a fiscal expansion, for easier comparison with the ROECD results, and with the results prepared for the EPA Symposium, all of which refer to fiscal expansions.

[4] Comparable results for Japanese fiscal expansion are not available from the 1985 experiments.

policies, the top panels of Fig. 1 show almost complete symmetry between US and ROECD fiscal policies, with each region's fiscal expansion raising real GNP at home by 1.25 per cent, in response to a fiscal expansion equal to 1 per cent of GNP, with real GNP in the other region rising by 0.25 per cent. This apparent symmetry is actually the net result of three asymmetries, however, as the larger size of the ROECD, which would tend to make the transmission larger from the ROECD to the United States than vice versa, is offset by the net effect of two other factors. These are the higher propensity to import in the ROECD[5] and the fact that 50 per cent of US imports come from the ROECD, while only 12 per cent of ROECD imports come from the United States.

This initial equality of transmission soon disappears, however, as the domestic income effects of the US fiscal expansion are crowded out by the higher prices, exchange rates (except for OECD), and interest rates, and an increasing proportion of the induced income is in the ROECD. By contrast, the ROECD income multiplier remains much higher, with much smaller induced increases in the price level, in the value of the domestic currencies, and in interest rates. The bottom right-hand panel of Fig. 2 shows the substantial extent to which the US current account continues to weaken in response to the fiscal expansion, with the average induced current account deficit being about 0.5 per cent of GNP by the sixth year of the fiscal expansion.

The upper panels of Fig. 2 show the current account effects of US fiscal expansion on a model-by-model basis for the EPA, MCM and OECD models, with the 1985 and 1988 results compared, expressed both in terms of billion US dollars (on the left-hand side of the page) and as a percentage of GNP. Looking first at the 1985 results from the three models, the EPA and MCM results show the US current account worsening by more than the average across all twelve models, while the OECD current account effects are smaller than average and show little tendency to grow over the six years.

Comparing the 1985 and 1988 results, it can be seen that the models have changed slightly, so as to move their estimated US current account effects closer to each other, and to the average from the 1985 experiments. Thus all three models now show the US current account consequences growing with time, and to be between 0.5 per cent and 0.7 per cent of GNP by the sixth year of the fiscal expansion.

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[5] 1985 imports were 9 per cent of GNP for the United States, compared to 20 per cent for the ROECD. This factor, which would tend to make the transmission relatively smaller from the United States to the ROECD, is more than offset by the difference in trade patterns described in the text.

Figure 3

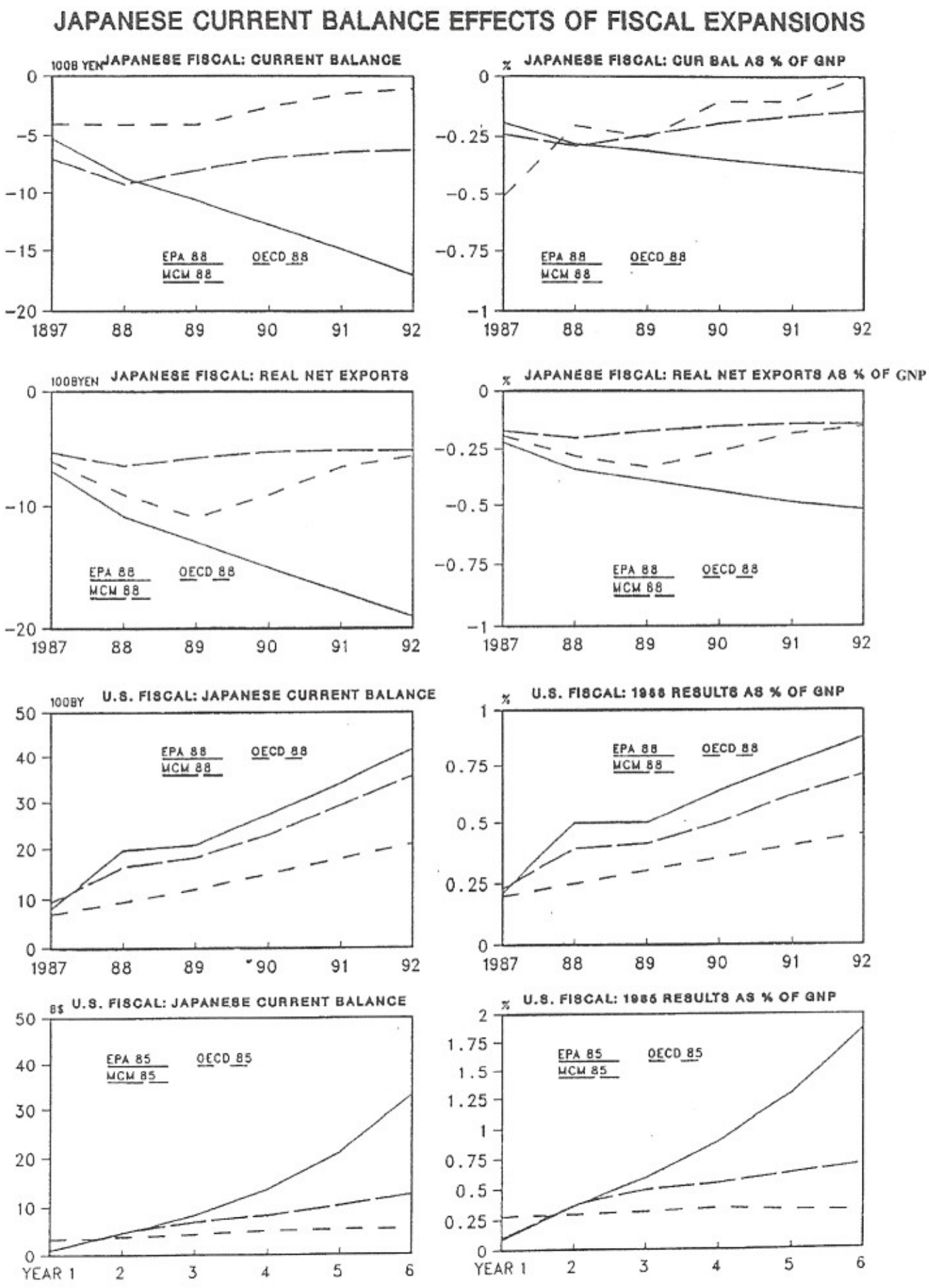
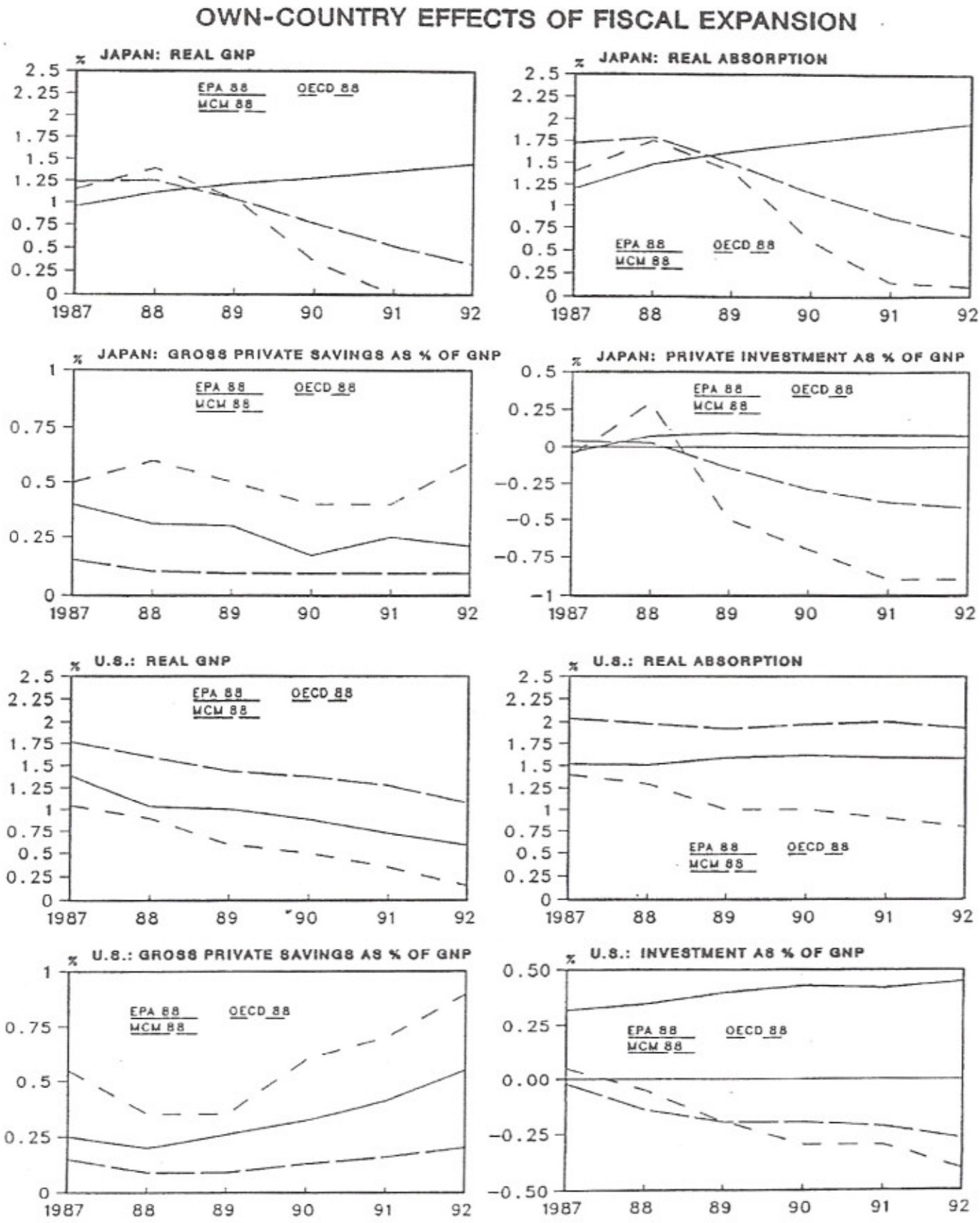

JAPANESE CURRENT BALANCE EFFECTS OF FISCAL EXPANSIONS
100B YEN JAPANESE FISCAL: CURRENT BALANCE
EPA 88
MCM 88
OECD 88
% JAPANESE FISCAL: CUR BAL AS % OF GNP
100BYEN JAPANESE FISCAL: REAL NET EXPORTS
% JAPANESE FISCAL: REAL NET EXPORTS AS % OF GNP
100BY U.S. FISCAL: JAPANESE CURRENT BALANCE
% U.S. FISCAL: 1988 RESULTS AS % OF GNP
B$ U.S. FISCAL: JAPANESE CURRENT BALANCE
EPA 85
MCM 85
OECD 85
% U.S. FISCAL: 1985 RESULTS AS % OF GNP
1897 88 89 90 91 92
1987 88 89 90 91 92
YEAR 1 2 3 4 5 6

Figure 4


OWN-COUNTRY EFFECTS OF FISCAL EXPANSION
JAPAN: REAL GNP
JAPAN: REAL ABSORPTION
JAPAN: GROSS PRIVATE SAVINGS AS % OF GNP
JAPAN: PRIVATE INVESTMENT AS % OF GNP
U.S.: REAL GNP
U.S.: REAL ABSORPTION
U.S.: GROSS PRIVATE SAVINGS AS % OF GNP
U.S.: INVESTMENT AS % OF GNP
EPA 88
OECD 88
MCM 88
%
1987
88
89
90
91
92

Turning to Fig. 3, illustrating the effects of fiscal expansion on the Japanese current balance, the bottom right-hand panels show that in 1985 the EPA model showed by far the largest Japanese effects of US fiscal policy, growing with time to reach almost 2 per cent of GNP by the sixth year. In the 1988 results, these effects have been cut in half, although they are still somewhat larger than those of the MCM, and twice as high as those of the OECD model. In all three models the effects of US fiscal expansion on the Japanese current balance are as great as on the US current balance, and somewhat higher in the case of EPA, where the effects are measured as a percentage of baseline GNP in all cases.

The top half of Fig. 3 contains the new results showing the Japanese current account effects of Japanese fiscal expansion. These are largest for EPA, but in all three models are less than one-half as large as the effects of US fiscal policy, as shown in the bottom half of the figure. All three models show the Japanese fiscal expansion to worsen the Japanese current account by about 500 billion yen in the first year, as shown by the top right-hand panel of Fig. 3. Thereafter, the EPA effects continue to grow, while the MCM effects remain fairly constant and the OECD effects gradually disappear.

As seen by comparing Figs. 2 and 3, the three models give very similar estimates of the effects of US fiscal policy on the US current account, but rather different estimates of the effects of Japanese fiscal expansion on the Japanese current account. To understand these differences better, we can exploit the fact that the current account is simply the difference between private investment and the sum of gross private saving and net saving of the public sector. Similarly, any worsening in the real current account deficit in response to fiscal stimulus can be expressed equally well as the amount by which induced absorption exceeds induced real output. To make use of these alternative ways of viewing the current account, Fig. 4 shows the own-country effects of fiscal expansions in terms of real GNP, real absorption, gross private savings and gross private investment.[6]

Looking first at the results for Japan, the real absorption and GNP increases for the EPA model, with real absorption steadily rising to a level 2 per cent above baseline by the sixth year, show that the

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[6]The matching results for the induced changes in the government balance as a share of GNP, which reveal the extent to which additional tax revenues serve to finance the increase in government spending (equal to 1 per cent of GNP), are shown in the second-row panels of Figs. 5, 7, and 9, which contain the model-by-model results for EPA, MCM and OECD, respectively. Since the government spending is financed by borrowing, the cumulating debt also increases government spending further through its impact on public debt charges.

growing EPA current account effects shown in Fig. 3 are not the result of crowding out, but of imports increasing with absorption and income as both continue to grow. For the other two models, the real GNP and domestic absorption effects are both crowded out; for the MCM some of this crowding out takes the form of increased real imports, but in neither case is there a widening gap between absorption and GNP. Thus in none of the three models is there evidence of the multiplier process being truncated by increasing real import penetration. The panel showing private investment as a share of GNP reveals that the crowding out of domestic absorption that takes place in MCM and OECD is of private investment, which is slightly above baseline throughout for EPA, but increasingly below baseline for MCM, and especially for OECD.

The situation is quite different in the case of the United States. Here, all the models agree that the current account deficit will continue to grow as a share of baseline GNP, reaching 0.5 per cent by the sixth year. As shown by Fig. 4, however, this agreement about the current account effects is the net result of some offsetting differences. Although all three models show declining real multipliers for the United States, the first-year multiplier is about 1.75 for MCM compared to about 1.0 for the OECD, with EPA midway between.

Although all three models show steady crowding out of the US GNP effects as time progresses, the MCM multiplier falls much less slowly than the other two, and is still above 1.0 in the sixth year. There is an offsetting difference in the behaviour of real absorption, which is continually falling, relative to its initial increase, in MCM and OECD, while consistently remaining roughly 1.5 per cent above baseline values for EPA. Higher investment is the key to the sustained absorption in EPA, with investment higher by almost 1 per cent of GNP by the sixth year. In the other two models, investment is below baseline by increasing amounts, averaging about 0.25 per cent of GNP over the six year period.

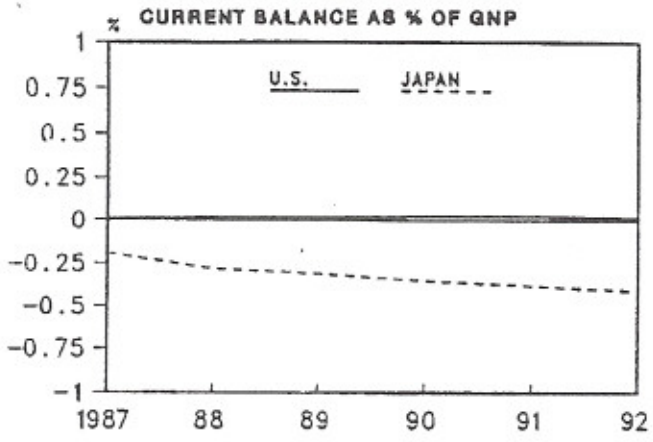
The models also reveal some substantial differences in US private savings behaviour, with savings up by much more than the induced change in GNP in OECD, up only slightly in MCM, and with the EPA falling in between. The EPA private savings (as a percentage of GNP) continually rises, thus helping to finance the growing government deficit.

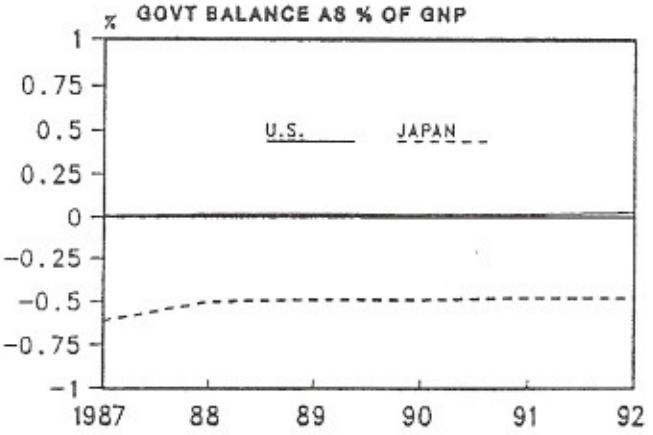
Figs. 5 through 10 broaden the focus to consider both the own-country and the cross-country effects of Japanese and US and fiscal policies on a comparative basis. To do this, there are two figures for each of the three models. The left-hand panels of each figure show

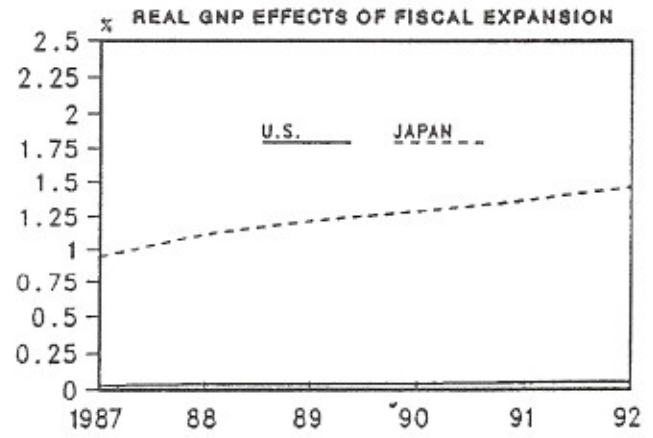
Figure 5

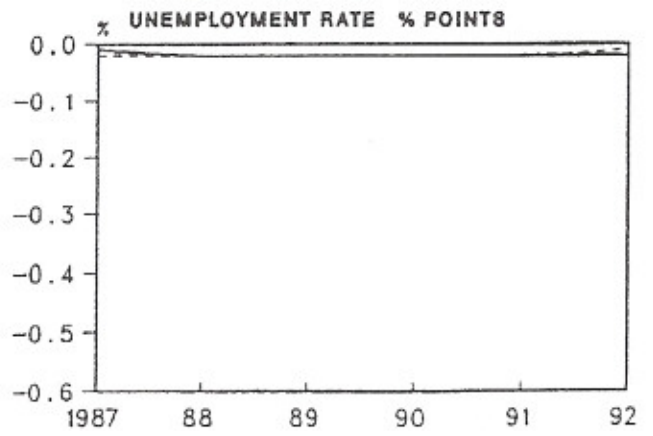
EPA

JAPANESE FISCAL EXPANSION

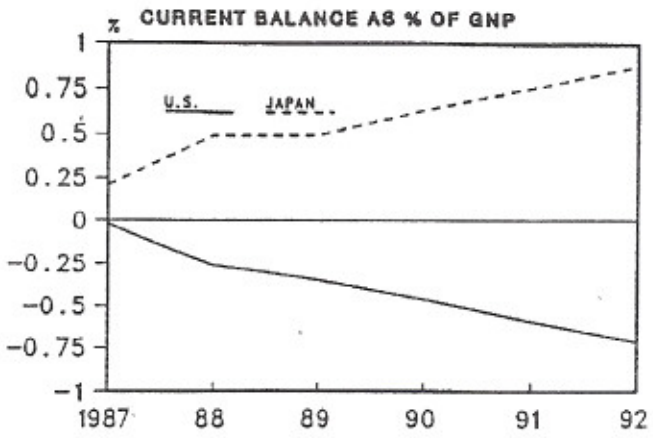


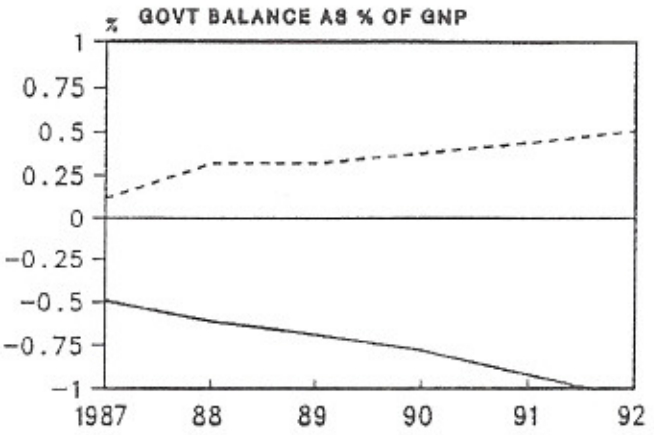


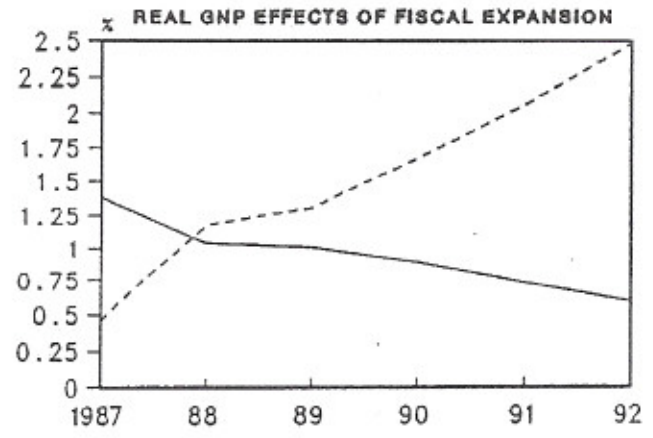


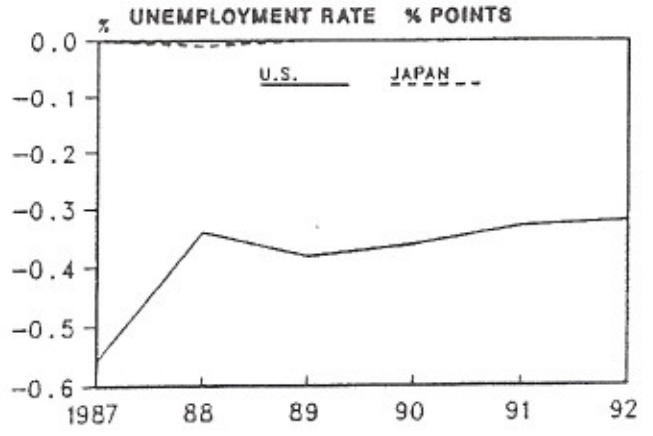


U.S. FISCAL EXPANSION









the own-country and cross-country effects of Japanese fiscal expansion, while the right-hand panels do the same for US fiscal expansion. What are the main points of similarity and difference revealed by these figures?

Important points of similarity include:

– In all three models, US fiscal policy has large and growing effects on the current accounts of both countries, with the effects on Japan being about as large as those on the United States, when measured as a percentage of GNP.

– In all three models, Japanese fiscal policy initially affects the Japanese current balance by about as much as does the US fiscal expansion (although of course in the opposite direction), while the influence on the US current account is close to zero.

– In all three models, US interest rates rise by substantial amounts that increase as the US fiscal expansion continues. By the sixth year, US long-term rates are 150 to 200 basis points higher in nominal terms. Japanese interest rates are pulled up by about one-third as much (less in MCM) in response to the US fiscal expansion.

– In all three models, US fiscal expansion produces continuing US inflation averaging about 0.5 per cent annually in each of the models. Thus real long-term interest rates are 100 to 150 basis points higher by the sixth year.

– In all three models, US fiscal expansion produces a substantial change in the US unemployment rate, while Japanese fiscal expansion has almost no impact on the Japanese unemployment rate.

The most striking of these results is the contrast between the very large current account effects of US fiscal expansion and the much smaller effects of Japanese fiscal expansion. This asymmetry has been the subject of much comment, and will be analysed in some detail in the next section of the paper.

Important differences among the models include:

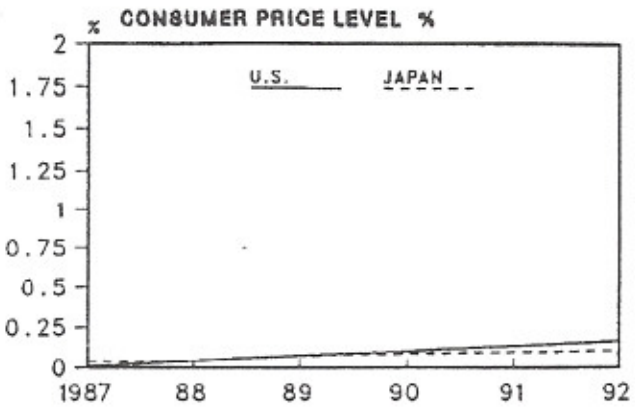
– Although all three models show the Japanese GNP effects of US fiscal expansion to be greater than the US effects by the sixth year, the difference is much greater for EPA, which shows Japanese GNP up by over 2 per cent by the fifth year. This appears to reflect a possibly non-convergent real multiplier process in the Japanese block of the EPA model.

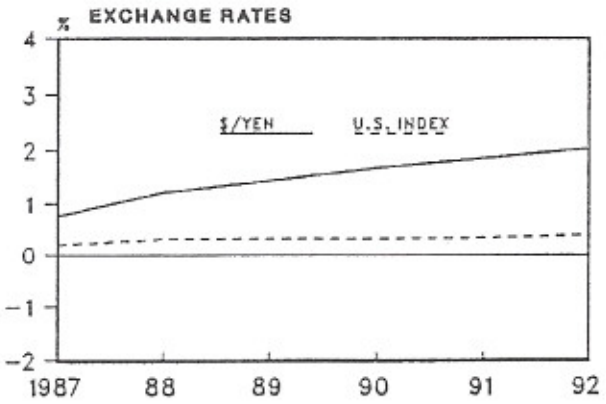
– Although none of the models shows large changes in the Japanese price level in response to Japanese fiscal expansion, there are noticeable differences among the models. There is no induced inflation in

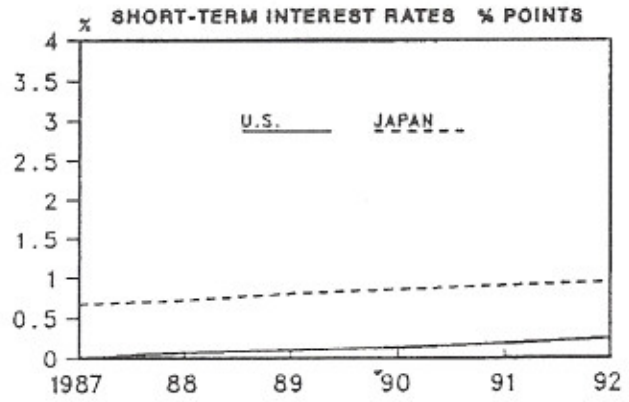
Figure 6

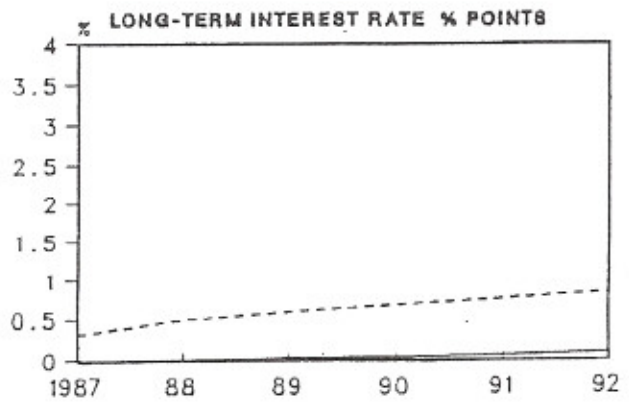
EPA

JAPANESE FISCAL EXPANSION

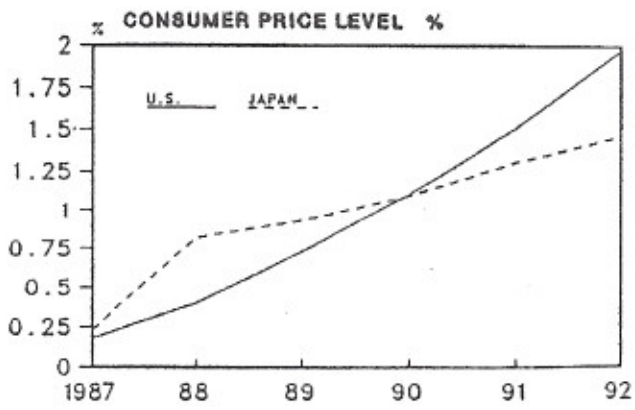


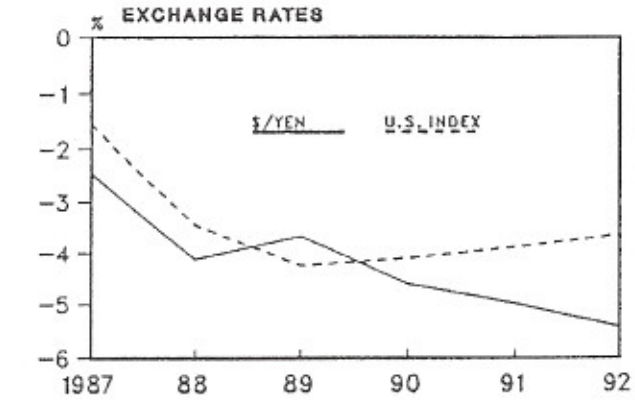


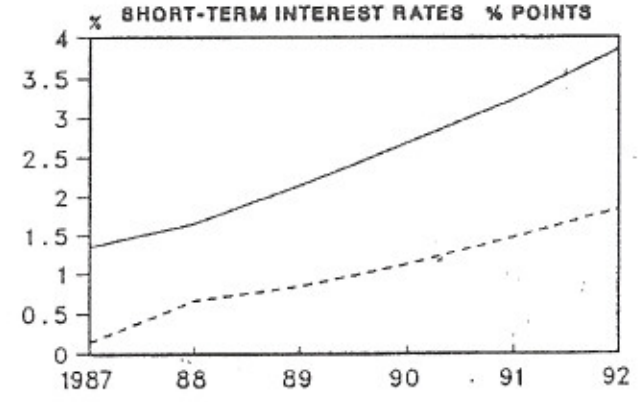


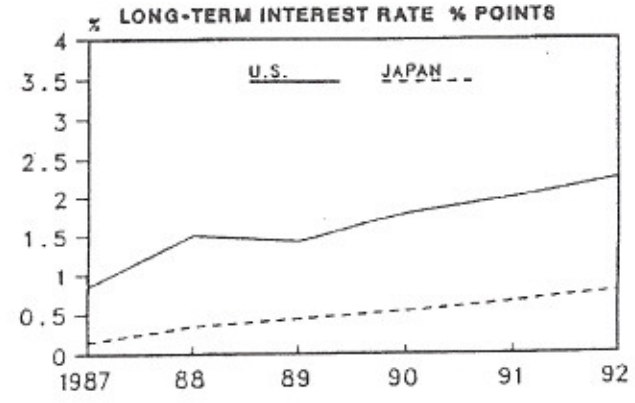


U.S. FISCAL EXPANSION









EPA, despite the much stronger multiplier process in operation in that model.

– By contrast, in response to US fiscal expansion, the EPA model shows substantial Japanese inflation, even more than in the United States over the first two years, while MCM shows about one-third as much inflation as in the United States and the OECD almost none.

– In both EPA and MCM, the US dollar appreciates by about 3 per cent in nominal terms in response to US fiscal expansion, while the OECD model shows a depreciation of the dollar.

– In real terms, MCM shows the real value of the dollar returning to baseline by the sixth year, while EPA shows a real appreciation of about 4 per cent and OECD a real appreciation of about 2 per cent.

– The initial depreciation of the dollar in OECD under US fiscal expansion appears to be related primarily to the movement of short-term interest rates outside the United States. In that model, Japanese short-term rates rise almost as much as US rates in response to US fiscal expansion, while the induced changes in Japanese interest rates are much smaller in the other two models.[7]

– All three models show initial appreciation of the yen in response to Japanese fiscal expansion, although by the sixth year the combination of price and exchange rate changes are such that the real value of the yen is up by 2 per cent in EPA, and down by 1 per cent in MCM and OECD.

The most striking of the differences listed above relate to the multiplier process in the EPA model and to the different movements of exchange rates. The latter issue will be addressed further in §4, which analyses in more detail the role of exchange rate changes in the transmission of the effects of fiscal policy.

3. Asymmetries in current balance effects

This section attempts to spell out in more detail why the models show that US fiscal policies have much larger effects on the Japanese current account than vice versa. To do this most clearly, it is perhaps helpful to start with the simplest case, where relative prices are initially unchanged and all current account effects are due to increases in real

[7] Viewed in terms of conventional LM and BP curves, a depreciation in response to fiscal expansion arises if the LM curve is flatter than the BP curve. The rise in foreign interest rates can be treated as an upward shift of the BP curve, increasing the chances that the LM and IS curves, after the latter has shifted right in response to fiscal expansion, should intersect below the BP curve, thus indicating incipient depreciation.

Figure 7

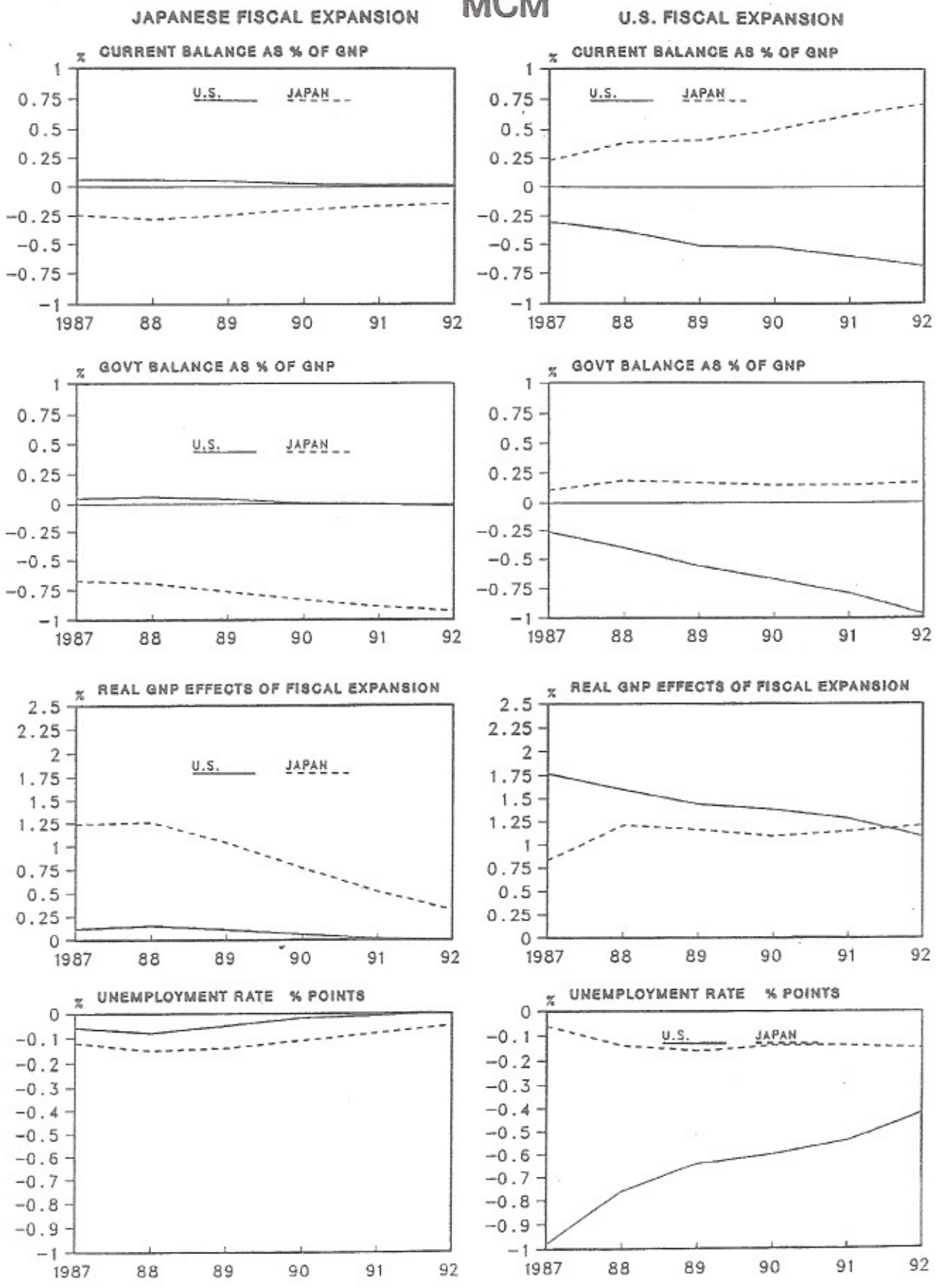

MCM
JAPANESE FISCAL EXPANSION
U.S. FISCAL EXPANSION
% CURRENT BALANCE AS % OF GNP
% GOVT BALANCE AS % OF GNP
% REAL GNP EFFECTS OF FISCAL EXPANSION
% UNEMPLOYMENT RATE % POINTS
U.S.
JAPAN
1987
88
89
90
91
92

Figure 8

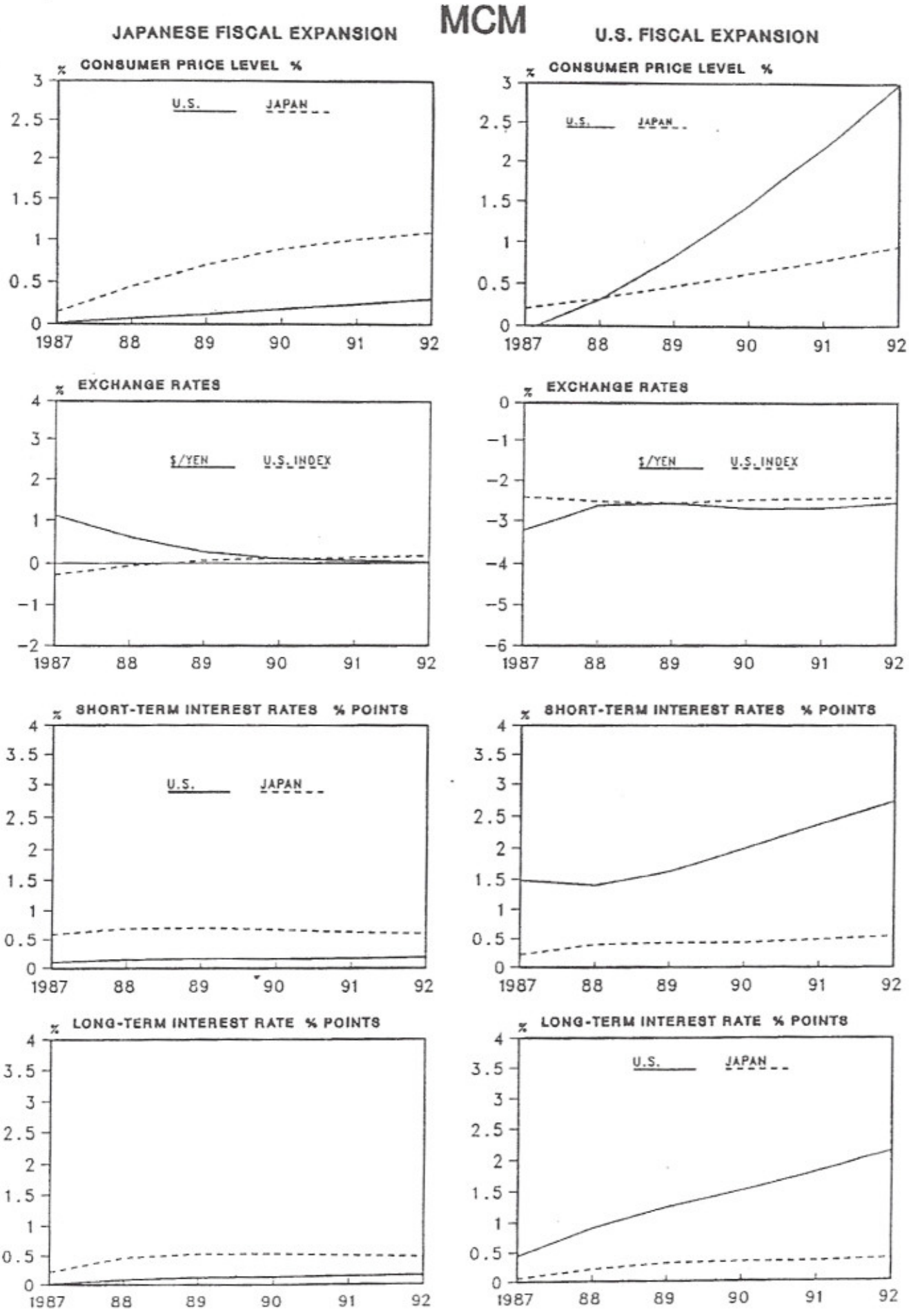

MCM
JAPANESE FISCAL EXPANSION
U.S. FISCAL EXPANSION
% CONSUMER PRICE LEVEL %
U.S.
JAPAN
% EXCHANGE RATES
$/YEN
U.S. INDEX
% SHORT-TERM INTEREST RATES % POINTS
% LONG-TERM INTEREST RATE % POINTS
1987
88
89
90
91
92

Figure 9

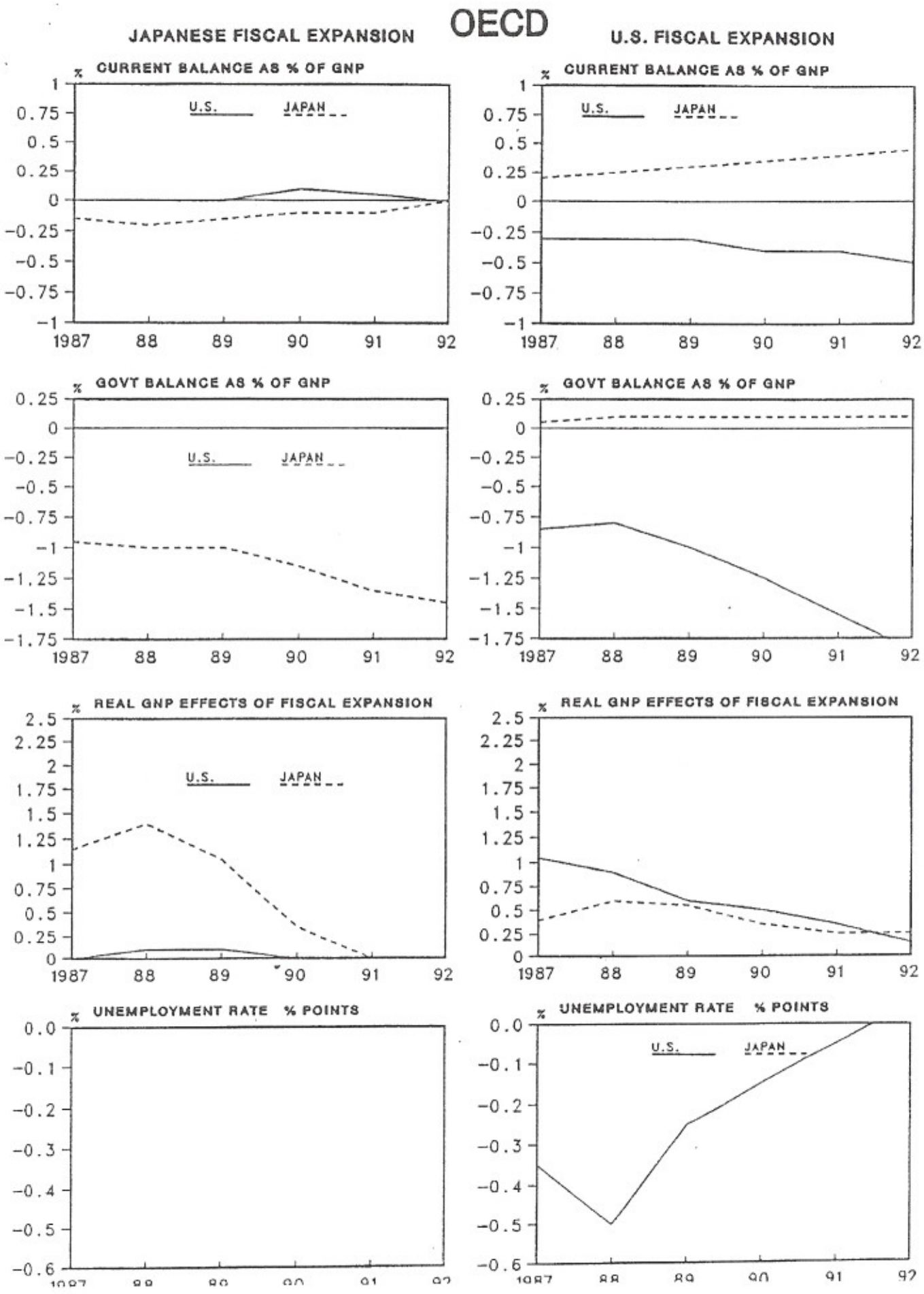
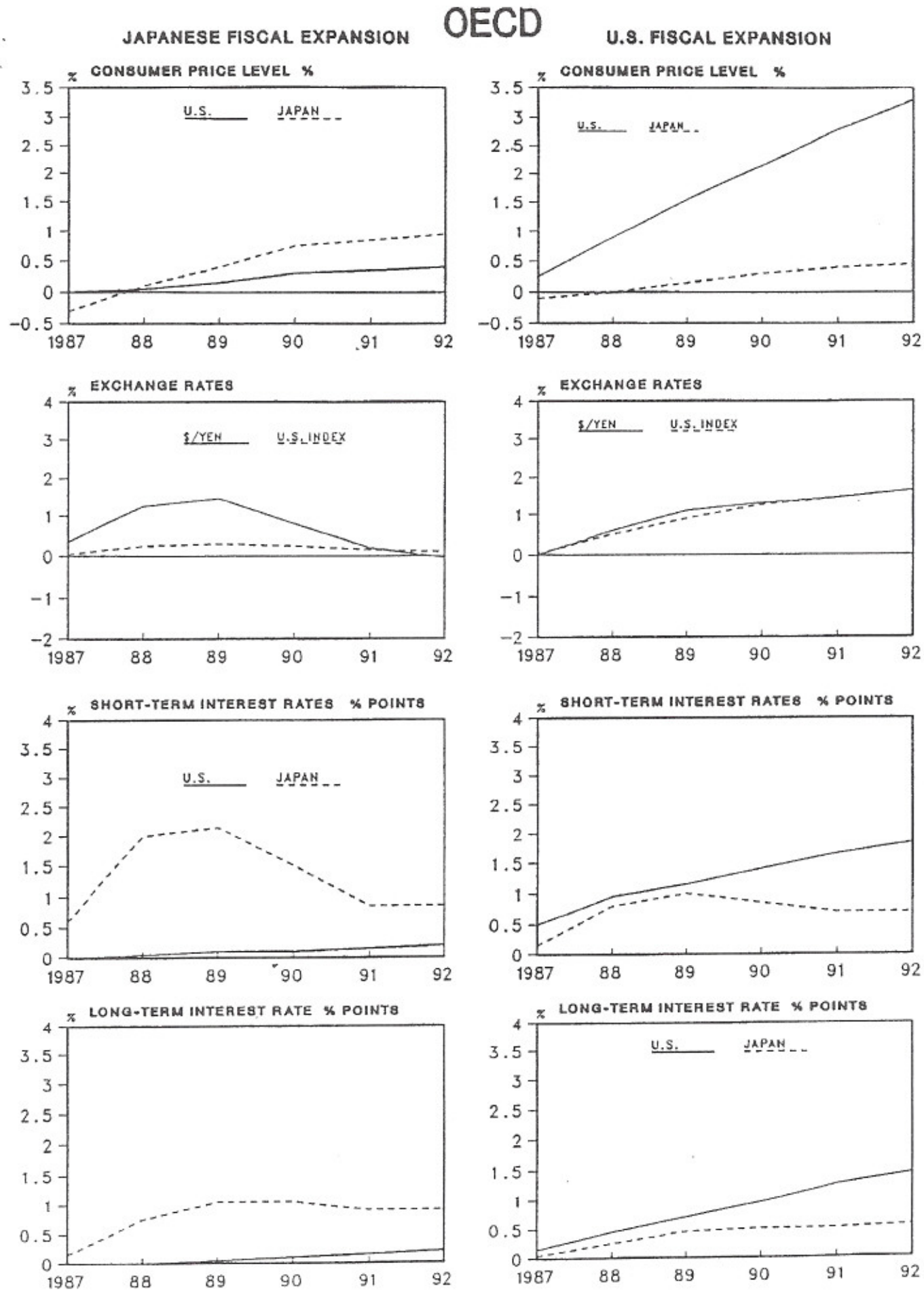

OECD
JAPANESE FISCAL EXPANSION
U.S. FISCAL EXPANSION
CURRENT BALANCE AS % OF GNP
GOVT BALANCE AS % OF GNP
REAL GNP EFFECTS OF FISCAL EXPANSION
UNEMPLOYMENT RATE % POINTS
U.S.
JAPAN
%
1987
88
89
90
91
92

Figure 10


OECD
JAPANESE FISCAL EXPANSION
U.S. FISCAL EXPANSION
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imports of the country undertaking fiscal expansion. In that simple case, the effect of US fiscal expansion on the Japanese current account depends only on the US multiplier, the US marginal propensity to import, and the marginal share of US imports that comes from Japan. A similar relationship, with the names changed, determines the effects of Japanese fiscal expansion on the US current account.

If one compares the Japanese current account effects of US fiscal expansion to the US current account effects of Japanese fiscal expansion, measuring the effects in relation to the second country's GNP, then the relative size of the countries enters in two ways. First, if the fiscal expansion is defined in relation to GNP, then the initial increase in spending will be larger if the larger country expands. Second, for given trade ratios and import propensities, any change in real trade flows will be a larger share of the smaller country's GNP. Using purchasing power parity exchange rates,[8] US GNP was about 2.8 times as large as that of Japan in 1987. This would imply that if the two countries had the same propensity to import from each other, and if both countries had the same domestic expenditure multipliers, then US fiscal expansion of 1 per cent of US GNP would affect the Japanese current account (measured as a percentage of Japanese GNP) by about eight times as much ($2.8 \times 2.8 = 7.84$) as a Japanese fiscal expansion of 1 per cent of GNP would affect the US current account, measured as a percentage of US GNP.

To take a concrete example, the top right-hand panels of Figs. 5, 7, and 9 show that US fiscal expansion improves the Japanese current balance, in the first year, by about 0.25 per cent of GNP. If the structures of the two economies were identical, in the manner described above, then one would expect to find in the top left panel of the same figures that the US current balance would improve by about 0.03 per cent ($= 0.25/7.84$) of US GNP in response to the Japanese fiscal expansion. On average over the first year, the MCM improvement is about 0.045 per cent, while in EPA and OECD it is substantially less, about 0.01 per cent.

In the rest of this section, we shall take a more systematic look at the nature and the sources of these differences, separating the influences operating through exchange rate changes, second-round trade effects, and trade in services. This will be done by a series of five tables, each of which builds upon the previous tables.

Table 1 starts by showing the induced real current account effects in the expanding country. The first columns show how induced real

[8]The PPP exchange rates are from Blades and Roberts (1987).

Table 1. Real trade effects of Japanese and US fiscal policies
(Increase in government expenditures equal to 1 per cent of real baseline GNP)

	1 Fiscal multiplier (with exogenous exchange rates)	2 Marginal propensity to import goods (with exogenous exchange rates)[1]	3 Fiscal multiplier (with endogenous exchange rates)	4 Marginal propensity to import goods (with endogenous exchange rates)	5 Change in real merchandise imports (in billions of local currency)[2]	6 Column 5 as a per cent of baseline real GNP	7 Change in real current account balance as a per cent of baseline real GNP
			EPA			(%)	(%)
First year impact							
Impact on Japan of Japanese fiscal shock	1.00	0.12	0.95	0.14	403.29	0.133	−0.22
Impact on US of US fiscal shock	1.40	0.12	1.39	0.15	7.75	0.209	−0.18
Third year impact							
Impact on Japan of Japanese fiscal shock	1.35	0.14	1.22	0.17	677.86	0.207	−0.39
Impact on US of US fiscal shock	0.92	0.35	1.01	0.40	16.40	0.404	−0.61
			MCM[3]				
First year impact							
Impact on Japan of Japanese fiscal shock	1.42	0.11	1.24	0.14	574.13	0.174	−0.17
Impact on US of US fiscal shock	1.81	0.18	1.77	0.21	14.21	0.372	−0.11
Third year impact							
Impact on Japan of Japanese fiscal shock	1.13	0.12	1.04	0.14	481.06	0.146	−0.17
Impact on US of US fiscal shock	1.57	0.15	1.44	0.20	11.68	0.288	−0.13

Table 1. Continued

	1 Fiscal multiplier (with exogenous exchange rates)	2 Marginal propensity to import goods (with exogenous exchange rates)[1]	3 Fiscal multiplier (with endogenous exchange rates)	4 Marginal propensity to import goods (with endogenous exchange rates)	5 Change in real merchandise imports (in billions of local currency)[2]	6 Column 5 as a per cent of baseline real GNP	7 Change in real current account balance as a per cent of baseline real GNP
			OECD			(%)	(%)
First year impact							
Impact on Japan of Japanese fiscal shock	1.15	0.12	1.15	0.12	425.96	0.138	−0.19
Impact on US of US fiscal shock	1.05	0.40	1.05	0.40	16.06	0.420	−0.41
Third year impact							
Impact on Japan of Japanese fiscal shock	1.15	0.17	1.05	0.21	728.53	0.221	−0.33
Impact on US of US fiscal shock	0.55	0.67	0.60	0.59	14.35	0.354	−0.42

Japanese fiscal shock (1980 BY)	US fiscal shock (1982 B$)	Average Japanese propensity to import	Average US propensity to import	US GNP relative to Japanese GNP	Japanese imports from the US relative to total Japanese imports	US imports from Japan relative to total US imports
1987 : 3086.70	1987 : 38.24	1987 : 0.09	1987 : 0.10	1987 : 2.8 [4]	0.22 [5]	0.21 [4]
1989 : 3304.00	1989 : 40.54	1989 : 0.09	1989 : 0.08	1987 : 2.8 [4]		

[1] Change in merchandise imports from baseline relative to the change in real GNP.
[2] In 1982 prices in the United States and 1980 prices in Japan.
[3] Results based on fourth quarter 1987 observations from IMF direction of Trade Statistics.
[4] GNP in Japan and the US are compared using PPP as calculated by the OECD (see Blades and Roberts).
[5] Based on first three quarters of 1987 (see IMF Direction of Trade Statistics).

imports can be explained as the product of the fiscal multiplier and the marginal propensity to import. Columns 1 and 2 show the multipliers and marginal propensities to import under fixed exchange rates,[9] and columns 3 and 4 show how these two numbers are altered by the induced changes in exchange rates. The propensities to import are for merchandise only, because of the restricted information available about service imports in real terms. The numbers in column 5 for induced real merchandise imports are thus equal to the increase in government spending, measured in billion 1980 yen for Japan and in billion 1982 dollars for the United States, times the flexible exchange rate multiplier (from column 3) times the marginal propensity to import (from column 4).[10] Column 6 shows the column 5 figures as a percentage of baseline real GNP, while column 7 reports the change in the real current account balance as a percentage of GNP. Column 7 is thus equal to the negative of column 6 plus any induced changes in real merchandise exports and net real exports of services.

Comparing the results for the United States and Japan, we might expect to find fairly similar values in column 6 for the United States and Japan, assuming the same fiscal multipliers, since, as shown at the bottom of the table, Japan and the United States had about the same average propensities to import in 1987. All three models show induced real imports in the first year to be substantially larger for the United States than for Japan: more than 50 per cent larger in the case of EPA, twice as large in MCM and more than three times as large in OECD.

The reasons for the larger bulge in US imports differ by model. In the case of EPA, the import propensities are approximately the same in the two countries, and the difference is due entirely to the larger first-year fiscal multiplier in the United States. For MCM, the fiscal multipliers and the marginal propensities are both about 50 per cent larger for the United States than for Japan. For both EPA and MCM, the differences are larger with flexible than with fixed exchange rates, as would be expected in the light of the greater real appreciation of the dollar[11] that takes place in those models. For OECD, the difference

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[9] These are obtained from the results of the fiscal expansions run with exogenous exchange rates.

[10] The 'marginal propensities' reported are not the partial effect of real GNP on real imports, but the total change in real imports divided by the total change in real GNP. The numbers reported in column 5 can thus be obtained directly from the simulation output.

[11] The comparison being made here is between the appreciation of the dollar under US fiscal expansion and the appreciation of the yen under Japanese fiscal expansion.

Table 2. Fiscal impact on total and bilateral real merchandise imports

	Impact of Japanese fiscal expansion (in real terms)		Impact of US fiscal expansion (in real terms)	
	1	2	3	4
	Japanese import change/ Japanese GNP[1]	Change in Japanese imports from US/ US GNP	US import change/ US GNP[1]	Change in US imports from Japan/ Japanese GNP
	(%)	(%)	(%)	(%)
		EPA		
First Year	0.133	0.010[2]	0.209	0.123[3]
Third Year	0.207	0.016[2]	0.404	0.238[3]
		MCM		
First Year	0.174	0.014[2]	0.372	0.219[3]
Third Year	0.146	0.011[2]	0.288	0.169[3]
		OECD		
First Year	0.138	0.011[2]	0.420	0.247[3]
Third Year	0.221	0.017[2]	0.354	0.208[3]

[1] Obtained from column 6 of Table 1.
[2] Column 1 × (0.22/2.8).
[3] Column 3 × (0.21 × 2.8).

Table 3. Index of asymmetries in the effects of US and Japanese fiscal expansion on induced real merchandise imports[1]

	1	2	3	4	5
	Index of total asymmetry[2]	Index of asymmetry in trade patterns[3]	Index of asymmetry in sizes of US and Japanese economies[4]	Index of asymmetry in fiscal multipliers[5]	Index of asymmetry in marginal propensities to import[6]
			EPA		
First Year	11.732	0.955	7.840	1.463	1.071
Third Year	14.578	0.955	7.840	0.828	2.353
			MCM		
First Year	16.023	0.955	7.840	1.427	1.500
Third Year	14.803	0.955	7.840	1.385	1.429
			OECD		
First Year	22.776	0.955	7.840	0.913	3.333
Third Year	12.015	0.955	7.840	0.571	2.810

[1] A value of 1 indicates no asymmetry. A value greater than 1 indicates a greater impact from the US

[2] Column 4 of Table 2 / Column 2 of Table 2.

The index of asymmetry in column 1 equals the product of columns 2 through 5 (excluding rounding off errors).

[3] 0.21 / 0.22

[4] 2.8 / 1/2.8

[5] US Fiscal multiplier with endogenous exchange rate / Japanese fiscal multiplier.

[6] US Marginal propensity to import with endogenous exchange rate / Japanese marginal propensity to import.

appears to be entirely due to a much higher US marginal propensity to import goods. This is not due to exchange rate effects, as the US depreciates in nominal terms in that model in response to US fiscal expansion.

How do these comparisons change when account is taken of induced real exports of goods, and of net exports of services? For both EPA and MCM, taking these changes into account more than offsets the higher US imports of goods, so that the induced real trade deficit is higher for Japan than for the United States. Before discussing these effects in slightly more detail, we first consider Tables 2 and 3, which spell out more systematically the sources of the asymmetries flowing through real merchandise imports.

Table 2 simply restates the induced real imports of goods in terms of the real GNPs of the two countries, to provide raw material for Table 3, which shows indices of asymmetry and reveals their sources. The total index shown in column 1 of Table 3 is, as discussed before, the ratio of the effects of US fiscal policy (on Japanese merchandise exports to the United States) to the effects of Japanese fiscal expansion (on US merchandise exports to Japan), where the fiscal expansion is 1 per cent of real GNP and the induced real exports are measured as a percentage of the exporting country's real GNP. Columns 2 to 5 of Table 3 show the components explaining the over-all index of asymmetry. The index in column 1 is the product of the sub-indices in columns 2 to 5, and would take the value of 1.0 if the two countries had exactly the same size and economic structure.

Table 3 shows that the first-year indices of asymmetry range from about 12 for EPA to 16 for MCM and 23 for OECD, in all cases well above the value of 7.8 that would be accounted for simply by the differences in the sizes of Japan and the United States. For EPA, the additional asymmetry flows mainly from the higher value of the US multiplier. For MCM there is an equally large additional effect from the higher US marginal propensity to import. For OECD, the high asymmetry is entirely due to a marginal propensity to import that is more than three times as high for the United States as for Japan. Trade patterns are not part of the explanation of the observed asymmetry, as the index in column 2 is under 1.0, reflecting the fact that in 1987 the United States obtained 21 per cent of its merchandise imports from Japan, while Japan obtained 22 per cent of its merchandise imports from the United States.[12]

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[12] These percentages are based on merchandise trade data for the first three quarters of 1987.

Table 4. Effects of US and Japanese fiscal expansion on the US current account[1]
(Billions of US Dollars)

	1		2	3		4	5
	Principal trade linkages		Approximate terms of trade effects	Total effects on trade balance		Effects on net services	Effects on current account
	Real	Nominal	Nominal	Real	Nominal	Nominal	Nominal
EPA	Change in US merchandise imports						
US fiscal policy							
Year 1	7.75	4.62	2.80	-7.28	-4.60	0.84	-3.55
Year 3	16.40	14.78	3.91	-14.82	-12.46	-8.12	-20.58
	Change in US merchandise exports						
Japanese fiscal policy							
Year 1	0.69	0.93	-0.55	0.78	0.30	0.30	0.61
Year 3	1.96	2.92	-0.74	1.72	1.28	0.94	2.22
MCM	Change in US merchandise imports						
US fiscal policy							
Year 1	14.57	12.62	3.25	-13.39	-13.13	-4.06	-16.53
Year 3	11.71	11.96	6.03	-14.65	-14.94	-12.85	-26.53
	Change in US merchandise exports						
Japanese fiscal policy							
Year 1	2.64	3.39	-0.90	3.74	3.57	1.08	4.88
Year 3	2.70	4.44	-0.40	3.10	4.02	0.15	4.62

Table 4. Continued

	1		2	3		4	5
	Principal trade linkages		Approximate terms of trade effects	Total effects on trade balance		Effects on net services	Effects on current account
	Real	Nominal	Nominal	Real	Nominal	Nominal	Nominal
OECD							
	Change in US merchandise imports						
US fiscal policy							
Year 1	16.55	17.90	-0.34	-14.67	-15.65	-0.65	-16.35
Year 3	14.48	26.40	-0.94	-10.84	-17.00	-3.10	-20.10
	Change in US merchandise exports						
Japanese fiscal policy							
Year 1	1.12	1.24	-0.36	0.74	0.28	0.76	0.95
Year 3	3.01	6.40	-2.55	2.68	1.30	2.81	4.20

[1] Real fiscal expansion in both countries equal to 1982 $38.24 billion in 1987 and 1982 $40.54 billion in 1989. Nominal fiscal expansion equal to $44.50 billion in 1987 and $51.62 billion in 1989.

Table 5. Effects of Japanese and US fiscal expansion on the Japanese current account[1]
(100 Billions of Yen)

	1		2	3		4	5
	Principal trade linkages		Approximate terms of trade effects	Total effects on trade balance		Effects on net services	Effects on current account
	Real	Nominal	Nominal	Real	Nominal	Nominal	Nominal
EPA	Change in Japanese merchandise imports						
Japanese fiscal policy							
Year 1	4.03	1.35	−0.00	-4.80	-3.04	-2.26	−5.26
Year 3	6.78	2.14	0.47	-8.71	-5.48	-5.17	−10.60
	Change in Japanese merchandise exports						
US fiscal policy							
Year 1	3.10	3.78	−0.70	2.71	1.79	2.52	4.24
Year 3	8.02	8.21	−14.36	6.15	4.10	6.46	10.39
MCM	Change in Japanese merchandise imports						
Japanese fiscal policy							
Year 1	5.96	1.71	1.25	-7.43	-4.92	-1.92	-7.11
Year 3	5.18	2.90	1.46	-6.69	-5.27	-2.04	-8.02
	Change in Japanese merchandise exports						
US fiscal policy							
Year 1	5.26	4.91	-1.84	5.84	3.88	1.94	4.97
Year 3	5.43	5.70	-1.48	5.77	6.06	4.94	9.10

Table 5. Continued

	1		2	3		4	5
	Principal trade linkages		Approximate terms of trade effects	Total effects on trade balance		Effects on net services	Effects on current account
	Real	Nominal	Nominal	Real	Nominal	Nominal	Nominal
OECD							
	Change in Japanese merchandise imports						
Japanese fiscal policy							
Year 1	4.46	2.00	−0.39	-4.13	−2.50	-1.00	-4.00
Year 3	7.69	3.50	1.13	-9.47	−6.00	-1.50	-4.00
	Change in Japanese merchandise exports						
US fiscal policy							
Year 1	4.57	4.73	−0.12	3.74	3.95	0.00	3.68
Year 3	4.90	5.75	0.15	3.26	4.50	1.75	6.00

[1] Real fiscal expansion in both countries equal to 1980 Y30.87 hundred billion in 1987 and 1980 Y33.04 hundred billion in 1987. Nominal fiscal expansion equal to Y33.91 hundred billion in 1987 and Y37.37 hundred billion in 1989.

Tables 4 and 5 extend the analysis to cover the entire current account in nominal terms, thus including the effects of terms-of-trade changes along with the effects of changes in the volumes of goods and services exports. Table 4 examines the US current balance effects of US and Japanese fiscal expansion, while Table 5 shows the effects of the same policies on the Japanese current balance. To remove the asymmetry caused by the different size of the expenditure increase in the two countries, the size of the Japanese fiscal expansion is scaled up in Table 4 to be equal to 1 per cent of US GNP, the same as the fiscal expansion in the United States. This requires the Japanese results to be multiplied by 1.9, which is the ratio of US to Japanese GNPs in 1987, when evaluated at average 1987 exchange rates.[13] Similarly, in Table 5 the size of the US fiscal expansion is scaled down to make it equal to 1 per cent of Japanese GNP. The numbers in Table 4 are reported in billion US dollars (at 1982 prices for the real variables), while the results in Table 5 are in 100 billion yen (at 1980 prices for the real variables).

The figures in column 5 of Table 4 show that, by the end of the third year, a $50 billion increase in US spending would worsen the US current account by about $20 billion (slightly more in MCM), while a similar amount of spending in Japan would improve the US current account by $4 to $5 billion in MCM and OECD, and about $2 billion in EPA.

In the EPA and MCM results, the higher value of the US dollar brought about by fiscal expansion produces terms-of-trade gains (shown in column 2, and included as part of the column 5 figure) averaging about $3 billion in the first year. For OECD, with its slight depreciation of the dollar in response to either US or Japanese fiscal expansion, there are terms-of-trade losses to the United States in both cases. EPA and MCM show yen appreciation in response to Japanese fiscal expansion, so they agree with OECD in showing terms-of-trade losses to the United States in this case.

Table 5 shows the effects of Japanese and scaled-down US fiscal expansion on the Japanese current balance, measured in 100 billion yen. In the first year a fiscal expansion of roughly 3,500 billion yen worsens the Japanese current account by roughly 5 to 7 hundred

[13]The ratio of GNPs at market exchange rates is used to make the fiscal expansion the same size, in terms of US dollars, in both countries, so as to facilitate the comparisons in terms of the changes to current accounts in nominal terms. Since market value of the yen was well above its PPP value in 1987 (almost 50 per cent above, as reported by Blades and Roberts (1987)), this implies that the real value of the Japanese fiscal expansion is substantially less than in the United States, by roughly the ratio 1.9/2.8.

billion yen if the fiscal expansion takes place in Japan, or improves the Japanese current balance by 3.5 to 5 hundred billion yen if the fiscal expansion takes place in the United States.

The reasons for the differences between the results in Tables 4 and 5 lie in the higher US marginal propensity to import (especially as modelled by OECD) and in the higher US multipliers, initially in EPA and throughout for MCM. As has already been seen, the crowding out of domestic output in the United States increases as time passes, with a larger fraction of the additional US spending taking the form of imports. In the way our calculations have been made, this shows up as a higher US marginal propensity to import, which then increases the effects of the US fiscal policy on the Japanese current balance. There is less tendency for this to happen in response to Japanese fiscal policy, so that US fiscal expansion eventually has larger effects on the Japanese current balance than does Japanese policy.

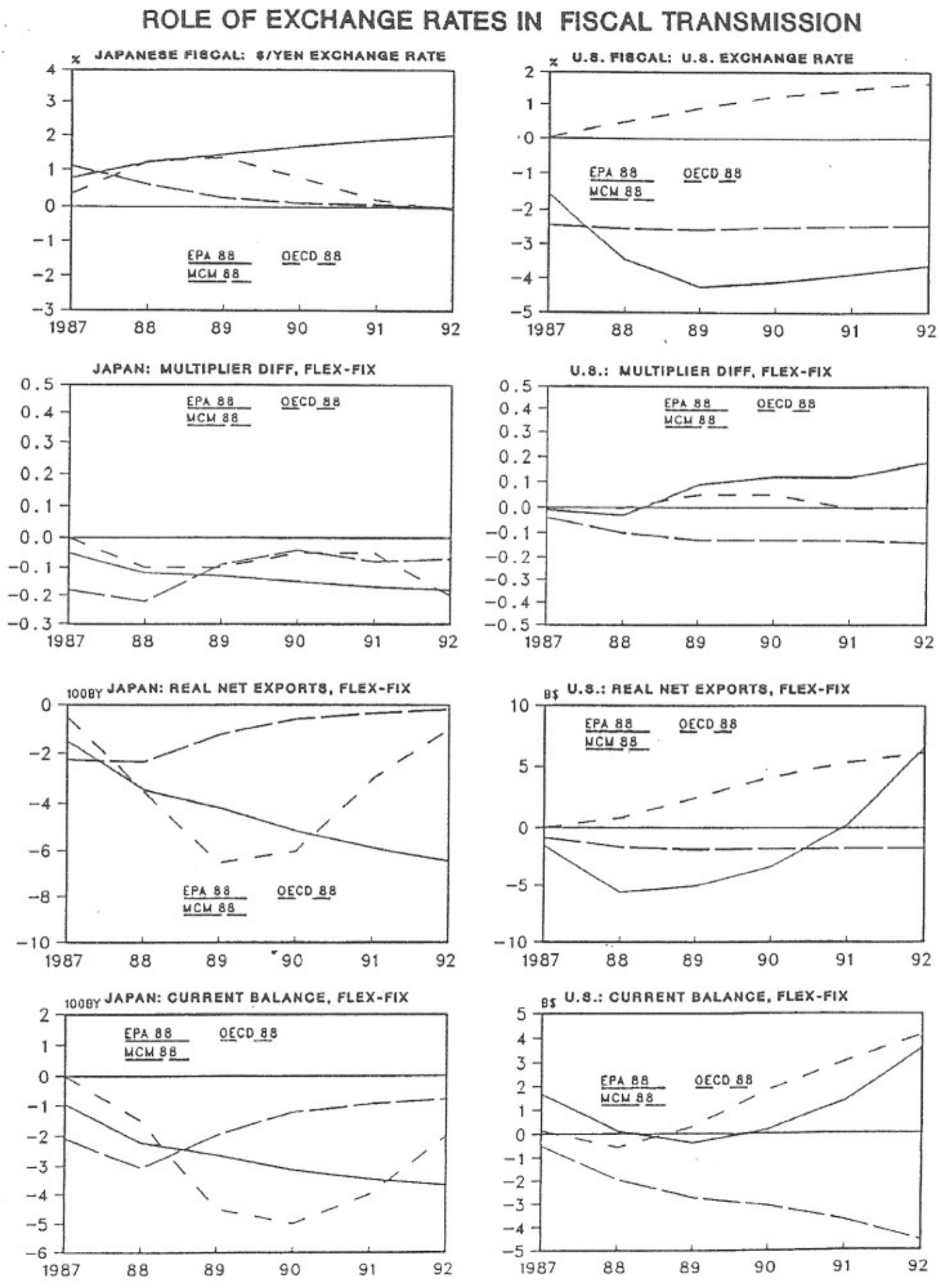
4. The role of exchange rates

In discussions about the policies required to remove external imbalances, there are often disagreements about the relative roles to be played by fiscal policies and by exchange rate changes. At one extreme, it is argued, for example, that a reduction in the external value of the US dollar will suffice to restore US current account balance. At the other extreme, it is argued that an exchange rate change is neither necessary nor desirable, and that a drop in the value of the US dollar would induce inflationary effects in the United States and recessionary effects abroad that would remove any positive effects on the balance of payments.

The evidence presented so far in this paper suggests that exchange rates do move as part of the adjustment to fiscal policy, but their relative importance, either as a part of the translation of fiscal actions to external balances, or as independent instruments, remains to be assessed. This is done in Fig. 11, which shows how much difference exchange rate movements make to the income and current balance effects of fiscal policy.

The left-hand side of Fig. 11 shows the effects on Japan of Japanese fiscal expansion, with the right-hand side doing the same for the United States. The top panels show the exchange rate changes that are triggered by the fiscal expansion, with all fiscal expansions showing appreciations of the local currency except for US fiscal expansion in the OECD model. The next panels show the difference between the fiscal multipliers triggered by these changes in exchange rates, and the

Figure 11


ROLE OF EXCHANGE RATES IN FISCAL TRANSMISSION
% JAPANESE FISCAL: $/YEN EXCHANGE RATE
EPA 88
MCM 88
OECD 88
% U.S. FISCAL: U.S. EXCHANGE RATE
EPA 88
MCM 88
OECD 88
JAPAN: MULTIPLIER DIFF, FLEX-FIX
EPA 88
MCM 88
OECD 88
U.S.: MULTIPLIER DIFF, FLEX-FIX
EPA 88
MCM 88
OECD 88
100BY JAPAN: REAL NET EXPORTS, FLEX-FIX
EPA 88
MCM 88
OECD 88
B$ U.S.: REAL NET EXPORTS, FLEX-FIX
EPA 88
MCM 88
OECD 88
100BY JAPAN: CURRENT BALANCE, FLEX-FIX
EPA 88
MCM 88
OECD 88
B$ U.S.: CURRENT BALANCE, FLEX-FIX
EPA 88
MCM 88
OECD 88
1987
88
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bottom two rows show the resulting changes in real net exports and in nominal current balances.

The multiplier results show a difference among the models in the real output effects of exchange rate change. All three models show lower multipliers in response to the appreciations of the yen, and MCM shows a parallel result for the United States. OECD shows the dollar to depreciate, and has a slightly higher multiplier as a consequence. The exception to the pattern is provided by EPA, which shows a higher multiplier (after the second year) in response to the appreciation of the dollar.

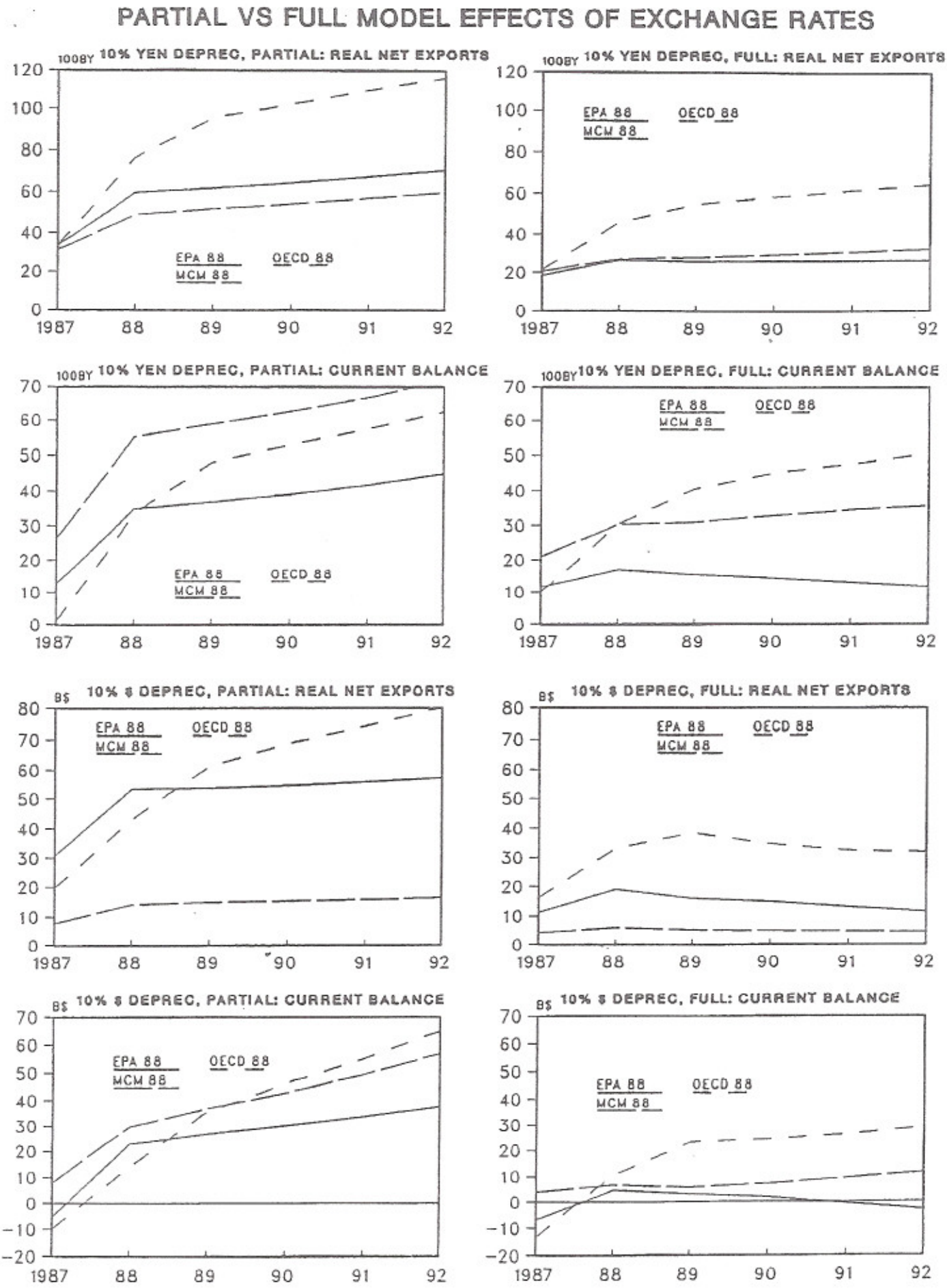
The current balance results show that the induced appreciations do tend to contribute to the current account effects of the fiscal policies, but that the contributions are a small part of the total current balance effects shown in earlier figures. Since the induced exchange rate changes vary over time, and among models, it is difficult to assess their contributions clearly from Fig. 11. To provide a clearer picture, Fig. 12 shows the effects of 10 per cent exogenous depreciations, first of the yen and then of the dollar.

Fig. 12 also compares the results of partial and whole-model simulations of exchange rate changes to show the extent to which macroeconomic feedbacks alter the current balance effects of exchange rate changes. The left-hand panels show the effects of a 10 per cent depreciation on the depreciating country's real net exports and nominal current accounts, based on partial simulations of each model's current account block, while the right-hand panels show the corresponding results from full-model simulations. The top half of the page shows the Japanese results of yen depreciation, while the bottom half shows the US effects of dollar depreciation.

For Japan, all of the models show that net exports increase about twice as much in the partial simulations as they do in the full-model results. A similar result holds for the nominal current account balance, although here the reduction is rather less for the OECD than for the other models.

For the United States, all of the models show even greater differences between the partial and whole-model results than is the case for Japan. On average, the 10 per cent depreciation of the dollar improves the current account, in the third year, by $35 billion in the partial simulations, compared to $10 billion in the full model results. The macroeconomic offsets are greatest in EPA and rather modest in OECD, which shows substantially the largest full-model current balance effects of dollar depreciation.

Figure 12


PARTIAL VS FULL MODEL EFFECTS OF EXCHANGE RATES
100BY 10% YEN DEPREC, PARTIAL: REAL NET EXPORTS
100BY 10% YEN DEPREC, FULL: REAL NET EXPORTS
100BY 10% YEN DEPREC, PARTIAL: CURRENT BALANCE
100BY 10% YEN DEPREC, FULL: CURRENT BALANCE
B$ 10% $ DEPREC, PARTIAL: REAL NET EXPORTS
B$ 10% $ DEPREC, FULL: REAL NET EXPORTS
B$ 10% $ DEPREC, PARTIAL: CURRENT BALANCE
B$ 10% $ DEPREC, FULL: CURRENT BALANCE
EPA 88
MCM 88
OECD 88
1987
88
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92

The general conclusion from the evidence presented in this section is that while exchange rates do tend to move in response to fiscal expansion, these movements are not in themselves a very important part of the current account adjustment process that follows in the wake of changes in fiscal policy. The comparisons between the partial and full-model results of exchange rate changes show that the results do not come from small direct effects of exchange rates on trade flows, but from the macroeconomic repercussions that tend to cut absorption in the appreciating countries and increase inflation in the depreciating countries, thus offsetting the effects on the current balance.

5. Conclusions

This paper has had a double purpose: to compare the structures of three important multinational models, and to use their evidence, in conjunction with that from other models, to analyse the effects of Japanese and United States fiscal policies on their own and the other country's current balance. This conclusion draws these two strands together by summarizing what the three models have to say about the three questions presented at the beginning of the paper.

The experiments prepared for this symposium did not attempt to estimate the extent to which fiscal imbalances were responsible for international imbalances, although earlier research using these and other multinational models to determine the sources of the US current account deficit suggests[14] that divergent fiscal policies in the United States and the rest of the OECD were responsible for about two-thirds of the increase in the US deficit, with the additional appreciation of the dollar and other factors accounting for the rest. To what extent are these imbalances likely to be reversed by changes in fiscal policies? This paper has considered only changes in the United States and Japan.

Based on the evidence from the three models assessed in this paper, each \$50 billion reduction in US government spending is estimated to lead, by the third year, to a \$20 billion reduction in the US external deficit. A similar amount of extra spending in Japan would, by the third year, improve the US current balance by about \$4 billion.[15] Thus shifting \$50 billion of spending from the United States to Japan would

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[14] See especially the chapter by Helkie and Hooper in Bryant *et al.* (1988*b*).

[15] These results are from Table 4. Relative to the typical results quoted in the text, MCM shows effects of US fiscal policy that are about 25 per cent larger, and EPA shows effects of Japanese fiscal policy that are about half as great, with a third year effect on the US current account equal to \$2 billion for each \$50 billion spent in Japan.

improve the US current balance by $24 billion in the third year, about half of the amount of spending transferred. What about the effects on the Japanese current account?

Increasing Japanese government spending by 3,700 billion yen would, in the third year, reduce the Japanese current account surplus by about 700 billion yen. Reducing US spending by the same amount would reduce the Japanese current account surplus by an average of 800 billion yen.[16] Thus transferring 3,700 billion yen of spending (1 per cent of Japanese GNP) from the United States to Japan would reduce the Japanese current account surplus by about 1,500 billion yen, or about 40 per cent of the amount of spending transferred.

Combining this evidence, the models suggest that decreasing US government spending by $50 billion, with spending in Japan increased by the same amount, would, in the third year, reduce the US current account deficit by about $25 billion and reduce the Japanese external surplus by $20 billion.

The models are not uniform in their estimates, but they all agree in finding some asymmetry in the current balance effects of Japanese and US fiscal policies, even after account is taken of the differing sizes and trade patterns of the two countries. The main reason for this lies in the greater crowding out apparent in the US models, and the greater extent to which the crowding out of domestic GNP effects is in favour of imported goods and services. This asymmetry grows with time, so that the third-year results reported above for US fiscal contraction would show less improvement in the US balance of payments if reported for the second year, and more if reported for the fourth and subsequent years. The implication of this for policy is that while there may be substantial linkages from fiscal policies to current balances, they accumulate with time, and cannot be expected to have dramatic effects in the short term. Viewed from the perspective of the early 1980s, the inference is that the differential fiscal stances of the United States and the rest of the OECD might have been anticipated to lead eventually to the current account results of the late 1980s.

Finally, what about the role of exchange rates in the fiscal transmission process? This was the subject of §4, where it was shown that exchange rates do tend to move during the adjustment process, generally so as to appreciate the currency of the fiscally expanding country.

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[16] These results are from Table 5. There is less unanimity among the models in their estimates of the effects of fiscal policies on the Japanese current balance. All three models suggest, however, that US and Japanese fiscal policies have similar effects on the Japanese current balance. MCM and EPA show rather similar results, while OECD shows effects that are roughly half as big as for the other models.

However, these exchange rate movements do not contribute a very large part of the power of the expenditure switching process. In particular, the comparisons between the partial and the full-model results of exchange rate changes show that macroeconomic repercussions, which tend to reduce absorption and inflation in the appreciating countries and to increase them in the depreciating countries, act to truncate the substantial direct effects of exchange rates on trade flows.[17]

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[17] In his comments on the paper, Gerry Holtham noted that none of the three models surveyed for this conference involve model-consistent expectations of future interest rates and exchange rates, and suggested that consistent expectations would be likely to increase the exchange-rate effects of fiscal policy. This issue has been addressed in a subsequent paper (Helliwell *et al.* 1988), which compares the results of adaptive and model-consistent expectations in a G7 version of MULTIMOD (Masson *et al.* (1988) describes the IMF's G3 model on which the G7 version is based.) Over the first three years of US fiscal expansion, the consistent expectations version does show about four times as much dollar appreciation, on average, as the adaptive expectations version, but the current account effects are only about 15 per cent greater, for the reasons discussed in the text.