TRYM PRELIMINARY PAPER

28 August 2003
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> **PLEASE NOTE:**
> This is a preliminary draft based on the results of simulations using the current
> version of TRYM. Updated versions of this note will be distributed as further
> progress is made with the redevelopment of the model and to incorporate feedback.

A PERMANENT FISCAL EXPANSION

Executive Summary

- This note examines the effects of a permanent balanced budget fiscal expansion. The note is intended as a background contribution to recent debate in the Department regarding the design of contingent fiscal measures that might be used to address a future economic downturn.

  - The effects of the shock are examined within the framework of a standard theoretical macroeconomic model. TRYM is used to flesh out the impacts and transmission mechanisms and to illustrate the dynamic paths of adjustment.

    : The version of TRYM used in this exercise includes a number of significant modifications that have emerged out of the ongoing model redevelopment project.

    : The effects of the permanent fiscal shock generated by TRYM are broadly in line with theoretical priors. In particular we see behaviour that is consistent with the rational expectations IS-LM-IP Dornbusch overshooting model.

- The results highlight the factors that propagate and reinforce a fiscal expansion in the short term - that is:

  - the balanced-budget multiplier effect;

  - the higher disposable income to consumption mechanism; and

  - the investment accelerator-multiplier.

- The results also illustrate the factors that bring the economy back to equilibrium in the longer run and that therefore counteract the expansion - that is:

  - crowding out due to higher interest rates;

  - crowding out due an appreciation of the exchange rate and lower net exports;

  - the tax effects on disposable income of a balanced budget assumption; and

  - adjustments in the labour market.

• The impact of a one per cent balanced-budget fiscal expansion using TRYM are summarised in Chart 1.

- GDP remains higher for around three years. While the government sector is around a quarter of GDP, the immediate impact of the one per cent shock is around 0.13 percentage points. This reflects the immediate crowding out due to higher interest rates, tax rates and exchange rates.

  : In the long run GDP is lower reflecting the switching of resources from the private to public sector.

- The unemployment rate is initially lower reflecting stronger government employment.

  : In the long run unemployment is unchanged. This is by definition given that labour supply and the participation rate are unaffected by a fiscal expansion.

- Prices are initially lower due to an exchange rate appreciation feeding through to lower import prices and lower domestic prices.

  : In the long run the level of prices are unchanged. This is by definition, reflecting the utilisation of a Taylor rule monetary policy reaction function.

Chart 1
GDP, Price of GNE and the Unemployment Rate
Deviations from Baseline

Years after shock
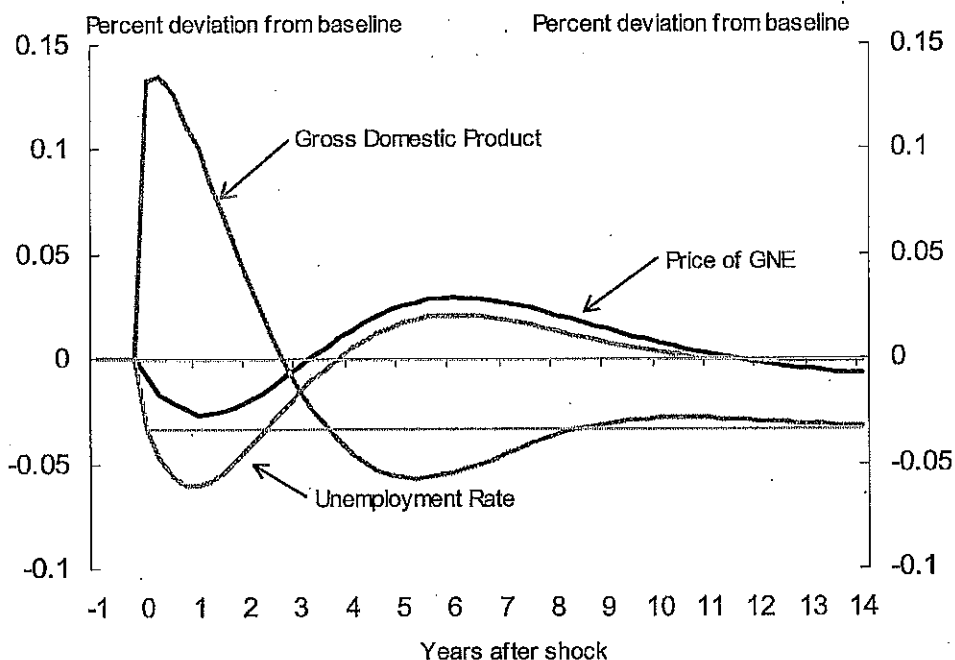
A PERMANENT FISCAL EXPANSION - DETAILS

1. Introduction

This note examines the effects of a permanent balanced-budget fiscal expansion. The note is intended to contribute to recent debate in the Department regarding the design of contingent fiscal measures that might be used to address a future economic downturn.

The emphasis of the note is on examining the effects of the fiscal expansion within a standard theoretical framework - specifically the Dornbusch IS-LM-IP model. Using this theoretical model, the note follows through the transmission mechanisms of fiscal policy in the economy in the very short, medium and long run (steady-state).

The scenario is a broad fiscal expansion where government purchases in the market, general government investment, general government employment and defence force employment are all permanently increased. The government is assumed to maintain a balanced budget throughout the period of the expansion by immediately funding the increase in spending through higher taxes. It is also assumed that the shock is not anticipated by agents prior to it taking place, though once the shock is imposed agents are aware that it is permanent.

TRYM is used to flesh out the impacts and transmission mechanisms and to illustrate the dynamic paths of adjustment. The charts included throughout this note illustrate the dynamic and steady state effects generated by a TRYM simulation after a permanent one per cent balanced budget increase in government expenditure and employment.

The version of TRYM used in this exercise includes a number of significant modifications that have emerged out of the ongoing model redevelopment project. A short summary of these changes can be found at Appendix A. While we are broadly happy with the results of the TRYM simulation, there continue to be a number of issues that have been identified but that have not yet been addressed. That said, we anticipate that this exercise will assist Treasury to analyse how fiscal policy affects the Australian economy.

The economy's response to a fiscal expansion (or for that matter, any development) is strongly dependent on how economic policy makers respond. Specifically, the nature of the fiscal and monetary responses are important. Here we assume a balanced budget fiscal expansion so that taxes immediately adjust to fully fund any increase in government spending.[1]

Reflecting Australia's independent monetary policy, the monetary authority is assumed to respond to the fiscal shock by varying short-term interest rates. We assume that the monetary authority targets output, inflation and the price level as per an augmented Taylor rule.[2] These issues will be explored in detail in a forthcoming MMU note on monetary policy.

The short, medium and long run effects of the fiscal shock as generated by TRYM are summarised at Appendix B. The discussion in this note and all figures are presented as percentage deviations

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[1] The default fiscal response function in TRYM is to adjust the tax rate on labour and capital income so that a constant government debt to GDP ratio is maintained in the long run. This can allow the budget to be out of balance for extended periods of time.

[2] The weights assumed in the TRYM simulation are 0.5, 0.5 as originally suggested by Taylor (1993) while a weight of 0.1 is placed on the price level, reflecting Australia's interest in inflation over the cycle. The use of a Taylor rule is an extension of a velocity of money rule that is traditionally used in Dornbusch and other models.

from where the economy would have been without a shock. That is, the marginal effects of fiscal policy are considered.

2.   A Theoretical Framework

The IS-LM framework with rational expectations provides a good basis for understanding the effects of a fiscal expansion in an environment of a freely floating exchange rate, perfect capital mobility and prices that are sticky in the short run. This analysis is consistent with the Mundell-Fleming and Dornbusch models.

Chart 2.1
Fiscal Expansion under Rational Expectations
and a Floating Exchange Rate and Perfect Capital Mobility
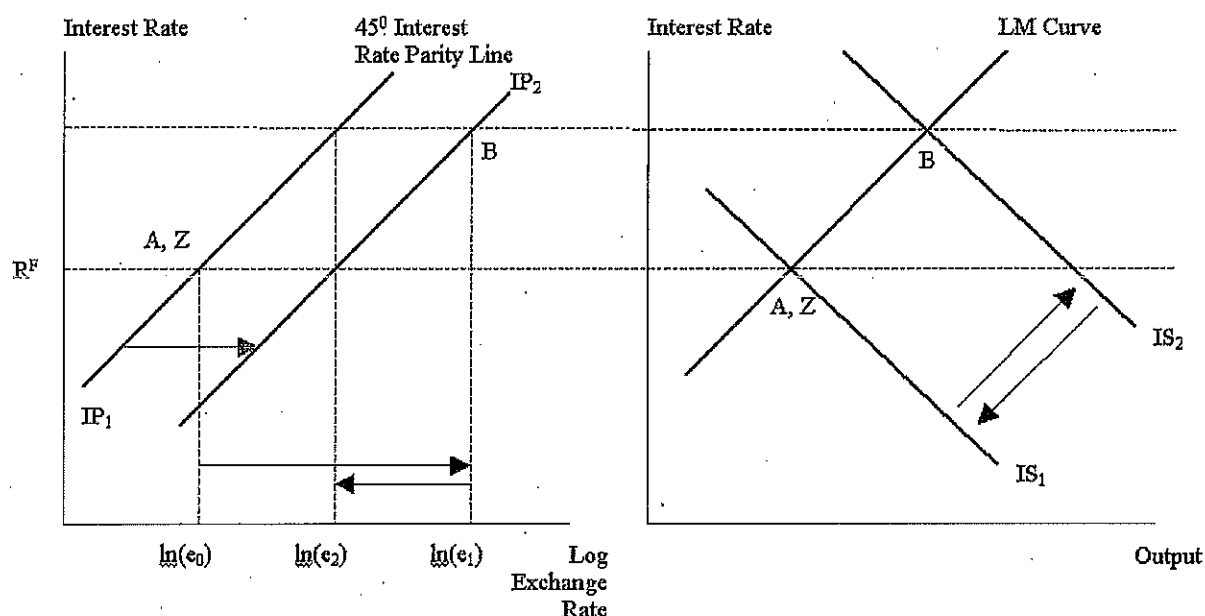
The adjustment process is outlined in Chart 2.1. The progression of a fiscal expansion is as follows:

(i)   Increased government expenditure shifts the IS curve shifts out along the LM curve. This lifts the domestic interest rate above the world interest rate (R^F) and takes us from point A to point B.[3] Interest rates increase because the increased economic activity lifts the demand to hold money, while the supply of money is fixed (by the monetary authority).

(ii)   Under rational expectations the Interest Rate Parity (IP) line shifts to the right to IP_2 resulting in an appreciation of the exchange rate to e_1.[4] The IP curve has a 45 degree slope reflecting the interest rate parity idea that an interest rate differential must be matched by a

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[3] While traditionally a bond-financed fiscal expansion with accumulating government debt is examined in these exercises, here we are looking at a balanced budget expansion. However, regardless of whether the expansion fully funded or not, the IS will shift to the right. In the case of a balanced budget expansion, this is the familiar Keynesian balanced-budget multiplier scenario.

[4] The IP curve represents the real interest rate parity condition $R-R^f=\ln(e_0)-\ln(_0e_1)$. The idea is that a gap between domestic and foreign interest rates must be matched by an expected change in the exchange rate. The IP curve will shift if there is a change in the foreign interest rate R^F or a change in exchange rate expectations $_0e_1$.

correspondingly equal expected change in the exchange rate. Note here that the IP curve intersects the R^F line at the new expected equilibrium. For the time being though we are on IP_2 at B where $R>R^F$ and $e_1>e_2$ (a higher exchange rate).

(iii)   As the Marshall-Lerner conditions hold, the appreciation leads to a fall in net exports which shifts the IS curve back to its original position. Interest rates fall back to R^F as a consequence and the exchange rate moves back down the IP curve to e_2.

In the end, the fiscal expansion is ineffective in terms of lifting output, leaving us only with a higher exchange rate. The higher exchange rate reflects the adjustment of expectations that come about with rational agents anticipating the required response of net exports to the increase in government spending.

Notice that $e_0 < e_2 < e_1$ as per the Dornbusch (1976) overshooting model. This comes about because the domestic goods market is slow to adjust to changes in the exchange rate, which in turn adjusts very quickly under rational expectations.

This analysis abstracts from any effects of fiscal policy on supply. If the fiscal policy expansion leads to a long-run change in aggregate supply then output will change by the same amount too.

Appendix C includes tables that systematically follow through the impacts of a fiscal expansion in the long, short and medium run.

3.   Overview of Model Results from a Fiscal Shock

The impact of a one per cent balanced budget fiscal expansion are summarised in Table 3.1.

GDP remains higher for around three years. While the government sector is around a quarter of GDP the immediate impact of the one per cent shock is around 0.13 percentage points. This reflects the immediate crowding out due to higher interest rates, tax rates and exchange rates. In the long run GDP is lower reflecting the switching of resources from the private to public sector.

Unemployment rate is initially lower reflecting stronger government employment. In the long run unemployment is unchanged.

Prices are initially lower due to an exchange rate appreciation feeding through to lower import prices and lower domestic prices.

In the next three sections we examine the effects of the fiscal expansion in more detail. The long-run effects are discussed first, then the very short-run (first quarter) impacts and finally the medium-term adjustment to the steady-state. The precise adjustment paths as suggested by TRYM are also presented. The magnitudes of the long, short and medium-run deviations of the major aggregates as generated by the TRYM simulation are listed in Table 3.1.

More detailed results of the TRYM simulation are at Appendix B.

Table 3.1
Deviation Magnitudes of 1 Per Cent Fiscal Expansion using TRYM

	First Quarter	First Year	Second Year	Fifth Year	Long Run
Government Activity	+1.0 ↑	+1.0 ↑	+1.0 ↑	+1.0 ↑	+1.0 ↑
Consumption	-0.01 ↓	-0.01 ↓	-0.05 ↓	-0.20 ↓	-0.23 ↓
Enterprise Investment	+0.04 ↑	+0.08 ↑	-0.01 ↓	-0.27 ↓	-0.11 ↓
Imports	+0.25 ↑	+0.30 ↑	+0.20 ↑	+0.01 ↑	+0.07 ↑
Exports	-0.01 ↓	-0.05 ↓	-0.10 ↓	-0.18 ↓	-0.23 ↓
Aggregate Output (GDP)	+0.13 ↑	+0.10 ↑	+0.04 ↑	-0.06 ↓	-0.03 ↓
Aggregate Prices	-0.01 ↓	-0.03 ↓	-0.02 ↓	+0.03 ↓	Unchanged
Price of Imports	-0.12 ↓	-0.23 ↓	-0.26 ↓	-0.14 ↓	-0.16 ↓
Real (Producer) Wage	-0.03 ↓	+ 0.03 ↑	+0.08 ↑	+0.07 ↑	+0.02 ↑
Exchange Rate	+0.21 ↑	+0.27 ↑	+0.27 ↑	+0.13 ↑	+0.16 ↑
Interest Rates[⊛]	+0.03 ↑	+0.05 ↑	+0.05 ↑	-0.01 ↓	Unchanged

⊛ - Percentage point deviation

4. Long Run Responses to a Fiscal Shock

The long run response of GDP to a fiscal expansion will largely be driven by the supply-side factors. These are explained below using the neoclassical (supply driven) framework that ensures equilibrium in the long run. Consequently it is the change in general government employment that is central to explaining the deviations in the steady state as a result of a fiscal shock.

By assumption, the aggregate labour force and participation rate will be unchanged in the long run (that is, they do not change as a result of the fiscal expansion). As a consequence any increase in general government sector employment must ultimately be mirrored by a fall in enterprise (private business and government enterprise) employment. We can therefore expect the enterprise capital stock to fall reflecting the production technology.[5] Correspondingly we would expect an equivalent fall in enterprise investment to match the lower enterprise capital stock (see Chart 4.1).

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[5] The fall in enterprise employment will reduce the marginal product of capital (for a given capital stock) so that the capital stock must fall to restore the product of capital with the interest rate. This abstracts from the effects of movements in the price of capital.

Given the fall in the enterprise factors of production, enterprise output can be expected to fall in the long run as per Chart 4.1.

Chart 4.1
Enterprise Output and Enterprise Investment
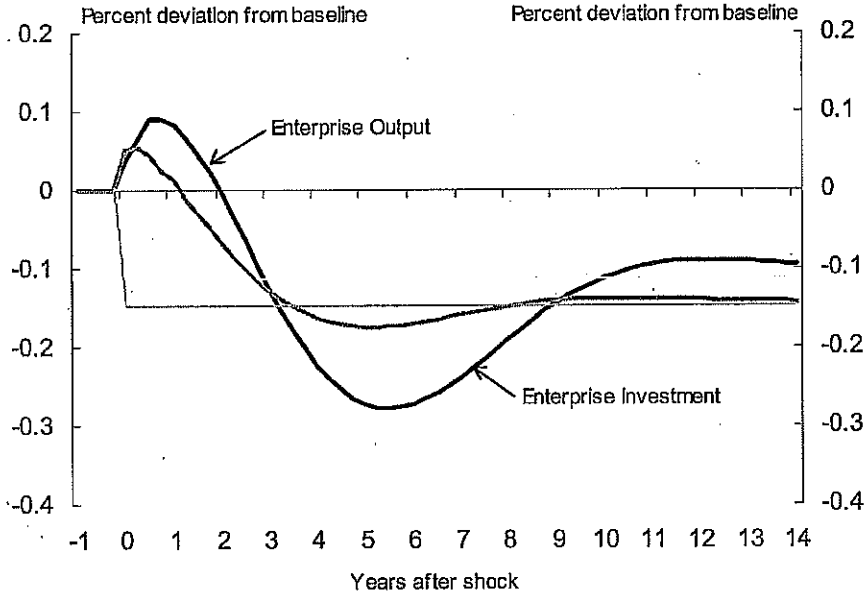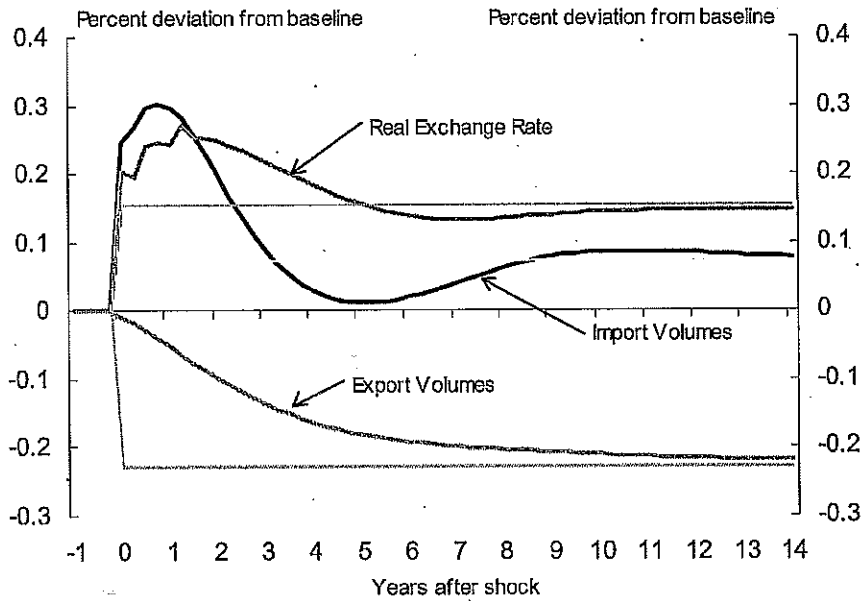**Deviations from Baseline**

Chart 4.2
Imports, Exports and the Real Exchange Rate
Deviation from Baseline

Given the relative productivities in the public and private sector, the change in the shares of total

employment between these two sectors, and the accompanying reduction in business capital, the fiscal expansion will ultimately result in a fall in total output.

The long-run fall in economic activity will produce a shift inwards of the aggregate supply curve. The balance in aggregate demand and supply is partly restored by a fall in net exports, which will be produced by an appreciation in the real exchange rate. As illustrated in Chart 4.2, an appreciation in the real exchange rate results in a long-run increase in import volumes (despite lower demand due to lower domestic output and income) and a decline in export volumes.

An exchange rate appreciation will also result in a fall in the price of tradeables relative to the price of non-tradeables. Consequently investment goods, which are relatively import intensive, become cheaper relative to producer prices (see Chart 4.3).[6]

With the relative price of investment goods falling slightly, the user cost of capital falls a little. We would expect to move down the marginal product of capital curve and the return to unit capital to also fall. The enterprise investment to output ratio would be expected to increase and the real producer wage will increase slightly as the output to labour ratio rises.

Chart 4.3
Price of Enterprise Output and Price of Enterprise Investment
Deviations from Baseline
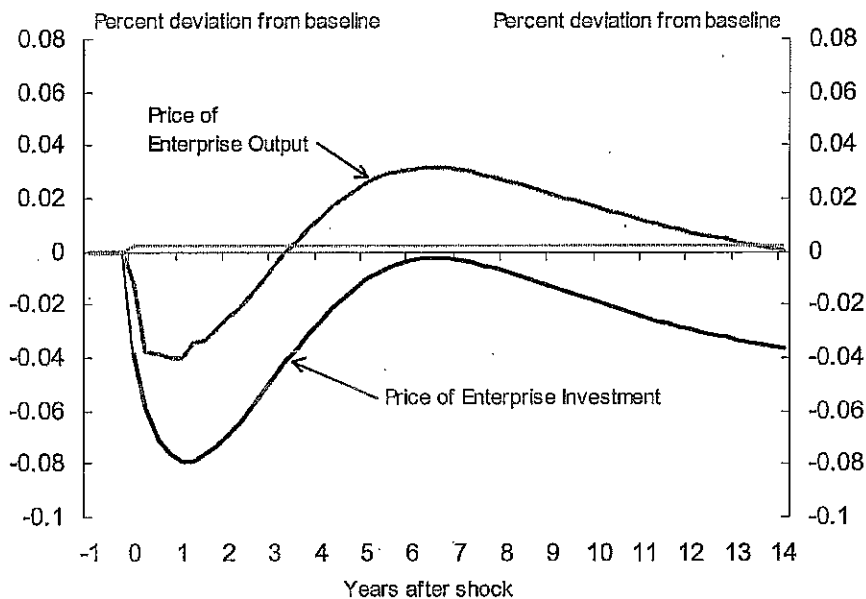
[6] Another way to think of this is that given the real appreciation, we can expect the relative $A price of imports to fall. A good's price relative to aggregate prices depends on its relative import intensity – that is the price of goods follow the aggregate price level except where changes in import prices drive apart the price of goods with different relative import intensities. We can therefore expect the price of capital goods, which are relativity import intensive, to fall relative to aggregate prices and in particular relative to enterprise producer prices.

Chart 4.4
Consumption, Real Disposable Income and Real Wealth
Deviations from Baseline
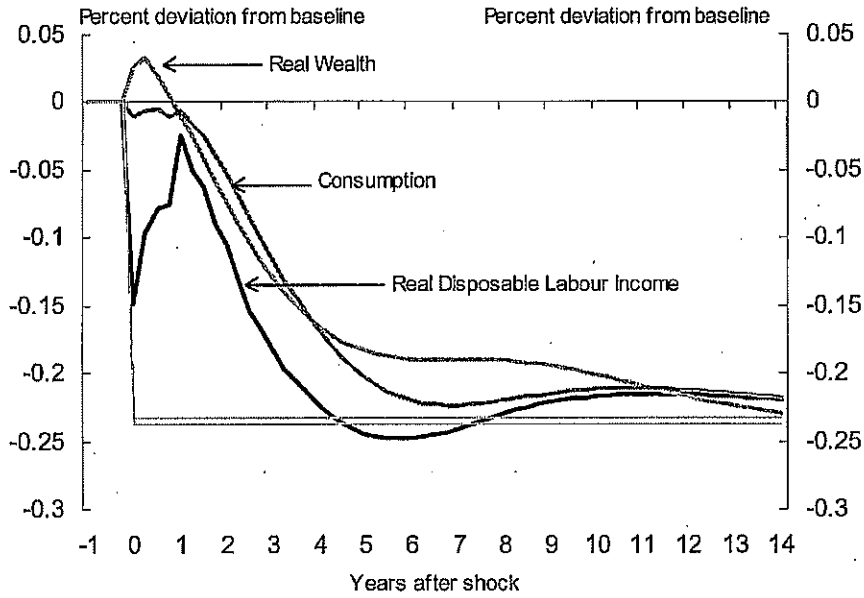
Household consumption declines partly as a result of the fiscal response function giving higher taxes which lower disposable income. A fall in real household wealth also contributions to lower consumption in the long run (Charts 4.4). Real wealth falls due to lower nominal wealth, although it is somewhat tempered by a small fall in consumption prices.

Chart 4.5
Current Account Balance and Net Income Position
Deviations from Baseline
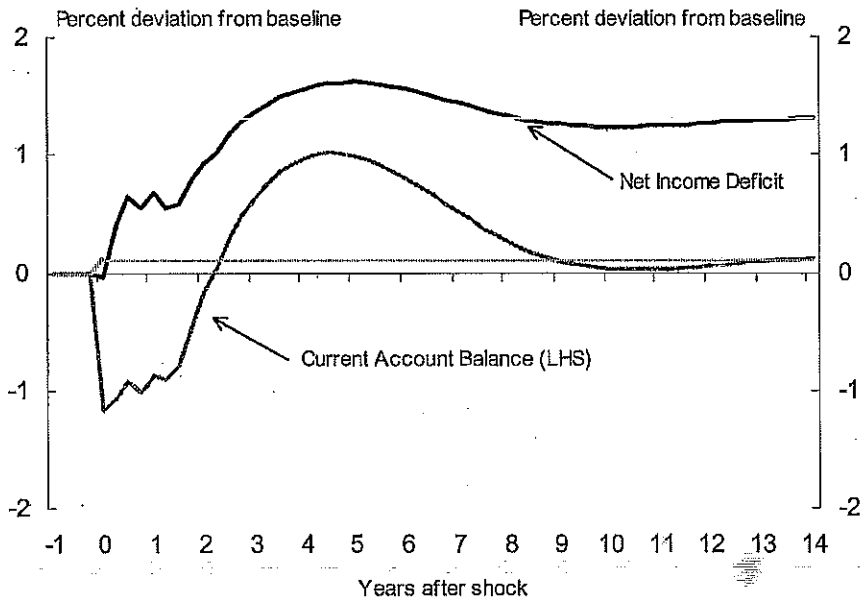
The fall in nominal wealth largely reflects in the declines we see in the nominal private capital stocks with both real capital stocks (enterprise and dwelling) as well as lower enterprise and dwelling investment prices.

While we expect that the appreciation in the real exchange rate leads to an unequivocal deterioration in the trade balance, we can actually get an improvement in the current account deficit as a result of the fiscal expansion, depending on how the net income deficit responds. Given that we have a long-run fall in net exports, our ability to sustainably service foreign liabilities will decline and therefore we would expect capital outflows to decline and therefore the current account deficit improves.

An alternative argument is based on the expectation that the direction of movement of net income will largely be a consequence of movements in dividends and profits paid overseas. In TRYM's net lending framework, dividends and profits paid overseas are related to the q-ratio and therefore investment prices. As we saw earlier, investment prices fall which can lead to a decline in overseas holdings of Australian equities.[7] The improvement in the net income deficit can also come about due to the revaluation effects of the exchange rate appreciation.

Additionally, given that in the long run we are dealing with a balanced budget fiscal expansion, the public sector borrowing requirement will not drive changes in Australia's net foreign liabilities position. Changes in Australia's net foreign liabilities solely reflect changes in the holdings of private equities and debt by foreign creditors and Australian private holdings of overseas assets.

5.   The Very Short Run (the first quarter)

In the short run the response to a fiscal expansion is very much determined by the demand side with sticky prices and the slow adjustment of capital stocks leaving the supply side relatively slow to adjust. As such, the IS-LM framework is helpful in understanding the very short-run responses to a fiscal shock.

Chart 5.1 illustrates the effects of the shock on the enterprise sector with TRYM. As noted earlier, we see an immediate positive response in enterprise output to the increase in government demand. However, a vast majority of the short-run increase in enterprise output is met by a jump in capacity utilisation with the capital stock slow to adjust and enterprise employment actually falling in the first few quarters after the shock as labour is conscripted away from the private sector.

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[7] In TRYM, overseas holdings of Australia equity is related to market prices of the enterprise sector capital stock. The enterprise q-ratio represents the market price of capital divided by replacement cost. By dividing by the price of enterprise investment goods we can derive a measure of the market price of the enterprise sector capital stock.

Chart 5.1
Enterprise Sector Output and Factors of Production
**Deviations from Baseline**
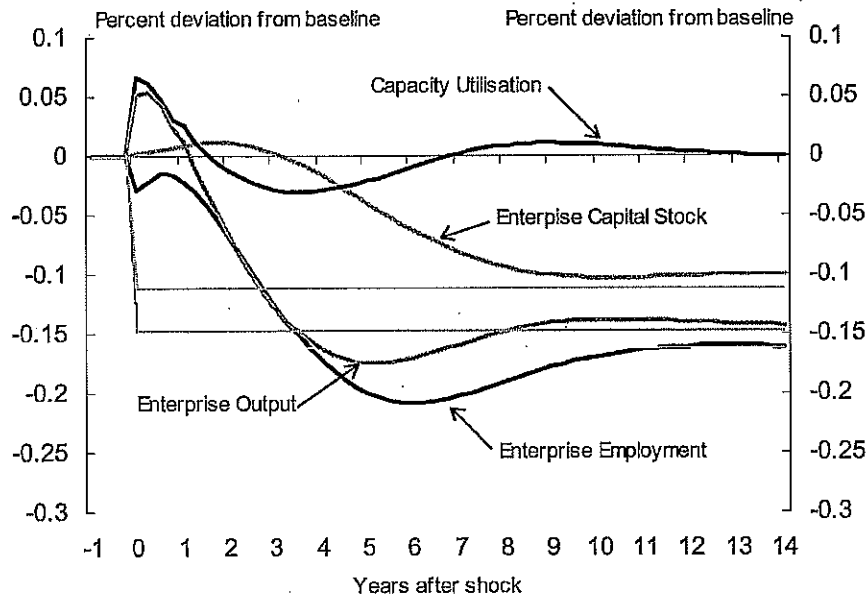
6. The Medium Run (Adjustment Path)

An interesting feature of the medium-term response to the fiscal expansion is the initial jump in enterprise investment on the back of the higher aggregate demand and the higher enterprise capacity utilisation (see Chart 5.1). This is despite the crowding out effect of higher interest rates (see Chart 6.1) through the enterprise sector q-ratio.

Chart 6.1 illustrates the strong short-to-medium term link between interest rates and the exchange rate. While in the long run the equilibrium exchange rate is determined by aggregate supply and demand conditions and changed expectations, in the shorter run it is also linked to interest rate differentials as modelled in the IS-LM-IP framework. Given that Australia is a small open economy, world interest rates will not move as a consequence of the fiscal expansion and therefore movements in domestic interest rates alone will determine how the exchange rate behaves in the short to medium term. This is reflected in the correlation we see between the real exchange rate and the interest rates in Chart 6.1.

Chart 6.1
Exchange Rate and Interest Rates
Deviations from Baseline
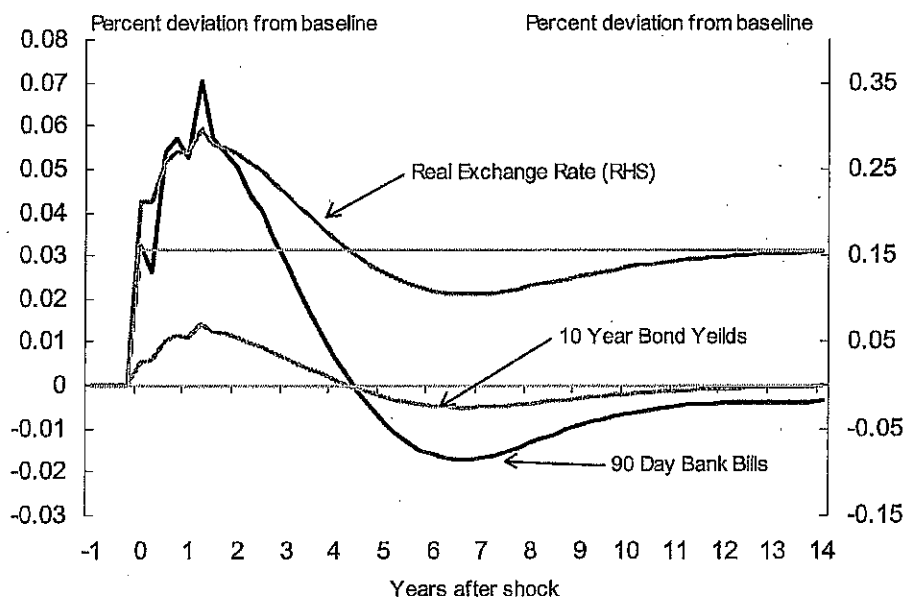
7. Summary

The positive effects of a permanent balanced budget fiscal expansion are only a short-run phenomenon. TRYM suggests that the positive effects on output are fully reversed after 3 years with higher taxes, higher interest rates and a higher exchange rate all adjusting to bring the economy back to its productivity determined steady-state growth path. Moreover, the shifting of resources from the private to the public sector means that in the long run output will be below the level it would have been at if the expansion had not taken place.

As we saw, the long-run effects of the expansion are very much a consequence of the press-ganging of labour from the private to the public sector.

The effects of the permanent fiscal shock generated by TRYM are very much in line with theoretical priors. In particular we see behaviour that is consistent with the rational expectations IS-LM-IP Dornbusch overshooting model.

8. Further work

Following feedback on this note, there are a number of directions in which MMU can extend its fiscal policy analysis. In particular we have plans to examine temporary rather than permanent fiscal expansions. Additionally we will be looking more closely at a bond-financed fiscal expansion and the performance of TRYM's default fiscal policy response function. Special attention will be paid to determining whether it is actually counter-cyclical and its interaction with various monetary response functions.

APPENDIX A
RECENT CHANGES TO TRYM

- The model's private enterprise production function has been reworked including integrating public enterprises with private business giving an aggregate enterprise sector, overhauling the enterprise capital stock, respecifying the enterprise q-ratio in history, and removing (negative) capital efficiency growth from the model.

- The relative price block has been respecified to give a more consistent relationship between import prices and the price of domestically produced goods.

- A Taylor's Rule Monetary Response Function has been implemented.

- Rational Expectation formulation has been adopted in Yield Curve Equation (**not included in this simulation**).

- The Exchange Rate equation has been made more consistent with theory of uncovered interest rate parity.

- The Dwelling Investment equation has been respecified to give a more realistic short-run response to interest rates.

- Numerous other smaller changes and correction to both behavioural and identity equations including to the net lending framework.

APPENDIX B
SUMMARY TABLE OF RESULTS OF A PERMANENT FISCAL EXPANSION

		First Quarter	Second Quarter	First Year	Two Years	Five Years	Steady State
Consumption	con	-0.01	-0.01	-0.01	-0.05	-0.20	-0.23
Dwelling Investment	idw	-0.04	-0.08	-0.37	-0.82	-0.68	-0.26
Enterprise Investment	ie	0.04	0.07	0.08	-0.01	-0.27	-0.11
Enterprise Capital Stock	ke	0.00	0.00	0.01	0.01	-0.04	-0.11
Non-farm Stocks*	snn	0.01	0.00	0.00	0.00	0.00	0.00
Farm Stocks*	sfm	0.00	0.00	0.00	0.00	0.00	0.00
Gross National Expenditure	gnea	0.19	0.20	0.18	0.10	-0.01	0.04
Trade Balance*	tb	-0.06	-0.01	0.00	0.00	0.00	0.00
Gross Domestic Product	gdpa	0.13	0.14	0.10	0.04	-0.06	-0.03
Consumption Deflator	pcon	-0.02	-0.03	-0.04	-0.03	0.01	-0.01
Dwelling Deflator	pidw	-0.02	-0.04	-0.04	-0.03	0.02	-0.01
Investment Deflator	pie	-0.04	-0.06	-0.08	-0.07	-0.01	-0.04
GNEA Deflator	pgnea	-0.01	-0.02	-0.03	-0.02	0.03	0.00
Price of Imports	pmgs	-0.12	-0.15	-0.23	-0.26	-0.14	-0.16
Price of Exports	pxgs	-0.10	-0.17	-0.21	-0.20	-0.08	-0.11
GDP Deflator	pgdpa	0.00	-0.02	-0.02	0.00	0.04	0.01
Price of Enterprise Output	pge	-0.01	-0.04	-0.04	-0.03	0.03	0.00
Rate of Tax on Labour Income	rtn	0.95	0.90	0.70	0.94	1.23	1.08
Enterprise Wage Rate	rwe	-0.04	-0.01	0.02	0.06	0.10	0.02
Total Wage	rwt	0.01	0.04	0.06	0.09	0.14	0.06
Real Wage Rate	rrwr	0.00	0.01	0.02	0.03	0.03	0.02
Real After-tax Wage Rate	rrwrat	-0.05	-0.04	-0.02	-0.03	-0.05	-0.05
Nominal After-tax Labour Income	ynz	-0.17	-0.13	-0.07	-0.13	-0.24	-0.24
Enterprise Capacity Utilisation	cult	0.00	0.00	0.00	0.00	0.00	0.00
Import Volumes	mgs	0.25	0.27	0.30	0.20	0.01	0.07
Export Volumes	xgs	-0.01	-0.02	-0.05	-0.10	-0.18	-0.23
Non-commodity Exports	xnc	-0.03	-0.05	-0.11	-0.18	-0.24	-0.23
Commodity Exports	xc	0.00	-0.01	-0.03	-0.06	-0.15	-0.23
Current Account Balance	bcaz	-1.17	-1.07	-0.87	-0.18	0.99	0.10
Enterprise Employment	nee	-0.03	-0.02	-0.02	-0.07	-0.20	-0.16
Total Employment	net	0.11	0.12	0.12	0.08	-0.03	0.00
Labour Force	nlf	0.08	0.07	0.06	0.03	-0.01	0.00
Unemployment Rate #	rnu	-0.03	-0.05	-0.06	-0.04	0.02	0.00
Vacancies	nv	3.21	2.94	1.73	0.40	-0.67	0.00
90 Bank Bills #	ri90	0.03	0.03	0.05	0.05	-0.01	0.00
10 Year Bonds #	rigl	0.01	0.01	0.01	0.01	0.00	0.00
Exchange rate	retwi	0.21	0.21	0.27	0.27	0.13	0.16
Real Exchange Rate	rretwi	0.20	0.20	0.24	0.25	0.16	0.16
Terms of Trade	tot	0.00	0.00	0.00	0.00	0.00	0.00
Public Sector Borrowing	psbr	0.00	0.00	0.00	0.00	0.00	0.00
Net Income Balance	nid	-0.04	0.39	0.68	0.93	1.62	1.31
Current Account Balance	bcaz	-1.17	-1.07	-0.87	-0.18	0.99	0.10
National Savings	nsav	-0.07	-0.06	-0.06	-0.08	-0.03	-0.03
Net Foreign Liabilities	vnflz	0.08	-0.05	-0.10	-0.13	-0.10	-0.11
Nominal Wealth	vmz	0.01	0.00	-0.05	-0.10	-0.18	-0.25

* difference in per cent contributions to GDP growth
# percentage point deviations from baseline

APPENDIX C
SUMMARY TABLES OF TRANSMISSION MECHANISMS

Tables C.1, C.2 and C.2 follow through the transmission of the fiscal expansion in the long, short and medium term. These effects are discussed in more depth in sections 3, 4 and 5 of the note.

Table C.1
Transmission of a Fiscal Expansion in the Long Run

Movement	Rationale
Government Activity ↑	Fiscal Shock
Household Consumption ↓	Higher taxes reduce disposable income.
Enterprise Capital ↓	Because enterprise employment falls and expect labour/capital ratio to be broadly unchanged.
Enterprise Output ↓	Due to fall in both factors of enterprise sector production.
Total Output ↓	Enterprise sector is the majority of total output.
Net Exports ↓	Required to restore equilibrium in the goods market.
Exchange Rate ↑	Price signals that accommodate the fall in net exports.
Unemployment Rate Unchanged	No labour market reform or other changes. Also labour force, participation rate and total employment are unchanged in the long run.
Government Employment ↑	Fiscal Shock
Enterprise Employment ↓	Reflecting no changes in total employment and increased government employment.

Table C.2
Transmission of a Fiscal Expansion in the Very Short Run

Movement	Rationale
Government Activity ↑	Fiscal Shock
Aggregate Output ↑	Government demand is a component of Aggregate Output
Aggregate Prices ↑	Aggregate Demand > Aggregate Supply
Interest Rates ↑	Taylor Rule response to higher output and higher price level.
Exchange Rate (Real and nominal) ↑	Long run is brought forward by expectations & high interest rates relative to rest of world.
Price of Imports ↓	Due to exchange rate appreciation.

Table C.3
Transmission of a Fiscal Expansion in the Medium Term

Movement	Rationale
Enterprise Investment ↑ then ↓	Enterprise production jumps and the producer wage increases. Eventually interest rate increases cause the q-ratio to fall and investment comes off.
Consumption ↑ then ↓	Increase in wage and the delayed increase in taxes give initially higher after-tax labour income. Initial fall in consumption deflator due to effect of appreciation. Real wealth also higher for a short period. Eventually consumption adjusts to the lower steady state reflecting falls in real wealth and lower after-tax labour income. In the longer term the increase in tax rates erodes disposable income so that consumption falls.
Exports ↓	Exchange Rate appreciation
Imports ↑	Aggregate Output (import demand) remains higher in the medium term and import prices fall due to exchange rate appreciation. In the longer term output is lower but the permanently higher exchange leaves imports higher.
Real (Producer) Wage ↑	Tighter labour market (unemployment rate falls)