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Economic policies of the G3

Implications for international exchange rates

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Movements in major international exchange rates are of particular importance for Australian commodity exports because such changes will influence economic activity in the United States, Japan and Germany and can therefore impact on demand for Australian commodities. In addition, the majority of Australia's contracts for commodities are in US dollar terms.

Changes to fiscal and monetary policies in the United States, Japan and Germany are likely to have accounted for a significant proportion of the movements in international exchange rates in recent years. The possible impact of the US budget deficit reduction program, the implementation of Japan's announced fiscal packages, and German fiscal measures to comply with the Maastricht treaty requirements on the major international exchange rates are investigated in this paper.

ABARE project 1056

1. Introduction

The US dollar has depreciated sharply against the Japanese yen and, to a lesser extent, against the German deutschmark in recent years, reaching a record low in early 1995 before rising slightly in mid-1995. Movements in international exchange rates are of particular importance for Australian commodity exports because such changes will influence economic activity in the United States, Japan and Germany and can, therefore, impact on demand for Australian commodities. In addition, movements in the US dollar are also important as the majority of Australia's contracts for commodities are in US dollar terms. The sharp depreciation of the US dollar in recent years and the subsequent appreciation since mid-1995 means that an assessment of the short and longer term prospects for the US dollar is now essential.

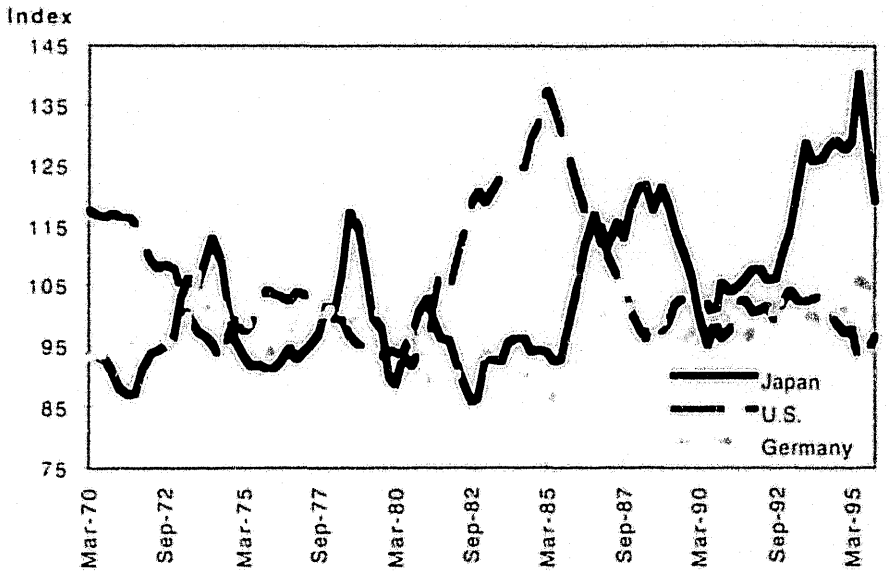
The main purpose in this paper is to examine the impact of likely economic policy changes in the United States, Japan and Germany on the US dollar, the yen and the deutschmark over the remainder of the 1990s. The results of this investigation may be useful to improve ABARE's assessments of exchange rates and economic conditions in the United States, Japan and Germany in the short and longer term.

The remainder of the paper is set out as follows. In section 2, developments in the international exchange rates over the past few decades are outlined. In section 3, we discuss the various factors which can influence real exchange rates and review recent developments in these factors in the United States, Japan and Germany. The modelling framework used in this research is described in section 4 and the results from shocks consistent with possible developments in key factors are presented. Concluding points are then discussed in section 5.

2. Recent developments in international exchange rates

After moving around a downward trend during the 1970s, the US real effective exchange rate (REER) — that is, the trade weighted nominal exchange rate adjusted for the trade weighted differential between the inflation rate in the United States and its major trading partners — rose sharply by around 42 per cent in the mid-1980s (figure 1). After a downward adjustment of around 26 per cent in the late 1980s, the US REER has moved around a relatively flat trend in recent years and is currently around 18 per cent lower than its level of the early 1970s.

Figure 1: Real effective exchange rates

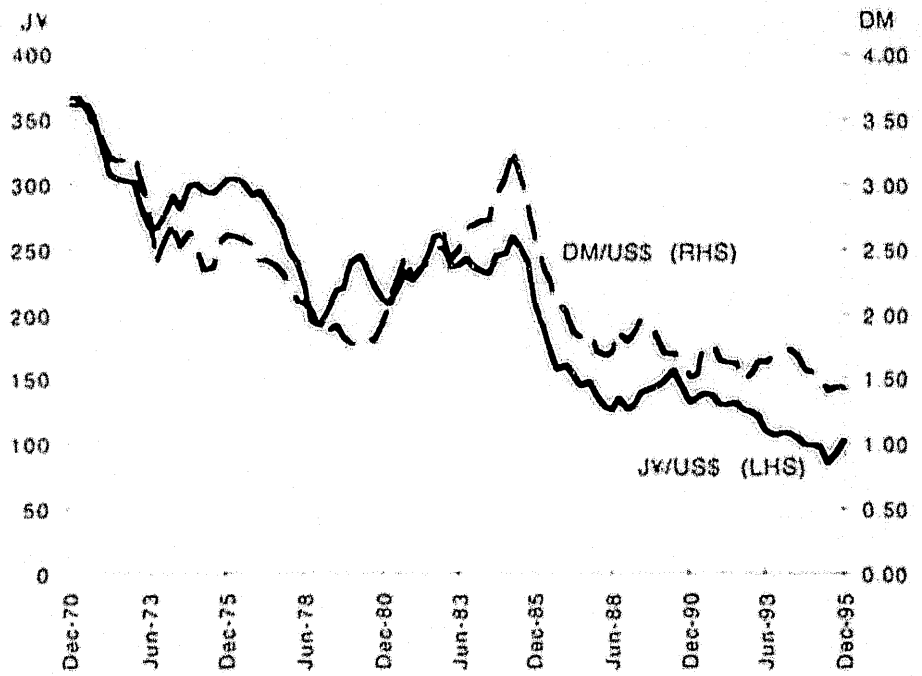


In contrast, the REER of Japan moved about a flat trend during the 1970s before appreciating gradually in the late 1980s. In recent years, Japan's REER has continued to strengthen following a sharp drop in 1990. As a result, Japan's REER is currently around 39 per cent higher than its level of the early 1970s. Germany's REER has moved sharply about an upward trend throughout the past few decades and is currently around 13 per cent higher than its level of the early 1970s. In nominal terms, the yen and the deutschmark have appreciated by around 77 per cent and 62 per cent respectively against the US dollar since the early 1970s (figure 2).

3. The influence of changes in economic policy

While many factors contribute to day to day movements, key changes to economic policies in the United States, Japan and Germany are likely to account for a significant proportion of the longer term movements in international exchange rates. In particular, changes in fiscal and monetary policies in these countries could contribute to the significant movements in the exchange rates of these economies in recent years.

Figure 2: US dollar exchange rates



Developments in fiscal and monetary policies are likely to continue to have an influence on the US dollar, the yen and the deutschmark over the remainder of the 1990s. Other factors which have been found to have an influence on real exchange rates in the longer term include a long term change in the productivity growth of economy and a reduction in barriers to trade between countries (Hsieh 1982; Marston 1987; Bergstrand 1991; Bell, Bartley and Sterland 1993). The relocation of labour intensive industries in the OECD to developing regions such as the Asian economies may also contribute to movements in real exchange rates over the longer term.

However, the focus in this paper is on the influence of changes in economic policies in the United States, Japan and Germany over the medium and longer term, and, so, these other possible influences are not discussed.

3.1 Fiscal policy

Loose fiscal policy will, in the short term, increase domestic demand for capital and reduce domestic savings. This will place upward pressure on domestic interest rates relative to those in other countries, and the exchange rate will appreciate. In the longer term, an

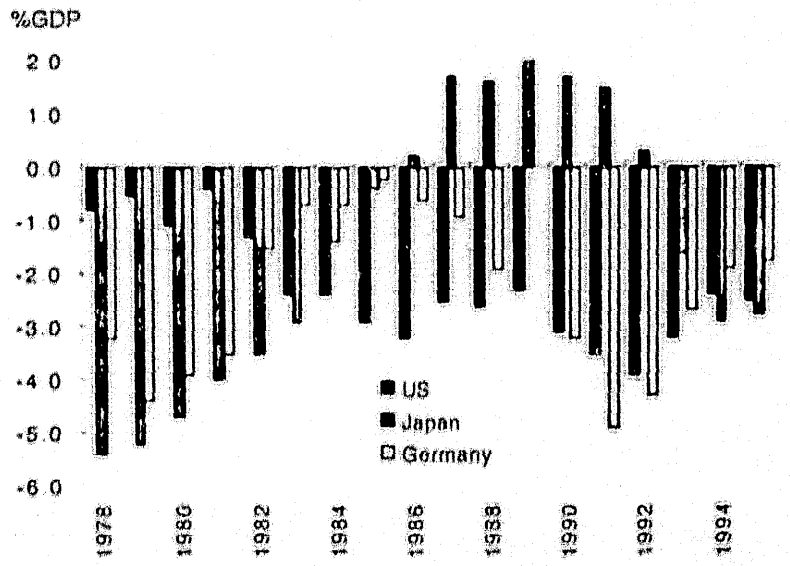
expansion of fiscal policy will increase demand for goods and services in the economy, leading to a rise in imports and a deterioration in the current account (Hutchinson and Pigott 1987).

A deterioration in the current account can in turn influence the exchange rate in two ways. First, the direct impact of a change in absorption (private and public consumption and investment) relative to GDP, observed via changes in the trade deficit relative to GDP, is to shift the real exchange rate in the same direction. A deterioration in the trade deficit relative to GDP will be associated with increased demand for non-traded goods in the economy which will lead to a rise in the price of non-traded goods relative to traded goods — that is, a rise in the real exchange rate (Salter 1959). However, the current account balance can also influence the exchange rate through expectations. For example, if there is an expectation of a future deterioration in the current account deficit, financial markets may factor a risk premium into the value of the country's currency, placing downward pressure on the exchange rate.

Fiscal policy in the United States

Fiscal policy in the United States was loosened substantially in the mid-1980s and early 1990s (figure 3). The structural budget deficit (that is, the actual budget less the effects of

Figure 3 Structural budget balance



cyclical deviations of output from potential output) rose from 0.4 per cent of GDP in 1981 to 3.9 per cent of GDP when the US economy was in recession in 1992 (OECD 1995). Reinhart (1991) found that the fiscal expansion in the United States in the mid-1980s contributed to the sharp real appreciation of the US dollar at that time. In recent years, strong private sector growth and the Clinton administration's initial deficit reduction package (the 1993 *Omnibus Budget Reconciliation Act*) have resulted in a reduction in the US budget deficit to around 2.5 per cent of GDP in 1994 and 1995 (OECD 1995).

Over the medium term, the US Congress is planning to further reduce the budget deficit to achieve a surplus by 2002. The Congress plan involves a series of spending cuts amounting to $900 billion over the seven year period from 1996, which will more than offset the impact of proposed income tax cuts of $245 billion (Congressional Quarterly Weekly Report 1995). The majority of the reduction in the budget deficit is planned to originate from cuts to spending on health and education programs.

While the details of the plan and the timing of the spending and tax changes have not yet been finalised, it is likely that less than one-third of the spending cuts would occur before 2000 (The Economist 1995). Given that the details of the plan have not, as yet, been agreed between the US President and Congress, some change to the final estimates is possible — in particular, the income tax cuts eventually agreed on could be less than the $245 billion currently proposed.

Fiscal policy in Japan

In Japan, fiscal policy was gradually tightened over the 1980s, with the structural budget balance falling from a deficit of 5.4 per cent of GDP in the late 1970s to a surplus of 2.0 per cent of GDP in the late 1980s. In recent years, however, a prolonged period of economic weakness and repeated government attempts to stimulate demand have pushed the structural budget deficit to around 2.8 per cent of GDP in 1995 (OECD 1995).

The Japanese government has introduced six separate fiscal stimulus packages, amounting to around ¥62 trillion, or 13 per cent of GDP, since mid-1992 (table 1). The first two packages, announced in August 1992 and April 1993, focused mainly on public works, but also attempted to stimulate private investment through increased provision of loans. The third package, announced in September 1993, strengthened the loans programs to the private sector with an increased emphasis on improving conditions in the housing market. The fourth and largest package, announced in February 1994, was designed to give a substantial boost to domestic demand through income tax cuts, assistance to small and

Table 1: **Japan's recent economic stimulus packages**

Date of announcement	¥ trillion	% of GDP
August 1992	10.7	2.3
April 1993	13.2	2.8
September 1993	6.2	1.3
February 1994	15.3	3.2
April 1995	2.1	0.4
September 1995	14.2	3.0

medium sized firms, and also involved substantial land purchases. The latest two packages announced in April and September 1995, focused mainly on increasing general public investment, further land purchases and on reconstruction following the Hyogo earthquake. The damage from the Hyogo earthquake is estimated to have been around ¥10 trillion, or 0.8 per cent of Japan's capital stock (OECD 1995, p. 50).

Over the medium term, Japanese fiscal policy is expected to be tightened gradually (Ministry of Finance 1995). In line with this, the Japanese government has announced that the income tax cuts introduced in the February 1994 fiscal package will cease in fiscal year 1997. In addition, the consumption tax rate will be increased by 2 percentage points to 5 per cent at that time (Ministry of Finance 1994). However, on the expenditure side, the government announced in late 1994, a ten year public investment plan of ¥630 trillion over the period from fiscal year 1995 to fiscal year 2004 (Ministry of Finance 1995). The aim of this program is to increase public investment spending from its current level, and the average level of the 1980s, of around 8 per cent of GDP, to around 9.25 to 9.5 per cent of GDP.

Fiscal policy in Germany

In Germany, fiscal policy expanded following the reunification of east and western Germany in 1990. In order to restore fiscal stability, Germany has implemented, over the past five years, deficit reduction measures that have averaged over 1 per cent of GDP a year. As a result, the German structural budget deficit has eased from 4.9 per cent of GDP in 1991 to around 1.8 per cent of GDP in 1995 (OECD 1995).

In the short term, German fiscal policy is expected to become slightly stimulatory as a result of substantial income tax cuts which are unlikely to be offset by the German government's deficit reduction measures. A ruling of the German constitutional court requires the government to introduce an annual tax-free threshold for low income earners of DM12095

per person from January 1996 (German Institute for Economic Research 1995). The measure is expected to reduce government revenue by around DM19 billion a year.

A reduction of the budget deficit toward pre-unification levels is expected to occur in Germany over the remainder of the 1990s (IMF 1995). Under the Maastricht treaty, the level of general government debt must be reduced to 60 per cent of GDP (IMF 1995, p. 29). Gross government debt is estimated to be around 58 per cent of GDP in 1995 (OECD 1995). In line with this, the German government has announced plans to reduce government outlays from the current level of 49 per cent of GDP, back to the pre-unification level of 46 per cent of GDP by 2000.

3.2 Monetary policy

A monetary expansion will, in the short term, lower domestic interest rates relative to those in other countries. Net capital inflow will decrease, placing downward pressure on the exchange rate. The exchange rate will depreciate and 'overshoot' downward until the expected recovery in the exchange rate is sufficient to compensate investors for the lower interest rate. In other words, a monetary expansion, or a reduction in domestic interest rates relative to those overseas, will result in a depreciation of the real exchange rate in the short term, other factors unchanged. In the longer term, monetary policy is widely seen to be neutral with respect to real variables (such as the real exchange rate) because the effects of changes in monetary policy are eventually offset by a permanent change in the price level (Dornbusch 1976).

The United States tightened monetary policy following the 1991 recession in order to avoid any significant increase in inflationary pressures as the economy strengthened. In recent months, US monetary policy has been eased as evidence has emerged of a slowing in economic growth and moderating price pressures (JP Morgan 1995, p. 28). The economic recovery in Japan and Germany has lagged that of the United States and, hence, Japan and Germany have continued to ease monetary policy in recent years.

The United States and Japan do not set explicit long term targets for monetary supply or inflation. However, both countries generally aim for low and stable inflation rates and in the case of the United States, the Federal Reserve Bank tightened monetary policy in the early 1990s when there was evidence of inflation rising above 2–3 per cent. In contrast, the German Bundesbank has an announced inflation target of 0–2 per cent and adjusts official interest rates in order to maintain inflation within this range (IMF 1995).

4. Modelling framework and analysis

In this paper, a dynamic macroeconomic model of a multiregion world economy, developed by McKibbon and Sachs (1991), is used for the policy simulations. The MSG model (McKibbon Sachs Global model) solves for a full intertemporal equilibrium in which agents have rational expectations and foresight of future variables. That is, the model is able to account for the long run effects of short run policy changes. This is a particularly useful feature when evaluating the impact of likely changes in economic policies on exchange rates. The model calibration process uses a 1992 base with data updated to 1994. This means that the impact of any policies announced in 1994 or earlier may already be included in the model data set.

The basic theoretical framework of interdependence between international economies used in the MSG model is that developed by Mundell (1963) and Fleming (1962). However, the basic Mundell-Fleming model has been extended to allow for dynamic effects of policies, such as the long run effects on trade deficits of a fiscal contraction. The MSG model also includes price and wage dynamics, allowing for output and exchange rate changes to feed back into the economy (McKibbon and Sachs 1991).

In the model, it is assumed that each country produces one tradable good that is an imperfect substitute for every other country's tradable good. Real exchange rates are defined as the relative price of domestic to foreign goods, such that when the real exchange rate depreciates, foreign goods become more expensive relative to the domestic good. A real exchange rate depreciation therefore causes a shift away from foreign goods toward domestic goods, thereby boosting aggregate domestic demand. Capital is perfectly mobile in the model and movements in current exchange rates are determined by changes in expected future interest rate differentials and the long run real exchange rate. With rational expectations, expected changes in future policies can affect the current exchange rate, although the effect is smaller the farther off in the future the anticipated change in policy is thought to be (McKibbon and Sachs 1991). The government budgetary account is time-consistent in that present budget deficits must be offset by future discounted budget surpluses.

Simulations of recent fiscal and monetary policies introduced in the US, Japanese and German economies and planned future policy changes were undertaken and the possible influences on the US dollar, the yen and the deutschmark were examined. Developments in fiscal and monetary policies in the United States, Japan and Germany were analysed

directly by considering recently announced changes in government spending and taxes (relative to GDP) and actual recent movements in official interest rates in these economies. The results from these simulations are discussed below and reported in detail in tables 2–4.

4.1 The impact of the US budget deficit reduction program and recent monetary policy changes

While the stance of fiscal policy has remained relatively unchanged in the United States in 1995, with the structural budget deficit remaining around 2.5 per cent of GDP and general government outlays constant at 33.5 per cent of GDP (OECD 1995), the direction of monetary policy has changed. The US Federal Reserve Bank significantly tightened monetary policy in early 1995 before easing slightly later in the year. As a result, the US federal funds rate was around 1.5 percentage points higher at the end of 1995 than a year earlier. This was modelled in MSG as a reduction in the money supply in 1995.

A proposal before the US government to reduce its budget deficit to achieve a surplus by 2002 was announced in detail in 1995. This was modelled as a contraction in US government consumption over the seven year period from 1996. Account was taken that around two-thirds of the cuts to government spending are not expected to occur until after 2000 (The Economist 1995). In this modelling simulation, government consumption was reduced by $75 billion a year over the four years from 1996 to 1999 and by a further $200 billion a year from 2000 to 2002. The planned decrease in income taxes was modelled as a change in household income taxes equivalent to $245 billion over the period from 1996 to 2002.

The model results suggest that given developments in monetary and fiscal policy in 1995, if the US government does succeed in reducing its budget deficit over the medium term as announced, then the decrease in government demand and the decline in government borrowing would lead to an immediate decrease in domestic demand and a fall in interest rates in the United States (table 2). US GDP could be around 0.2 per cent lower in the short term than would otherwise be the case, but rise in the longer term in response to lower real interest rates and a lower real exchange rate (figures 4 and 5). US GDP gradually stabilises over the longer term at around 1 per cent higher as a result of the fiscal package.

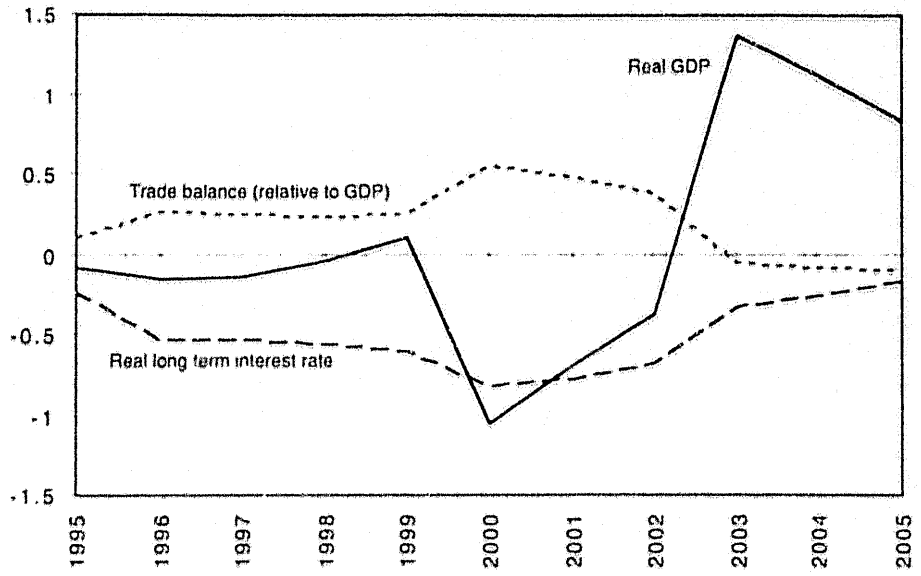
The decline in demand leads to a small improvement of around 0.3 per cent of GDP in the US trade balance in the short term and slightly larger improvement of 0.6 per cent of GDP in the medium term. The lower real interest rates and reduction in government borrowing

Table 2: US fiscal and monetary policy simulation results

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Real GDP a	–0.08	–0.15	–0.14	–0.03	0.10	–1.05	–0.69	–0.36	1.37	1.13	0.83
Inflation b	0.05	0.26	0.20	0.24	0.42	–0.46	–0.81	–1.14	–0.15	0.15	0.26
Private investment a	–0.13	0.04	0.02	0.05	0.12	0.17	0.26	0.31	0.35	0.30	0.23
Private consumption a	–0.13	0.38	0.34	0.36	0.33	0.03	0.22	0.51	0.84	0.78	0.65
Real long term interest rate b	–0.24	–0.52	–0.54	–0.56	–0.61	–0.82	–0.78	–0.67	–0.32	–0.25	–0.17
Trade balance a	0.11	0.26	0.26	0.25	0.26	0.55	0.49	0.39	–0.06	–0.08	–0.09
Real effective US$ c	–0.99	–2.70	–2.40	–2.35	–2.70	–4.19	–3.85	–3.10	–0.85	–0.51	–0.07
Real effective J¥ c	0.86	1.51	1.29	1.22	1.91	1.98	1.72	0.66	0.22	0.17	0.00
Real effective DM c	0.36	0.46	0.45	0.45	0.54	0.70	0.64	0.45	0.14	0.06	0.01
US$/¥ c	1.35	3.33	3.20	3.38	4.22	5.18	4.01	2.03	–0.33	–0.54	–0.78
US$/DM c	1.41	3.33	3.22	3.44	4.15	5.33	4.10	2.24	–0.38	–0.57	–0.76

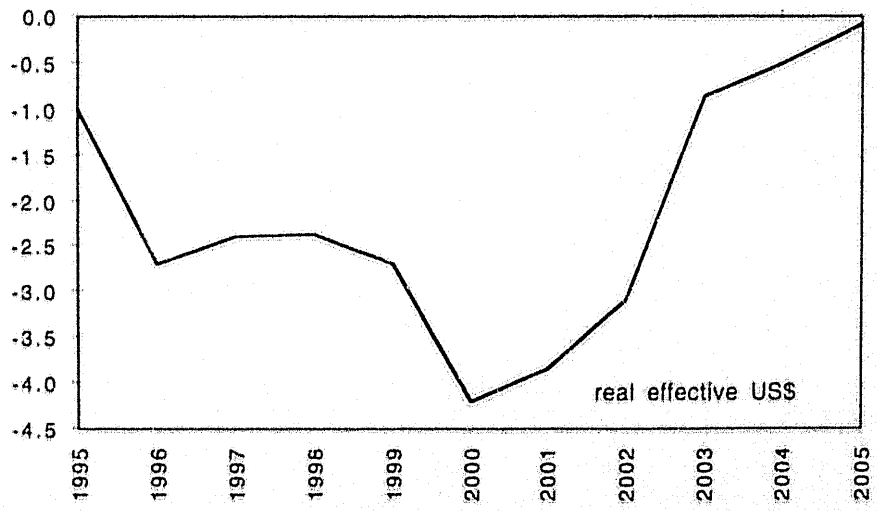
a Deviation from the baseline as a percentage of GDP. b Absolute deviation from the baseline. c Percentage deviation from the baseline

Figure 4: **US fiscal and monetary policy simulation** (% deviation from baseline)



result in lower capital inflows which depreciate the real value of the US dollar. The US REER declines by around 1.0 per cent immediately and continues to depreciate over the medium term (figure 5). As the impact of the spending cuts falls relative to GDP, the REER would gradually rise to be around 3.1 per cent lower than would otherwise be the case in 2002 and largely unchanged in the longer term.

Figure 5: **US fiscal and monetary policy simulation** (% deviation from base)



The impact of the US budget deficit reduction program on GDP in other economies is positive but largely insignificant, with output growth in both Japan and Germany increasing only slightly over the seven year period. The initial reduction in US GDP dampens growth in GDP in other economies in the short term. However, in the medium and longer term, given the importance of the US economy in world capital markets, the reduced inflow of capital into the United States contributes to a global reduction in interest rates which strengthens world growth. Hence, the timing of the change in fiscal policy would be crucial for the magnitude of the transmission of this policy to other countries. This is because of the timing of the decrease in interest rates in the rest of the world (as a result of a fall in capital inflow requirements to the United States) and the effects on world output of the adjustment path of US economic growth.

US inflation rises slightly (by less than 0.5 percentage points) in the short term due to an increase in import prices reflecting the depreciation of the US dollar, before falling over the medium term. These results for inflation depend, of course, on the relative timing of the proposed income tax and spending cuts. For example, a cut in income taxes and the associated rise in domestic demand would, in the model, only begin to translate into a rise in inflation after several years. Inflation initially falls due to lower import prices associated with an appreciation in the real exchange rate (McKibbon 1993). Similarly, the reduction in inflation associated with a cut in government spending would be delayed by several years after the spending cut. Hence, if the proposed US income tax cuts were to be largely introduced early in the deficit reduction program and the spending cuts were delayed until toward the end of the program, then some upward pressure on inflation could result after several years into the program.

4.2 The impact of Japan's fiscal packages and monetary policy changes

As discussed in section 3, both monetary and fiscal policy in Japan have been eased in 1995 in an attempt to stimulate private sector activity. Monetary policy in Japan was eased throughout 1995, such that the official discount rate was around 1.25 percentage points lower at the end of 1995 than a year earlier. The impact of this reduction was modelled as a change in the Japanese money supply.

The cessation in 1997 of income tax cuts introduced in 1994 and extended in 1995, and a rise in the consumption tax rate in 1997 are also likely to have some impact on the value of the yen. These tax changes were modelled as a decline in household income taxes, equivalent to 1.3 per cent of GDP, in 1995 and 1996 and a rise of 2 percentage points in

the value added tax rate in 1997. The April 1995 fiscal package and ¥2.1 trillion of the September package (Salomon Brothers 1995) were largely in response to the Hyogo earthquake. It is assumed that the impact on the Japanese economy of the earthquake will be offset by the measures contained in these packages and by the response of the private sector to the increased demand for capital for reconstruction. The remaining expenditure measures in the September 1995 fiscal package are modelled in the MSG model as an increase in government investment relative to GDP. It is assumed that the increase in government spending is spread evenly over the remainder of 1995-96 and 1996-97 fiscal years. The results for the combined simulation of the tax changes and government investment increase for Japan are reported in table 3

With an easing of monetary and fiscal policy in 1995, the real value of the yen falls by 0.9 per cent in 1995 before rising in 1996 due to an increase in real interest rates, as the private sector anticipates the announced rise in the consumption tax rate in 1997. Once the income tax cuts and the government spending stimulus cease in 1997, the real value of the yen declines. In the longer term, the model results suggest that the yen would remain around 4.7 per cent lower in real terms, than would otherwise be the case (figure 6).

While the increase in government spending leads to a rise in real short term interest rates in the short term which reduces private sector investment, Japanese GDP rises by 0.2 percentage points initially with higher government spending and private consumption. In the longer term, GDP returns to around the level it would otherwise have been.

Figure 6: **Japanese fiscal and monetary policy simulation** (% deviation from base)

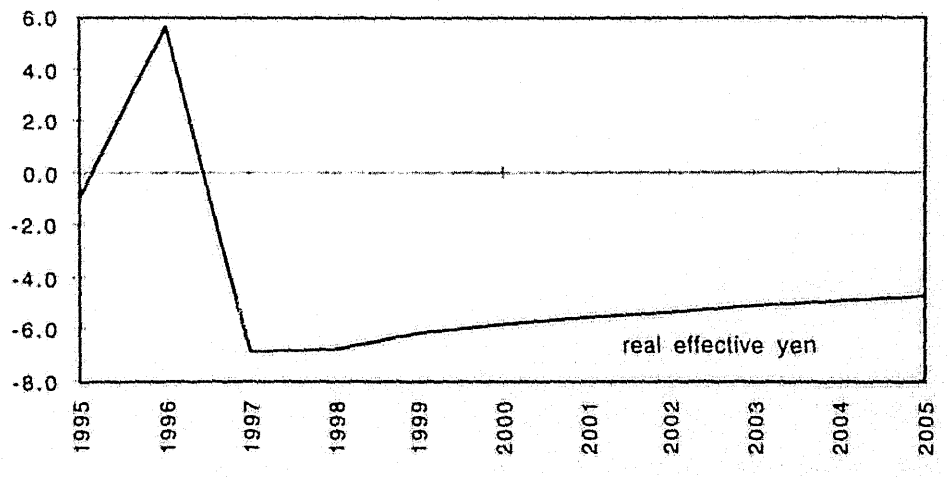


Table 3: **Japan fiscal and monetary policy simulation results**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Real GDP a	0.22	–0.01	–0.08	–0.04	–0.01	0.01	0.03	0.04	0.06	0.07	0.08
Inflation b	0.21	4.11	–1.42	–0.22	0.01	–0.02	–0.03	–0.04	–0.04	–0.04	–0.05
Private investment a	–0.38	–1.23	0.13	0.20	0.19	0.18	0.18	0.18	0.18	0.18	0.19
Private consumption a	0.30	1.57	–1.63	–1.67	–1.63	–1.58	–1.53	–1.47	–1.41	–1.35	–1.28
Real long term interest rate b	0.36	1.00	–0.29	–0.36	–0.35	–0.34	–0.34	–0.34	–0.34	–0.35	–0.35
Trade balance a	0.08	–0.93	1.06	1.12	1.06	1.01	0.98	0.94	0.90	0.87	0.83
Real effective US$ c	–0.09	–0.58	1.12	1.14	0.99	0.89	0.84	0.81	0.79	0.77	0.74
Real effective J¥ c	–0.88	5.66	–6.85	–6.79	–6.16	–5.78	–5.52	–5.31	–5.12	–4.92	–4.71
Real effective DM c	0.12	0.08	0.43	0.48	0.46	0.42	0.38	0.36	0.35	0.35	0.36
US$/¥ c	–0.91	0.82	–7.37	–7.25	–6.74	–6.39	–6.12	–5.88	–5.65	–5.42	–5.18

a Deviation from the baseline as a percentage of GDP. b Absolute deviation from the baseline. c Percentage deviation from the baseline.

The model results suggest that inflation in Japan could rise in the short term as a result of the monetary and fiscal policy changes. However, this is a once-off increase which is reversed in the following year and there is no significant impact on inflation in the longer term from the fiscal policy changes.

If the Japanese government continues to expand government investment over the medium term, according to its announced public investment plan for the period from fiscal year 1995 to fiscal year 2004, then some upward pressure on the value of the yen could remain. While very little is known about the timing of measures to be introduced under this plan, if the level of public investment spending rises from its current level of 8 per cent of GDP to average around 9.25 per cent of GDP over the period from 1995 to 2004, then the real value of the yen could be up to 40 per cent higher in the long term than would otherwise be the case.

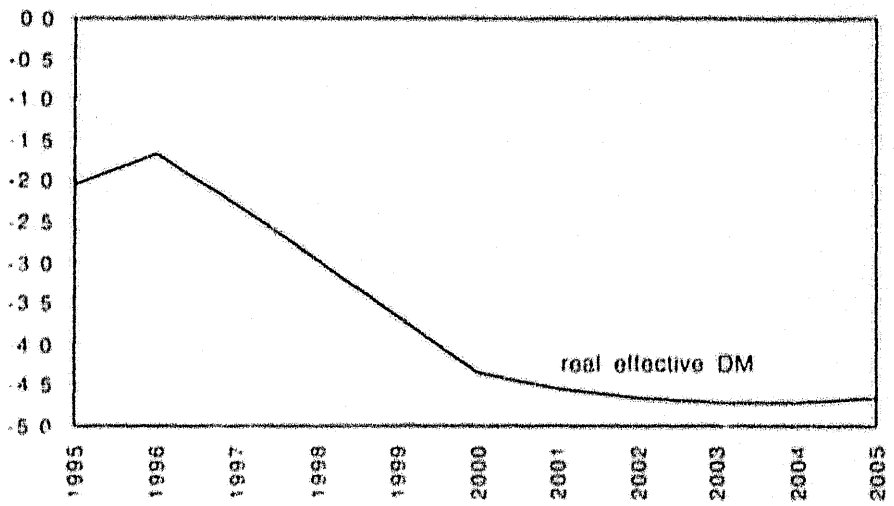
4.3 The impact of German fiscal and monetary policy changes

As in the case of the United States, the stance of fiscal policy in Germany has remained relatively unchanged in 1995, with the structural budget deficit remaining around 1.8 per cent of GDP and general government outlays constant at 49 per cent of GDP (OECD 1995). However, the Bundesbank significantly eased monetary policy throughout 1995, with the discount rate around 1.0 percentage points lower at the end of 1995 than a year earlier. This was modelled in MSG as an increase in the money supply in 1995.

In 1996, German fiscal policy is expected to become slightly stimulatory as a result of substantial income tax cuts which are unlikely to be fully offset by the German government's deficit reduction measures. The introduction of an annual tax-free threshold of DM12095 per person from January 1996 was modelled in MSG as a permanent reduction in the household tax rate. The reduction in the tax rate consistent with the expected decline in government revenue of DM19 billion a year is estimated to be around 1 percentage point. Over the medium term, the German government has announced plans to reduce government outlays from the current level of 49 per cent of GDP, back to the pre-unification level of 46 per cent of GDP by 2000. This was modelled as a reduction in government spending equivalent to 3 per cent of GDP over the period from 1995 to 2000.

An easing in monetary policy in 1995, combined with the announced fiscal policy measures, would result in an immediate decline in the real value of the deutschmark of around 2.0 per cent (figure 7). While the reduced household tax rate would raise domestic

Figure 7 German fiscal and monetary policy simulation (% deviation from base)



demand and real interest rates and hence increase the real value of the deutschmark (refer to McKibbon 1993), this is more than offset by the negative impact on the deutschmark of the monetary policy easing and the government spending reductions. Over the longer term, the real value of the deutschmark would continue to decline to be around 4.7 per cent lower than would otherwise be the case.

Given the increase in domestic demand following the income tax cuts, GDP in Germany would initially strengthen before declining over the medium term in response to higher real interest rates and lower government demand (table 4, figure 8). In the longer term, the model results indicate that German economic growth would stabilise around 0.2 percentage points lower than would otherwise be the case. German inflation is likely to increase by less than 1 percentage point in the short term as a result of the changes in monetary and fiscal policy and, hence, is not likely to necessitate a tightening of monetary policy to maintain inflation within the Bundesbank's target range of 0 to 2 per cent.

4.4 The impact of combined G3 economic policies

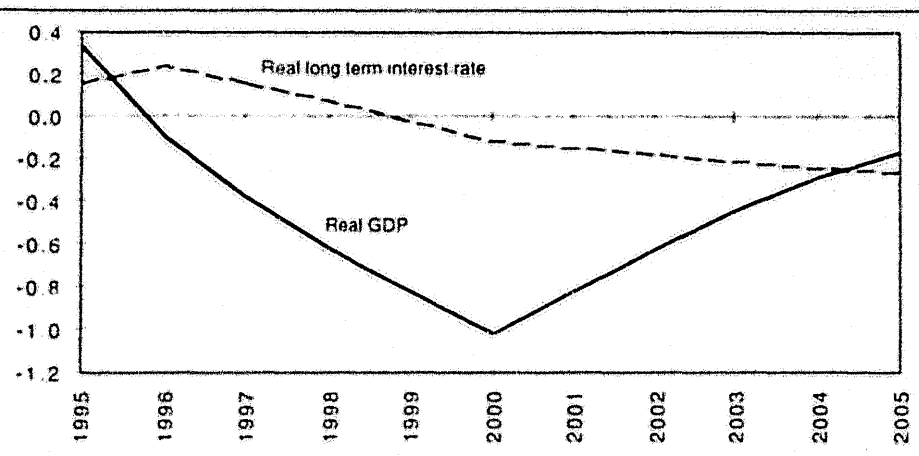
The combined effect on international exchange rates of changes in fiscal and monetary policy in the United States, Japan and Germany is of considerable interest as a country's exchange rates are influenced not only by developments within their own economy, but also by developments in that country's major trading partners. The impact on the real

Table 4: German simulation and combined G3 simulation results

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
German fiscal and monetary policy simulation results											
Real GDP a	0.34	-0.09	-0.38	-0.62	-0.82	-1.02	-0.82	-0.62	-0.44	-0.29	-0.17
Inflation b	0.60	0.38	0.37	0.31	0.18	-0.04	-0.12	-0.17	-0.18	-0.17	-0.15
Private investment a	-0.08	-0.27	-0.29	-0.28	-0.26	-0.24	-0.20	-0.15	-0.11	-0.06	-0.03
Private consumption a	0.08	0.38	0.25	0.15	0.07	-0.03	0.08	0.21	0.35	0.48	0.61
Real long term interest rate b	0.15	0.25	0.16	0.07	-0.03	-0.12	-0.15	-0.18	-0.21	-0.24	-0.27
Trade balance a	0.69	0.59	0.86	1.12	1.38	1.64	1.64	1.63	1.61	1.58	1.54
Real effective US$ c	1.13	0.80	0.83	0.89	0.95	1.00	0.95	0.95	0.97	0.98	0.99
Real effective JY c	0.90	0.77	0.82	0.87	0.92	0.95	0.94	0.94	0.95	0.96	0.96
Real effective DM c	-2.03	-1.66	-2.31	-2.99	-3.67	-4.34	-4.54	-4.66	-4.71	-4.70	-4.65
US$/DM c	-4.43	-3.69	-4.59	-5.43	-6.15	-6.63	-6.48	-6.38	-6.27	-6.15	-6.00
Combined G3 simulation results											
Real US GDP a	0.01	-0.05	-0.19	0.07	0.32	-0.78	-0.40	-0.09	1.62	1.35	1.04
Real Japanese GDP a	0.36	0.00	-0.06	-0.02	0.02	0.05	0.09	0.12	0.15	0.17	0.18
Real German GDP a	0.64	-0.19	-0.31	-0.40	-0.41	-0.83	-0.58	-0.48	-0.01	0.04	0.07
Real effective US$ c	0.04	-2.48	-0.45	-0.33	-0.76	-2.29	-2.06	-1.34	0.90	1.24	1.66
Real effective JY c	0.88	7.94	-4.74	-4.71	-3.33	-2.85	-2.86	-3.71	-3.94	-3.79	-3.75
Real effective DM c	-1.55	-1.12	-1.44	-2.06	-2.67	-3.23	-3.52	-3.86	-4.22	-4.29	-4.28
US$/JY c	0.66	4.39	-3.93	-3.64	-2.30	-1.00	-1.90	-3.64	-5.78	-5.77	-5.78
US$/DM c	-2.58	-0.13	-0.70	-1.29	-1.32	-0.63	-1.73	-3.49	-6.01	-6.08	-6.12

a Deviation from the baseline as a percentage of GDP. b Absolute deviation from the baseline. c Percentage deviation from the baseline.

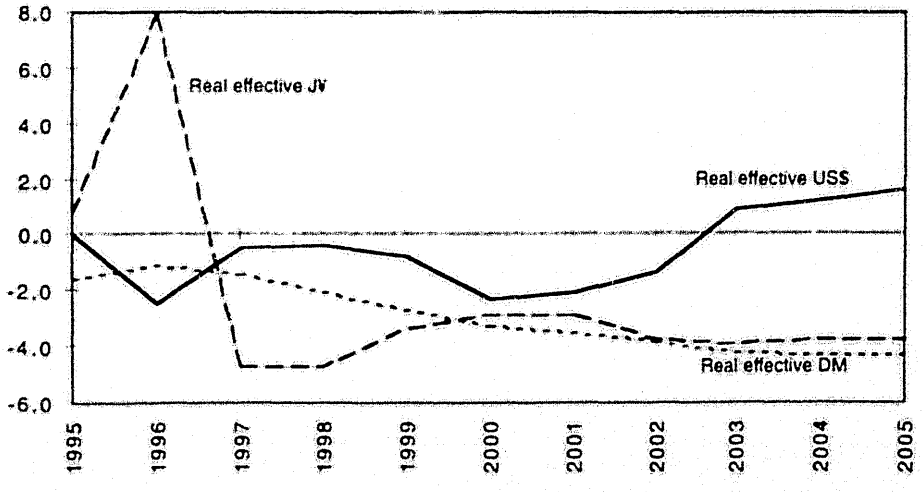
Figure 8: **German fiscal and monetary policy simulation** (% point deviation from base)



effective exchange rates of combined changes in fiscal and monetary policy is presented in figure 9.

Given the overwhelming magnitude of the change in the Japanese real exchange rate from the simulation of Japan's ten year government investment package and the lack of information on the timing of these measures, inclusion of this package in an overall analysis of policy changes in the United States, Japan and Germany could present a misleading picture of the timing of future changes in international exchange rates. Hence, analysis of

Figure 9: **Combined impact of fiscal and monetary policies** (% deviation from base)



the combined economic policies of the United States, Japan and Germany is undertaken excluding the effects of this package.

It is important to note that the simulation results are intended to be a broad indicator of direction of change of international real exchange rates as a result of economic policy changes over the medium and longer term. In any given year, factors other than monetary and fiscal policy, such as those discussed in section 3 and short term influences on exchange rates such as financial market concern about the timing and extent of changes in economic policies, could have an influence on the US dollar, yen and deutschmark.

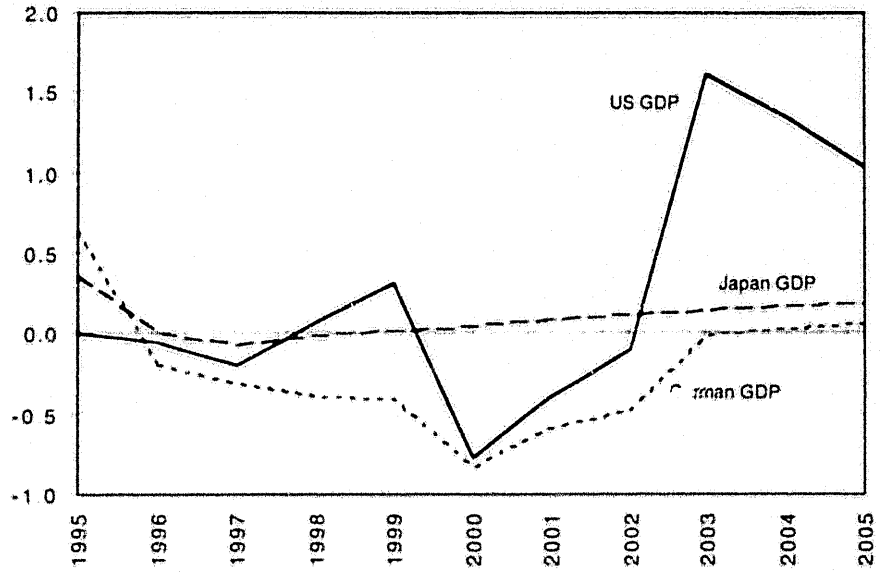
The model results indicate that in the short term, fiscal and monetary policy measures in the United States, Japan and Germany could result in a lower real value of the US dollar and deutschmark and a higher real value of the yen than would otherwise be the case. However, as the fiscal stimulus in Japan eases in the late 1990s, the real value of the yen is likely to decline. The US real exchange rate is likely to appreciate to be higher in the longer term than it would be in the absence of the fiscal policy changes. This rise in the real value of the US dollar reflects a decline in real interest rates in Japan and Germany relative to those in the US. The simulation results indicate that against the yen and the deutschmark, the US dollar could appreciate, in nominal terms, by around 6 per cent over the longer term.

For economic growth in the United States and Japan, the model results indicate that changes in monetary and fiscal policies are likely to reduce economic growth in these countries in the short term before strengthening in the longer term (figure 10). US economic growth could be up to 1.6 percentage points higher in the longer term as a result of the tightening of fiscal policy undertaken in the United States, Japan and Germany over the medium term. In Japan, economic growth in the longer term could be up to 0.2 percentage points higher as a result of the tightening of fiscal policy undertaken in the United States, Japan and Germany. In Germany, economic growth could decline by up to 0.8 percentage points over the medium term as a result of the tightening of fiscal policy undertaken in the United States, Japan and Germany but is likely to strengthen in the longer term to be slightly above the level it would otherwise have been.

5. Conclusion

This paper has examined, using a dynamic global macroeconomic model, the impact of recent fiscal and monetary policy changes on the US dollar, the yen and the deutschmark

Figure 10: **Combined impact of fiscal and monetary policies** (% point deviation from baseline)



and the likely influences of developments in these policies over the medium to longer term. Movements in international exchange rates are of particular importance for Australian commodity exports as such changes will influence economic activity in the United States, Japan and Germany and can therefore impact on demand for Australian commodities. In addition, movements in the US dollar are also important as the majority of Australia's contracts for commodities are in US dollar terms. The results of this investigation may be useful to enhance ABARE's assessments of exchange rates and economic conditions in the United States, Japan and Germany in the short and longer term, and hence, could lead to improved forecasts of demand for agricultural and resource commodities.

The analysis undertaken in the paper suggests that while the yen will initially remain higher in real terms than would be the case in the absence of fiscal and monetary policy changes, the US dollar and the deutschmark are likely to be lower than would otherwise be the case. Over the medium term, fiscal policy is likely to continue to be a key influence on movements in international exchange rates. The model results indicate that a tightening of fiscal policy over the medium term via a reduction in government spending in the United States and Germany and an increase in the consumption tax rate in Japan could result in lower real exchange rates for these economies. However, the US real exchange rate is likely to appreciate to be higher in the longer term than it would be in the absence of the fiscal policy changes.

When the policy change is phased in, as in the case of the planned US budget deficit reduction program, the timing of the change in fiscal policy is crucial for the magnitude of the transmission of this policy to other countries. This is because of the relative timing of the change in interest rates in the rest of the world and the effects on world output of a change in US output. In the case of the United States, the timing of the relative reductions in income taxes and government spending are crucial in the implication for inflation in the US economy. If the proposed US income tax cuts were introduced early in the deficit reduction program and the spending cuts were delayed until toward the end of the program, then some upward pressure on inflation could result over the medium term.

In Japan, announced tax and government spending changes are likely to be the key influences on the yen over the medium term. These fiscal measures are estimated to lower the real value of the yen over the medium to longer term. However, if the government continues to expand government investment according to its ten year plan, then some upward pressure on the real value of the yen could remain over the medium term. In Germany, an easing of monetary policy is likely to depreciate the deutschmark in real terms in the short term, more than offsetting upward pressure on the deutschmark arising from lower income taxes. Over the medium term, the real value of the deutschmark is likely to remain lower as a result of a tightening of fiscal policy through a reduction in government spending.

Overall, movements in international exchange rates are likely to be influenced substantially by changes in fiscal policy in the United States, Japan and Germany over the medium term. As the details of most of these policy changes have already been announced, the modelling of the impact on exchange rates can be undertaken. However, a useful extension of this research would be to expand this analysis to other economies which are a significant market for Australia's commodity exports, particularly the Asian economies. In such an analysis the impact on exchange rates of other factors such as changes in relative productivity growth, the movement of capital to developing economies and a reduction in trade barriers could become significant influences on international exchange rates.

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