THE MACROECONOMICS OF FOREIGN

INVESTMENT IN AUSTRALIA

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of the Australian National University.

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The work presented in this thesis is to the best of my knowledge and belief, original, except as acknowledged in the text. The material has not been submitted either in whole or in part for a degree at any other university.

A.J. Makin

(A.J. Makin)
Preface and Acknowledgements

This thesis evolved from my experience as a Senior Finance Officer in the Balance of Payments Section of the Australian Treasury between 1984 and 1986. During those years, Australia's current account deficit and international investment position emerged from relative obscurity to become the main focus of macroeconomic policy. At the time, I argued that Australia was characteristically a capital importer and that, under the newly adopted floating exchange rate regime, the external deficit was not important, in and of itself. My view was consistent with the orthodox Humean perspective that external imbalances were essentially self correcting and should not be macroeconomic policy targets. For reasons still somewhat unclear, this view suddenly became heresy. It is hoped that in part this thesis may further contribute to establishing as orthodox what is still deemed heterodox.

I would like to thank my supervisors, Professor John Pitchford and Dr Graeme Wells, for their thoughtful and constructive suggestions on the original thesis outline and for comments on draft chapters. Thanks also to Professor Allan Layton for assisting with the econometrics of Chapter 6 and to numerous anonymous journal referees for comments on previously published articles on which several chapters are largely based.

Last, but not least, thanks to Robyn Wieland, Margaret Cowan and Kim Innes for typing and retyping the manuscript.
Abstract

This thesis examines the causes and consequences of Australia's external "imbalance" in the 1980's by highlighting the macroeconomic gains from international trade in saving.

After developing an extended international accounting and measurement framework which includes new inflation-adjusted measures, several stylized facts are presented as the basis for subsequent theoretical and empirical analysis.

Traditional theoretical approaches to external account determination, such as the classical, elasticities, absorption, monetary and Mundell-Fleming models, are critically evaluated against the measurement framework and are found wanting because they fail to systematically tie the current account, the capital account and foreign investment to the process of real international capital transfer. Alternatively, more meaningful capital-theoretic models of the external accounts which link saving, domestic investment and foreign investment are adapted to demonstrate the macroeconomic gains from international capital mobility and foreign investment.

From a saving-investment perspective, it is argued that Australia's widened external imbalance in the 1980's primarily reflected a rise in private investment activity, though fiscal activity also influenced domestic saving behaviour. It is also argued that greater capital mobility and increased global integration of financial markets were facilitating factors behind the increase in Australia's capital account surplus.

Using the precepts of the capital-oriented approaches to external account determination, econometric estimates gauge the extent to which the higher capital inflow and associated current account imbalances improved national output and income over the
1980's. Relatedly, new stock measures reveal that national net worth improved substantially over this time, notwithstanding the sharp rise in external debt.

Finally, the thesis questions official and popular concerns about Australia's external position and the effectiveness of industry based proposals to address it. Macroeconomic policy responses which target the external accounts are also considered misplaced in light of Australia's dependence on capital imports.
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CHAPTER 1

INTRODUCTION

Under the generalised system of floating exchange rates, policymakers in Australia and other countries during the 1980's often interpreted the traditional macroeconomic policy goal of external balance as balance on the current account of the international accounts. Over the same time that external account imbalances became a concern, global financial markets were also, not coincidentally, increasingly liberalised. The subsequent liberalisation gave rise to substantially increased capital mobility, and national saving and investment rates were no longer as closely correlated as in earlier decades. These developments prompted a range of economic policy prescriptions to bring about external adjustment.

For example, the Economic Report of the President of the United States in 1987 argued that "... the principal challenge of policy co-ordination was to reduce present international payments imbalances in a manner that supported sustained, non-inflationary growth in the world economy." (p.120) The International Monetary Fund (1989) and the Bank for International Settlements (1989) expressed similar concerns.

That current accounts should be balanced presumes nations should be neither exporters nor importers of capital. Is this economically justifiable? Indeed, could increased capital outflows matching higher current account surpluses have benefited some countries, at the same time as greater capital inflows matching current account deficits benefitted others?
Over the 1980's, the current accounts of Australia and the United States, as a proportion of GDP, averaged significant deficits of around 5 percent and 2 percent, whereas Japan and West Germany each sustained surpluses of around 2 percent. Such imbalances may seem large compared with for instance, the 1930's, 1940's and 1950's, decades characterized by prohibitive exchange controls, or with the 1960's and 1970's when controls became less stringent. The panoply of exchange controls of earlier decades reflected a somewhat xenophobic view of foreign money which prevailed during the interwar period. John Maynard Keynes (1933) reinforced this view by writing that: "Ideas, knowledge, science, hospitality, travel — these are the things which should of their nature be international. But let goods be homespun whenever it is reasonable and conveniently possible, and above all else let finance be primarily national" (quoted in Kindleberger (1987, p.67)). Still later, Keynes (1941, p.23) declared that "... nothing is more certain than that the movement of capital funds must be regulated." (See also United Nations (1949)).

International financial market reforms particularly since the early 1970's essentially eliminated the host of regulatory controls over international capital movements imposed after the Second World War. Nonetheless, international funds may be no more mobile across borders today than in the relatively frictionless international environment of the late 19th century and the early decades of this century. For example, the flow of capital from the United Kingdom persistently averaged over 5 percent of GDP between 1870 and 1913 (Edelstein (1982)), while the flow of capital into Canada reached a peak of 13 percent of GDP between 1910 and 1913 (Krugman (1989)).

In Australia, the state of the external accounts became the primary focus of macroeconomic policy from the mid-1980's. Indeed, the latest data releases on the current
account deficit, published monthly by the Australian Bureau of Statistics, were major news events, and strongly influenced the stance of monetary and fiscal policy. In the 1985–86 Budget Speech, the then Federal Treasurer, Mr. Keating, argued that the Government's prime concern was to "set in place the preconditions for a turnaround in the current account deficit" (p.26) thus confirming that the goal of external balance had been put at the top of the Government's macroeconomic policy agenda. The Federal Treasury (1985: p.62) echoed this concern in Budget Statement No. 2 of the Budget Papers, the main message of which was that the strategy of fiscal restraint was necessary to ensure "... a lasting solution to Australia's external account problems ...". Treasury (1985: p.55) further noted that "... failure in these efforts would make virtually inevitable the path of serious recession as the sole remaining means of correcting Australia's external imbalance". The Reserve Bank of Australia (1985: p.2) assessed the position in much the same way by stating that "the outlook remains dominated by the need to restore external balance".

By the end of the 1980's, little had changed. The Federal Treasury (1989: p.53) continued to argue that macroeconomic policy was aimed at achieving "... sustained improvement in the current account." In short, over the entire second half of the 1980's, macroeconomic policy in Australia was driven by a perceived need to target the external account imbalance. Indeed, this policy was endorsed in the 1991 report of a major Federal Parliamentary enquiry on Australia's current account deficit and external debt.

Notable academic economists agreed with the official interpretation and policy response to the widened current account imbalance. For instance, Arndt (1989, p.14) concluded that Australia had "... a serious balance of payments and foreign debt problem." Similarly, Nguyen (1989, p.1) stated: "One of the most serious economic problems in
Australia during recent years has been the persistently large deficit on the current account of the balance of payments."

A contrary view was expressed by Makin (1987, 1988a, 1988b, 1989), Harper and Lim (1989), Pitchford (1989, 1990), Forsyth (1990) and Corden (1991). Amongst these, Pitchford was most prominent in promoting the view that the current account deficit should not matter for macroeconomic policy purposes. In particular, Pitchford was concerned that tight fiscal and monetary policies aimed at narrowing the current account deficit by reducing aggregate demand would entail unjustified and unnecessary short run costs in terms of reduced output.

Using both theory and evidence to further develop the contrary view, this present work explains why the current account deficit and external debt increased throughout the 1980's in the first place. Moreover, to further counter the official view of external account developments over this time, this thesis provides empirical evidence suggesting that the widened current account deficit and higher external debt levels were in fact welfare enhancing at the macroeconomic level.

The arguments develop as follows. Chapter 2 introduces and extends the external accounting and measurement framework necessary for subsequent theoretical, empirical and policy analysis. After introducing new methods for adjusting relevant data for the distortionary effects of inflation, this chapter then presents some important stylized macroeconomic facts for the 1970's and 1980's. These facts form the basis of later empirical analysis.

As a first step toward providing an appropriate theoretical paradigm for evaluating the behaviour of Australia's external accounts, Chapter 3 critically surveys the theoretical approaches which have hitherto dominated the international macroeconomics literature.
These traditional approaches include the classical, elasticities, absorption, monetary and Mundell–Fleming models. The shortcomings of these models, particularly the limitations of the Mundell–Fleming, or open economy Keynesian, approach are highlighted before considering a wholly different class of models in Chapter 4.

These alternative approaches, which include neoclassical foreign investment theory, intertemporal models and an international variant of loanable funds analysis, can be used to demonstrate the macroeconomic significance of capital mobility and the gains from international trade in saving. Capital centred approaches provide key insights about the desirability or otherwise of external imbalances and also provide the foundations for the saving–investment paradigm, on which the remainder of the thesis is essentially based.

In Chapter 5, a range of internal and external influences on Australia's pattern of saving and investment are critically examined. These include the main determinants of saving and investment themselves, along with fiscal activity, the terms of trade and monetary policy. The chapter also considers the extent to which Australia's capital markets became more fully integrated with international capital markets or, alternatively, the extent to which international capital became more mobile in the wake of the extensive worldwide financial liberalisation of the 1980's.

Chapter 6 then provides new methodologies for empirically estimating the macroeconomic welfare gains from the widening of Australia's saving–investment imbalance and the associated rise in external debt in the 1980's. Compatible estimation techniques reveal that, consistent with the theoretical perspectives of Chapter 4, Australia was made economically better off, not worse off, from the rise in foreign investment in the 1980's.
Chapter 7 concludes the thesis by considering some of the fallacies which apparently justified having the external imbalance as an explicit target of macroeconomic policy. The final chapter also demonstrates why certain policy responses are, in any case, ineffective instruments for influencing the external accounts.
CHAPTER 2
EXTERNAL ACCOUNTING AND MEASUREMENT ISSUES'

2.1 Introduction

The purpose of this chapter is to outline the international macroeconomic accounting foundations for interpreting Australia's external position and present the relevant data for the 1970's and 1980's. The chapter also addresses some key measurement issues, stressing the distortionary effect of domestic inflation on the external accounts and the other major sectoral imbalances. In conclusion, certain stylized facts about the open Australian economy are presented as a basis for later empirical analysis.

In an open economy, resident households, firms and governments are linked every day to an all pervasive network of international economic relations through the prices and quantities of goods, services and financial assets they buy and sell. Whenever funds are exchanged between a resident and non-resident entity, the transaction is recorded in the nation's external accounts as well as, but with opposite sign, in the corresponding accounts of the non-resident's country. Balance of payments accounting records a nation's international trade in goods, services and assets and is important because it indicates the size and direction of international borrowing. As a summary of all such transactions, the external accounts are a subset of the national accounts and hence are best considered in an international macroeconomic framework.

The 'balance of payments' as such does not refer to the notion of the balance of payments as understood if the exchange rate is fixed. With a fixed exchange rate, the balance of payments is essentially the measure of the change in the central bank's holdings
of foreign exchange reserves. Under the now defunct Bretton Woods system of exchange rate management set up after World War II, balance of payments problems for Australia and other developed countries most often involved unsustainable rundown in official international reserve assets. Such holdings were necessary to maintain the value of the currency in the face of a shortfall between residents' demand for foreign currency arising, for example, as a consequence of the demand for imports, and the supply of foreign currency provided to residents by foreigners as occurred, for example, when exports were sold. Under that system which prevailed for around a quarter of century when international capital markets were far less sophisticated, balance of payments deficits usually arose for current account reasons though there were substantial international capital flows. Nevertheless, availability of central banks' reserves represented the ultimate external constraint on an economy's performance.

In contrast, the present floating exchange rate system which has operated internationally since the early 1970's, and in Australia since 1983, almost by definition does not depend on direct intervention by the monetary authorities to maintain any particular exchange rate. Under the purest of floats, the overall balance of payments should in practice be zero with the exchange rate itself bearing all the pressure of external adjustment. Hence, in what follows the focus will not be the balance of payments as such but the two matching sides of the external accounts, viz. the current account and the capital account.

As we see in the following chapter, the macroeconomic notion of external imbalance was widely employed in the theoretical literature during the fixed exchange rate era, to describe balance of payments situations characterised by either unsustainable rundown or excessive accumulations of foreign currency reserves by the central bank.
However, with the progressive dismantling of capital controls, along with the shift to more flexible exchange rates, the old notion of external imbalance as a reserve constraint lost its former meaning. Nonetheless, the term persists in the literature and in popular usage but now generally refers to current account outcomes. Often, however, the term still conveys the implication that some form of remedial macroeconomic policy action is necessary. However, as will be argued in what follows in later chapters, such an understanding is misplaced under current circumstances. Therefore in this and subsequent chapters, whenever the term external "imbalance" is used in discussing developments under floating exchange rates, it is simply meant to describe the current account outcome, capital account outcome, or net foreign investment position; it is rarely meant to convey a state of macroeconomic disequilibrium begging a policy response.

2.2 Definitions and Accounting Relationships

This section defines the major economic aggregates frequently referred to in the remainder of this thesis and the national and international accounting relationships which link them. A thorough understanding of these preliminaries is important since they form the basis for much of the theoretical and empirical analysis of later chapters.

2.2.1 Absorption, Income and the Current Account

In a closed economy, ex post the value of gross domestic product (Y) equals gross national expenditure. However, in an open economy, total spending by resident households and firms is the absorption of domestically produced goods and services (A), as well as goods and services produced abroad. The difference between residents' spending on domestically produced goods and total absorption is imports (M). Exports
(X) on the other hand, represent foreign spending on domestic product and equal the
difference between national product and residents' spending on locally produced goods and
services. In sum, therefore, \( Y = A + (X - M) \). Accordingly,

\[
Y - A = X - M = T
\]  

(1)

If absorption exceeds output, the net exports balance is in deficit (T).

Another important distinction used subsequently is that between gross domestic
product and national income \((Y_n)\). The difference between these aggregates is due to net
income paid abroad \((y_a)\), the bulk of which is interest and dividends on existing net
external liabilities, and consumption of fixed capital or depreciation allowances \((d)\) such
that \( Y_n = Y - y_a - d \). Further, the national accounting term, national disposable income
\((Y_d)\), is national income less net transfers paid abroad \((t)\). Therefore, \( Y_d = Y_n - t \). The
current account imbalance \((CAB)\) is defined as \( CAB = T + y_a + t \). The CAB recorded in
the external accounts corresponds to the entry net borrowing abroad \((b)\) recorded in the
national accounts except that net borrowing abroad does not include undistributed income
\((u)\) accruing overseas.

The accounting relationships between the aggregates defined above, including gross
domestic product, absorption, the trade balance, national income, national disposable
income, the current account balance and net borrowing abroad are schematically depicted
in Figure 2.1.
### 2.2.2 Saving, Investment and the External Accounts

We can now introduce the intertemporal dimension of national accounting by recognizing that *gross saving* \( S \) is the difference between *gross national product* \( Y \) and *consumption* \( C \) whereas *gross domestic investment* \( I \) is the difference between total absorption and consumption. Hence

\[
(Y - C) - (A - C) = S - I = X - M.
\]

Therefore, when the trade balance is in deficit, not only must imports exceed exports, but gross investment must exceed gross domestic saving.

*Domestic saving* \( S_d \) is defined as the difference between national disposable income \( Y_d \) and consumption. Net domestic investment \( I_d \) is the difference between gross
investment and depreciation allowances. From the above definitions, it follows algebraically that

$$S_d - I_d = X - M - y_t - t = CAB. \quad (2)$$

Technically, consumption of fixed capital (d) is of little concern when focusing on the external imbalance as the saving–investment gap. It is immaterial whether gross or net measures are used to measure external imbalance because from equation (2),

$$CAB = S_d - I_d = (S-d) - (I-d) = S - I.$$ 

Whereas in a closed economy saving must always equal investment ex post, in an open economy the CAB provides a measure of the difference between these aggregates. When there is a current account deficit (CAD), the excess of net domestic investment over saving must be financed by foreign funds or net capital inflow, as measured by net foreign investment (NFI) or the capital account surplus (KAS). Hence an open economy can augment its capital stock (K) through the process of foreign investment. At the same time foreign investment increases the domestic economy's stock of net external financial liabilities. Therefore, the larger is the rise in the nation's capital stock, given the level of domestic saving, or the smaller is domestic saving or the addition to national wealth (W), given the increase in the capital stock, the larger is the CAD. In stock change terms, $dK - dW = KAS = NFI = CAD$ where the stock changes are net of capital gains and losses. Explaining net capital flows therefore also amounts to explaining changes in the stock of real capital goods relative to changes in national wealth levels.

By relying on foreign saving (S*), as manifested in a capital account surplus, investment can therefore be greater than otherwise, for without foreign capital inflow, the level of domestic investment would be constrained by the pool of domestic saving. When foreigners finance expansion of the domestic capital stock, the rise in net external
liabilities or *net international investment position* is therefore matched by an increase in the nation's real assets, although the cost of borrowing from foreigners eventually and sometimes almost immediately appears in the current account as income paid overseas. Income paid overseas can therefore be perceived as the return to foreigners for allowing an economy to expand its capital stock. Figure 2.2 represents the relationships between foreign saving, domestic saving and investment, the *national capital account*, and the external accounts.

A nation's NFI must be matched by a corresponding current account surplus experienced by the rest of the world (CAS*), and this must also equal the rest of the world's capital account deficit (KAD*) against the home economy. Figure 2.3 below depicts the accounting relationships between saving and investment at home and abroad and the international accounts.

Domestic saving (S_d) and net domestic investment (I_d) along with external saving (S') and net investment abroad (I') comprise world saving (S_w) and world investment (I_w). That is,

\[ I_w = I_d + I' = S_w = S_d + S'. \]

Current and capital account imbalances therefore reflect regions' saving and investment patterns. That is,

\[ I_d - S_d = NFI = CAD = KAS = S' - I' = CAS' = KAD'. \]

Only if domestic saving in each region fully finances domestic investment will the external accounts record a zero current or capital account balance. In the figure, this means external balance so defined includes all points on the 45° line.

However, when saving is free to cross international borders, domestic capital formation can be higher for a nation with a NFI whereas abroad capital formation is less than otherwise to the extent of S'.
Figure 2.2 – Saving, Investment and the External Accounts

World Saving

Figure 2.3 – World Saving and Investment
The discussion has so far assumed an economy without a public sector. However, the public sector through its public enterprises provides output and through its spending, taxing and borrowing also contributes significantly to national absorption and the demand for saving in an open economy. Total public absorption (G) is the sum of public consumption (C_g) and public investment (I_g). The budget or public account imbalance provides a measure of the gap between public saving (S_g) (the difference between net tax revenue (T_g) and public consumption expenditure (C_g) and public investment expenditure (I_g). That is, the budget imbalance = T_g - G = (T_g - C_g - I_g) = (S_g - I_g).

Private and public saving add up to domestic saving (S_d) as defined earlier since

$$Y_d - C_p - C_g = S_d = (Y_d - T_g - C_p) + (T_g - C_g) = S_p + S_g.$$  

Since the external account imbalance is the domestic saving–investment imbalance

$$\text{NFI} = \text{KAS} = \text{CAD} = (I_p - S_p) + (I_g - S_g).$$

If the government's overall budget is balanced (S_g = I_g), NFI is solely attributable to the private sector's investment–saving imbalance.

### 2.2.3 Asset Markets and the External Accounts

We can now explicitly introduce asset markets, financial instruments and the financial sector into a more general flow of funds framework. To further integrate the external accounts into the whole economic system and to extend our basic real framework by incorporating asset markets, consider the stylized accounting matrix below. This matrix will be referred to in subsequent chapters outlining the major theoretical approaches to open economy analysis.
The matrix includes firms, households, the government, financial intermediaries and the central bank as the main sectors of the economy and records their economic and financial transactions with the rest of the world. Hence it adds to the earlier schema financial intermediaries (commercial banks and other financial institutions) and the central bank (the Reserve Bank of Australia, RBA) as agents in the macroeconomy. There are seven markets in which all real economic and financial transactions take place (the rows) as well as the six sectors (the columns). All rows and columns must sum to zero according to national and external accounting principles as well as balance sheet constraints.

Summing across the first row, \( I_p - S_p + (I_g - S_g) = \text{CAB}^* \). Hence \((I_p - S_p) + (I_g - S_g) = \text{NFI} = \text{CAD} = \text{KAS}\) if public and private investment exceeds domestic saving as derived in equation (3). The remaining rows show, in simplified form, the various financial markets.

In the second row, changes in sectoral holdings of the money base (consisting of coin, banknotes and cash balances of the banks at the central bank) must reflect ex post changes in financial asset and liability positions. Assets are shown by superscript "+" and liabilities by superscript "-". Assuming neither the government nor foreigners demand domestically issued base money, this row reveals that an increase in the base money supply, as a liability of the RBA, \((dM_r)\) must be matched by a rise in money base held as an asset in the portfolios of firms \((dM_f)\), households \((dM_h)\) and financial intermediaries \((dM_i)\). Hence \(dM_r + dM_h + dM_i = dM_r\).
## Figure 2.4 – Real and Financial Flows in an Open Economy

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>(1) HOUSEHOLDS</th>
<th>(2) FIRMS</th>
<th>(3) GOVERNMENT</th>
<th>(4) FINANCIAL INTERMEDIARIES</th>
<th>(5) CENTRAL BANK</th>
<th>(6) REST OF THE WORLD</th>
<th>TOTAL</th>
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<tbody>
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<td>MARKET</td>
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<tr>
<td>(1) GOODS AND SERVICES</td>
<td>$-S_p$</td>
<td>$I_p$</td>
<td>$(I_g - S_g)$</td>
<td>$-$</td>
<td>$-$</td>
<td>CAB*</td>
<td>0</td>
</tr>
<tr>
<td>(2) MONEY BASE</td>
<td>$dM_h^+$</td>
<td>$dM_t^+$</td>
<td>$-$</td>
<td>$dM_t^+$</td>
<td>$dM_r^-$</td>
<td>$-$</td>
<td>0</td>
</tr>
<tr>
<td>(3) BANK DEPOSITS</td>
<td>$dD_h^+$</td>
<td>$dD_t^+$</td>
<td>$-$</td>
<td>$dD_t^-$</td>
<td>$-$</td>
<td>$dD^+$</td>
<td>0</td>
</tr>
<tr>
<td>(4) BONDS</td>
<td>$dB_h^+$</td>
<td>$dB_t^+$</td>
<td>$dB_g^-$</td>
<td>$dB_t^+$</td>
<td>$dB_r^+$</td>
<td>$dB^+$</td>
<td>0</td>
</tr>
<tr>
<td>(5) EQUITIES</td>
<td>$dE_h^+$</td>
<td>$dE_t^-$</td>
<td>$-$</td>
<td>$-$</td>
<td>$-$</td>
<td>$dE^+$</td>
<td>0</td>
</tr>
<tr>
<td>(6) OTHER DEBT</td>
<td>$dH_h^+$</td>
<td>$dH_t^-$</td>
<td>$-$</td>
<td>$dH_t^+$</td>
<td>$-$</td>
<td>$dH^+$</td>
<td>0</td>
</tr>
<tr>
<td>INSTRUMENTS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) FOREIGN CURRENCY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$dR_f^+$</td>
<td>0</td>
</tr>
<tr>
<td>RESERVES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$dR_r^-$</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
In the third row, a change in demand deposits with financial intermediaries can arise as deposits by households \((dD^*_h)\), firms \((dD^*_f)\) and foreign entities \((dD^*_f)\) in financial intermediaries increase. The increased asset positions of households, firms and foreign entities is matched by a rise in the intermediaries' consolidated liability position such that \(dD^*_f + dD^*_h + dD^*_f = dD^*_f\).

The fourth row simply shows that changes in the growth of Treasury securities on issue, which are the liabilities of the Federal government, must be matched by increased holdings of bonds in the portfolios of the agents in the other five sectors. That is, \(dB^*_h + dB^*_f + dB^*_i + dB^*_f + dB^*_ = dB^*_g\).

Row five reveals that additional capital accumulation by private firms funded through the sale of equities must be absorbed as assets by households \((dE^*_h)\) and foreign investors \((dE^*_f)\). It is assumed that neither financial institutions nor the official sector is permitted to buy shares in domestic enterprises. Hence \(dE^*_f = dE^*_h + dE^*_f\). If the enterprise issuing equities is a subsidiary of a foreign firm and new share issues are exclusively taken up by foreign buyers, then the item \(dE^*_f\) would be classified in the capital account as direct foreign investment in Australia. The distinction between direct and portfolio foreign investment is further discussed shortly.

The other main way of raising financial capital is through borrowing as shown in row six. This form of financing real capital accumulation also appears as a liability of domestic firms, but of course does not provide the lenders of funds with the same legal claim to ownership of domestic firms, as is the case with equity participation.

Firms may borrow either directly from households \((dH^*_h)\) or foreigners \((dH^*_f)\) (for instance, through the issue of company debentures) or alternatively they may borrow indirectly from those sectors through financial intermediaries \((dH^*_f)\). Therefore
\[ dH_t = dH_h + dH_ \] If resident households provide insufficient funds to finance domestically located firms' investment activity, funds will be sought from abroad. Though equity issues are denominated in domestic currency, foreign debt may be denominated in either domestic or foreign currency.

The last row shows the extent of foreign exchange market intervention undertaken by the RBA or the change in the stock of its official reserve assets \( (dR_\) ). Official reserve assets are by and large held in the form of financial assets, previously issued by foreign governments and central banks, but also include gold bullion. Hence \( dR_r = dR_\). Under a fixed exchange system, \( dR_\), as the change in the stock of official reserves, provides a measure of a nation's overall balance of payments position but, as discussed at the beginning of this chapter, this measure of external balance has become redundant.\(^1\) Under the floating exchange rate system presumed throughout the subsequent analysis, this entry in the capital account instead provides a measure of the extent to which the RBA intervenes to prevent appreciation or perhaps induce depreciation of the exchange rate.

Next we turn to the columns of the matrix which present the budget constraints of all six sectors. In column one, households dispose of their saving by increasing holdings of cash balances, \( (dM_h) \), cash deposits \( (dD_h) \), bonds \( (dB_h) \), equities \( (dE_h) \) and interest bearing securities \( (dH_h) \). The total increase is the change in household wealth \( (dW_h) \). So \[ S_p = dM_h + dD_h + dB_h + dE_h + dH_h = dW_h. \]

\(^1\) In practice, apart from official intervention, the domestic currency value of official reserves may also be affected by exchange rate movements and gold price fluctuations. However, as with all other entries in this flow of funds framework, the change in reserves item abstracts from such capital gains and losses.
Firms (column two) produce goods and services for sale in markets and finance additional net capital accumulation by issuing securities as claims in the form of equities \((dE_f)\) and debt \((dH_f)\) or by running down cash balances \((dM_i)\) and bank deposits \((dD_i)\), or by selling bond holdings \((dB_f)\).\(^2\) The total increase is the change in the capital stock of enterprises, \(dK_p\). Hence \(I_p = dE_f + dH_f - dM_i - dD_i - dB_i = dK_p\).

Column three is the government's budget constraint. The government sector includes "departments of State" or similar entities of Federal, State and local governments, but in practice excludes public sector business enterprises which are usually grouped with private firms for data collection purposes. If there is a budget deficit, there is an excess of government investment spending \((I_g)\) over public saving \((S_g)\), and this deficit is financed by issuing Treasury bonds. The government's net financing requirement is therefore \(dB_g = I_g - S_g\).

The financial sector (column four) includes licensed trading, saving and development banks and non-bank financial institutions which incur liabilities and acquire financial assets. For financial intermediaries, the budget constraint is \(dM_i + dB_i + dH_i = dD_i\) which states that changes in this sector's holdings of cash reserves \((dM_i)\), bonds \((dB_i)\) and its consolidated loan position \((dH_i)\), all recorded on the credit side of the balance sheet, are equivalent to the change in deposits \((dD_i)\), recorded on the debit side.

\(^2\) For expositional purposes, we assume here that private households save and private and public enterprises invest. However, in practice household expenditure on private dwellings is a significant component of private investment and retained earnings and undistributed income of enterprises comprise part of measured saving.
The fifth column is the central bank's budget constraint. It shows that the supply of base money can only be increased \((dM_r)\) through RBA open market purchases of bonds \((dB_r)\) or by purchases of foreign exchange or securities in the foreign exchange market. Hence foreign exchange market intervention has monetary consequences and may therefore be undertaken by the RBA as a means of expanding or contracting the money supply for macroeconomic stabilisation purposes. However, if influencing the exchange rate is the sole objective of intervention \((dR_r)\), the change in the money base \((dM_r)\) must be offset, or sterilized, through open market operations by an equivalent change in the central bank's bond holdings \((dB_r)\). For instance, if the central bank buys foreign exchange to prevent appreciation of the exchange rate, it must simultaneously sell Treasury bonds from its portfolio to prevent an unintended monetary expansion.

Finally, the sixth column shows the composition of net capital inflow from the perspective of the rest of the world, classified by financial instruments. Under a pure float, there is no central bank intervention in the foreign exchange market, so \(dR_r = dR_r = 0\). As shown previously the rest of the world's net capital outflow is equivalent to the domestic economy's CAD or NFI.

NFI therefore arises because foreigners use their surplus saving to purchase equities \((dE_r)\) and debt instruments \((dH_r)\) issued by domestic firms, bonds \((dB_r)\) issued by the government and by depositing funds with financial institutions \((dD_r)\). Hence \(NFI = dE_r + dH_r + dB_r + dD_r\). If the exchange rate is fixed or if the central bank intervenes in the foreign exchange markets, the change recorded in the stock of official reserve assets \((dR_r)\) also changes the liability position of the rest of the world \((dR_r)\). Any rundown of reserves which may be the result of a central bank strategy to appreciate the
currency, or prevent it from depreciating, therefore augments the existing capital inflow which is financing the nation's CAD.

If the government's budget is balanced \((I_g - S_g = dB_g = 0)\) and there is a pure float \((dR_r = dR_e = 0)\), it follows from the matrix that foreigners finance, through purchases of domestic equity, debt instruments and bank deposits, that much more private domestic capital accumulation i.e. \(dD_r + dE_r + dH_r = dK_p\).

A further distinction drawn about NFI is that between portfolio investment and direct investment. Portfolio or indirect investment refers to ordinary foreign purchases of domestic debt or equity claims whereas direct foreign investment includes investment which suggests significant foreign control over the management of resident firms and their real assets including subsidiaries of foreign firms. For measurement purposes, foreign ownership of at least ten percent of ordinary shares or equivalent equity interest in an enterprise is defined as constituting significant influence. Schematically, the distinction is as shown in Figure 2.5.

Taken as a whole, a nation's international transactions must always balance. Under a float, exchange rates move to eliminate any excess demand or supply of currencies on the foreign exchange market whereas the central bank does this through intervention when exchange rates are managed. If some force tends to raise or lower the balance in one category of external transactions a process is automatically set in motion which leads to an offset in other categories.
For example, if there is a surge in foreign demand for Australian financial assets, the additional foreign investment will raise the capital account surplus which may strengthen the exchange rate and worsen the trade balance. Similarly, a surge in foreign demand for Australian goods would raise the value of credits recorded in the current account. To the extent that this strengthens the currency and national income, higher merchandise imports would raise current account debits. In sum, the current and capital account imbalances are jointly determined at the point where the net demand for foreign funds on one side matches the net supply on the other with the exchange rate proximately performing the equilibrating role.
2.3 Measurement Issues

Having defined the external accounts within the framework of the system of national sectoral accounts, we now consider actual measures of the major macroeconomic variables which will form the basis for subsequent discussion of Australia's external accounts in the 1970's and 1980's.

2.3.1 Australian Data

The current and capital sides of Australia's external accounts proper are presented in Table A.2.1 of the Appendix. This raw data reveals that the current account was persistently in deficit over recent decades, the only surplus being recorded in 1972–73. Nonetheless, within the current account, some distinct compositional changes occurred between the 1970's and 1980's. For instance, the merchandise trade balance which had been in surplus throughout the 1970's turned to substantial deficit in the early 1980's and remained in deficit throughout the 1980's except for relatively small surpluses in 1983–84 and 1987–88. Another noteworthy feature of the official current account data was the sharp increase in the net income deficit component from the mid 1980's due to rising interest payments on previously incurred foreign debt.

Surpluses on the capital account matched the persistent CAD's of the 1970's and 1980's with the exception of two relatively small capital account deficits in 1971–72 and 1972–73. In general, the capital account was not disaggregated to the same extent as the current account over the two decades. This is especially so for the 1970's when capital transactions were severely limited by a range of exchange controls and were probably considered less important for measurement purposes. Nonetheless, the available capital account data does reveal that official borrowing by the general government sector,
including by the RBA, varied considerably on a year-to-year basis throughout the entire period, whereas net non-official capital inflow increased markedly only from the late 1970's onwards.

The balancing item, shown outside the capital account balance, represents the statistical difference between measures of current account components and measures of asset purchases and sales which determine the capital account. In practice, the balancing item forces a numerical equivalence between the current and capital accounts because the two sides must be the same in principle. This entry, as evident from the table, is often large and arises because data from different sources differs in scope, accuracy and timing. The absolute value of the balancing item rose very significantly in the 1980's averaging around 18 percent of the CAD and was highest in the late 1980's, reaching a record 38 percent of the CAD in 1989-90. Moreover, the balancing item has usually been positive, suggesting that it most likely reflects missed capital inflow.

The official stock data corresponding to the flows recorded on the capital side of the external accounts, gives rise to the nation's net international investment position. The key aspects of these data, also shown in the Appendix (Table A.2.2), will be described more fully in the subsequent discussion of stylized facts about the open Australian economy.

As we have seen, the external accounts are related to the broader system of national accounts (SNA), through the output-expenditure and saving-investment identities. The domestic saving and investment aggregates along with net borrowing abroad comprise the nation's capital account, which is presented in Table A.2.3. These measures correspond to the last three columns of the earlier Figure 2.2.
Official measures of national output and expenditure data, related to the first two columns of Figure 2.1, from which the capital account data are ultimately derived, are shown in Table A.2.4. The item *increase in stocks* can be considered part of gross investment expenditure and will usually be treated as such in later theoretical and empirical analysis.

The *statistical discrepancy* item in the national accounts is defined as the measured difference between the independent statistical estimates made by the Australian Bureau of Statistics (ABS) of columns 1 and 2 of Figure 2.1. The statistical discrepancy (sd) ensures that measured aggregate expenditure equals measured output. That is

\[ Y = C_p + C_g + I_p + I_g + (X - M) + \text{sd}. \]

Using the same algebraic method employed to derive equation (3) above, it can easily be shown from this expression including sd that the \( \text{CAB} = (I_p + I_g) - (S_p + S_g) + \text{sd}. \)

For completeness, official data from the nation's income and outlay account are also reproduced in Table A.2.5. This table includes estimates of the income aggregates defined in Figure 2.1 and also reveals the breakdown of domestic factor incomes (net of consumption of fixed capital) as between returns to labour (*wages, salaries, supplements*) and to all other factors, notably capital and land, involved in the production process (*net operating surplus*).

Outlays and receipts data for the general government sector, which consolidates the budgets of Federal, State and local governments in Australia, are in Table A.2.6. This table excludes outlays and receipts of public enterprises operating on a commercial basis.

Although in principle the current account, capital account and saving–investment imbalances should essentially be the same, in practice measurement differences give rise to alternative external imbalance series. First, the CAD differs from the KAS or NFI to
the extent of the balancing item from the external accounts proper. Second, any measure of the difference between official national accounts estimates of domestic saving and investment will diverge from the CAD and NFI because of the statistical discrepancy from the national accounts. Third, net borrowing abroad (or use of foreign saving) recorded in the national capital account differs from the CAD to the extent of undistributed income of enterprises whose head offices are located offshore.

These measurement anomalies effectively yield four different measures of "external imbalance". These are (i) the official measures of the CAD and (ii) the official measure of the KAS (or NFI), both from the external accounts proper; (iii) net borrowing abroad (or use of foreign saving) from the national capital account; and (iv) the residual derived from the national accounts by subtracting domestic investment from domestic saving which includes the statistical discrepancy. These alternative flow measures of the external position are shown in Chart 2.1.

In later chapters, the external imbalance will mainly be referred to and interpreted as a nation's domestic saving–investment imbalance. The actual size of Australia's saving–investment gap throughout the 1970's and 1980's is depicted in nominal terms in Chart 2.2. As a proportion of GDP, the external imbalance is therefore the vertical distance between aggregate saving and investment, corresponding empirically to measure (iv).

Official flow of funds or net lending by sector data, which are compatible with national capital account data, are the statistical counterpart of the aggregate financial elements of the matrix presented in Figure 2.4. Net borrowing and lending by sector as a proportion of GDP is shown in Chart 2.3, the bottom panel of which again depicts the extent of the external imbalance.
CHART 2.1 - ALTERNATIVE FLOW MEASURES OF THE EXTERNAL POSITION
CHART 2.2 - SAVING, INVESTMENT AND NFI
CHART 2.3 - SECTORAL BALANCES

BORROWING (-) / LENDING (+)
PER CENT TO GDP

-5 -4 -3 -2 -1 0 1 2 3 4 5

NON-FINANCIAL CORPORATE TRADING ENTERPRISES

HOUSEHOLDS

-5 -4 -3 -2 -1 0 1 2 3 4

GOVERNMENT

-5 -4 -3 -2 -1 0 1 2 3 4

FINANCIAL SECTOR (INCL. BAL. ITEM)

-5 -4 -3 -2 -1 0 1 2 3 4 5

REST OF WORLD

78/79 80/81 82/83 84/85 86/87 88/89

2.3.2 Valuation Effects

In the foregoing discussion of the value of the balances in the external accounts, it was implicitly assumed that it was appropriate to measure external imbalances in Australian dollar terms. However, there are valuation effects particularly on trade flows and servicing of foreign debt, which arise because of movements in the exchange rate. (See also Arndt and Dorrance (1987)). To provide a hypothetical example of this phenomenon, focussing on the trade balance, assume imports were $200m and exports $100m. The trade deficit would therefore be $100m. However, after a 50 percent depreciation, import and export prices would rise by the same percentage amount and the trade deficit would become $150m, all other things constant. This valuation effect, sometimes referred to as a 'J curve' effect, is to some extent an arithmetic illusion due to the fact that following a currency depreciation, import values are affected by more in domestic currency terms than export values when starting from a trade deficit.

Such valuation effects suggest that a foreign currency measure of the imbalance may for some purposes provide a more meaningful measure of trends, particularly if we are concerned with the extent of capital flows from a foreign perspective, which is how column six of the real and financial flows matrix (Figure 2.4) is actually presented. For instance, if a reason for concern about an ever increasing CAD, as officially measured, is its effect on the sentiment of foreign investors themselves, or if it is necessary to gauge the extent of foreign currency saving being exchanged for Australian assets, it seems logical to present the external imbalance in terms of foreign currency thereby largely abstracting from the exchange rate valuation effect.
Chart 2.4 compares the official Australian dollar measure of the CAD with foreign exchange measures revealing a significant variation between the Australian dollar, United States dollar and Trade Weighted Index measures. The divergence becomes particularly significant after the floating of the Australian dollar in December 1983 which marked the beginning of a period characterised by large exchange rate swings.

Abstracting from this valuation effect to put Australia's changing external account position throughout the 1970's and 1980's in international perspective, Chart 2.5, based on IMF data, compares Australia's measured CAB (expressed in US dollars as the common currency and as a proportion of GDP) with the CAB's of countries which were major sources of Australia's foreign saving. From this chart, it is evident that the widening of Australia's CAD in the early 1980's occurred as the Japanese and German CAB's tended to increased surpluses. The early 1980's also marked turning points in the external account positions of the United States and United Kingdom, which both began the decade with CAS's and ended with CAD's, though the US and UK CAD's were significantly less than Australia's in relation to GDP.

As pointed out by Sinn (1990, p. 52) there is a further measurement anomaly caused by exchange rate movements. In principle, the CAD should equal the change in the net international investment position but exchange rate changes may affect the flow and corresponding stock aggregates quite differently because of the currency composition of transactions. Suppose for instance that Australia's net international investment position was $A150 billion, the CAD was $A20 billion and half of all current and capital transactions were denominated in United States dollars. Following a fifty percent depreciation of the Australian dollar against the United States dollar, the net international investment position measured in Australian dollars would rise by $37.5 billion to
AUSTRALIA AND JAPAN
THE CAB AS A PERCENTAGE OF GDP


AUSTRALIA YEAR + JAPAN

AUSTRALIA AND U.K.
THE CAB AS A PERCENTAGE OF GDP


AUSTRALIA YEAR + U.K.

CHART 2.5 – CURRENT ACCOUNT BALANCES: AUSTRALIA vs JAPAN, USA, UK AND GERMANY
$187.5 billion [i.e. (0.5 x 150 x 1.5) + (0.5 x 150)] whereas the CAD would only rise by $5 billion to $25 billion [i.e. (0.5 x 20 x 1.5) + (0.5 x 20)]. Hence, given a similar composition of currency transactions for each sub-account, the increase in external liabilities in this example far exceeds the corresponding increase in the CAD.

2.3.3 Inflation Adjustment of Sectoral Balances

The External Sector

Unlike other macroeconomic variables such as the national accounting aggregates, wages, the money supply, interest rates and exchange rates, external accounts data is not usually adjusted for the distortionary effects of domestic inflation which is surprising in view of the recent emphasis in the literature on inflation adjustment issues (See Eisner and Pieper (1984), Eisner (1988, 1989) and Barro (1990)).

This section firstly outlines a method for adjusting CAB's for domestic inflation and then applies it to the Australian data. Few other OECD countries provide as much information in their external accounts on the composition, source, destination and currency of denomination of capital flows. Further, compared to the Group of Seven (G7) economies, Australia has recorded relatively large external imbalances as a proportion of its GDP over this time, while experiencing comparatively high inflation, as evident from Chart 2.6.

Australia's annual average inflation rate in the 1970's was, at 9.8 percent, slightly higher and more volatile than the OECD average of 8.7 percent. In the 1980's, Australia's average inflation performance improved slightly to 8.2 percent, but did not fall to the same extent as in most other OECD economies, as indicated by an OECD average of 5.7 percent for the same period.
The counterpart of a CAB over any time period should in principle equal an ex post change in financial liabilities to the rest of the world which can take the form of either interest bearing liabilities or equities. Hence a comprehensive set of external accounts is concerned with stocks as well as flows and therefore records the balance of financial indebtedness as well as payments.
From a supply of funds perspective, there is of course no a priori reason for accepting that debt is any less useful a form of finance than equity and just as foreign debt requires servicing through interest payments, foreign equity capital must be serviced eventually through dividend payments. Nonetheless, foreign debt and equity obligations can be denominated in different currencies. Most foreign debt is valued in foreign currency (See Table 2.1), whereas equities issued by local enterprises, yet purchased by foreigners, are denominated in domestic currency.

Table 2.1  Currency Composition of Gross Foreign Debt (Percentage Shares)

<table>
<thead>
<tr>
<th>As at end-June</th>
<th>$US</th>
<th>Stg</th>
<th>SF</th>
<th>DM</th>
<th>Yen</th>
<th>Other</th>
<th>All</th>
<th>$A</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>51.9</td>
<td>3.3</td>
<td>6.4</td>
<td>9.1</td>
<td>7.0</td>
<td>7.7</td>
<td>85.5</td>
<td>14.5</td>
<td>100.0</td>
</tr>
<tr>
<td>1982</td>
<td>56.3</td>
<td>3.1</td>
<td>7.7</td>
<td>6.9</td>
<td>4.9</td>
<td>8.1</td>
<td>87.1</td>
<td>12.9</td>
<td>100.0</td>
</tr>
<tr>
<td>1983</td>
<td>56.3</td>
<td>3.4</td>
<td>6.6</td>
<td>5.6</td>
<td>4.8</td>
<td>8.2</td>
<td>85.0</td>
<td>15.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1984</td>
<td>59.1</td>
<td>3.3</td>
<td>5.8</td>
<td>4.1</td>
<td>3.6</td>
<td>7.6</td>
<td>83.5</td>
<td>16.5</td>
<td>100.0</td>
</tr>
<tr>
<td>1985</td>
<td>55.1</td>
<td>2.7</td>
<td>6.0</td>
<td>3.2</td>
<td>7.3</td>
<td>6.7</td>
<td>81.1</td>
<td>18.9</td>
<td>100.0</td>
</tr>
<tr>
<td>1986</td>
<td>49.4</td>
<td>3.3</td>
<td>5.8</td>
<td>3.7</td>
<td>9.9</td>
<td>4.9</td>
<td>77.0</td>
<td>23.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1987</td>
<td>47.0</td>
<td>3.9</td>
<td>4.9</td>
<td>3.6</td>
<td>9.7</td>
<td>5.1</td>
<td>75.1</td>
<td>24.9</td>
<td>100.0</td>
</tr>
<tr>
<td>1988</td>
<td>38.2</td>
<td>4.6</td>
<td>4.7</td>
<td>2.5</td>
<td>11.0</td>
<td>7.1</td>
<td>68.0</td>
<td>32.0</td>
<td>100.0</td>
</tr>
<tr>
<td>1989</td>
<td>40.6</td>
<td>3.1</td>
<td>3.2</td>
<td>2.1</td>
<td>8.2</td>
<td>4.6</td>
<td>61.8</td>
<td>38.2</td>
<td>100.0</td>
</tr>
<tr>
<td>1990</td>
<td>35.5</td>
<td>1.6</td>
<td>2.4</td>
<td>1.5</td>
<td>9.5</td>
<td>8.2</td>
<td>58.7</td>
<td>41.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: ABS, Cat.5305.0.

Though a CAB is matched by a change in a country's net financial liability position, according to international convention, the balance of payments accounts
measured in domestic currency should also exclude any capital gains or losses arising from movements in the market value of financial claims.

As shown in Table A.2.1 in the Appendix, measured CAB's are comprised of goods and services trade imbalances plus net income payments including interest, and dividends, paid on outstanding foreign liabilities, labour income and other net unrequited transfers including pensions and foreign aid. When in deficit, CAB's should be matched on the capital side of the external accounts by growth in the nominal domestic value of the external liabilities of all domestic sectors, exclusive of market determined capital gains and losses on financial claims.

Hence,

\[ T + (i_t + s) eF + i_h H + lE + t = \frac{d}{dt}(H + eF + E) \]  

where \( T \) is the trade balance, \( i_t \) is the nominal interest rate on foreign currency denominated external debt, \( F \), \( i_h \) is the nominal interest rate paid on home currency denominated external debt, \( H \), \( e \) is the effective exchange rate, \( l \) is the dividend rate on foreign owned equities, \( E \), \( s \) is the exchange rate depreciation, \( \frac{de}{dt} / e \), and \( t \) is other transfers.

In an inflationary environment, for a country with net external liabilities the real value or burden of these foreign obligations denominated in home currency falls at a rate equal to the domestic inflation rate and, consistent with the Fisher real interest rate effect, part of annual interest payments effectively compensates lenders for the erosion in the value of their principal. Hence the inflation segment of interest received is not really additional income earned by creditors. Yet, under existing external accounting procedures,
all interest actually paid to foreigners appears in the current account when that part
attributable to inflation should in fact be recorded in the capital account.

For a debtor nation, although domestic inflation still erodes the burden of net
external liabilities denominated in foreign currency, exchange rate depreciation augments
it. Therefore, over any period, the real change in the value of external obligations
invoiced in foreign currency is the nominal change less inflation plus depreciation. Of
course if relative purchasing power parity happened to hold instantaneously, from the
viewpoint of domestic borrowers, currency depreciation would then keep constant the real
servicing costs on foreign debt. However, the significant real exchange rate appreciations
and depreciations evident for the major currencies over recent decades mean short run
deviations from PPP are common. None of the accounting or empirical content of what
follows immediately depends on the assumption of either absolute or relative PPP.

More formally, if we evaluate the change in the deflated stock of an economy's
outstanding external liabilities, we obtain

$$\frac{d}{dt} \left( \frac{H + eF + E}{P} \right) = \frac{(\frac{dH}{dt} + seF + eF)}{(\frac{dF}{dt} + \frac{dE}{dt})P - (H + eF + E)\frac{dP}{dt}}$$

$$= \frac{(\frac{dH}{dt} + seF + eF)}{(\frac{dF}{dt} + \frac{dE}{dt})P - (H + eF + E)\pi}$$

(5)

(Where $\pi$ is the rate of domestic inflation, $\frac{dP}{dt}$)
Substituting (4) into (5),

\[
\frac{d}{dt} \frac{H + eF + E}{P} = \frac{(T + i_F + i_H + i_E + i_t) - (H + eF + E)\pi}{P}
\]

\[
= \frac{(T + t)}{P} + (i_s - \pi)\frac{H}{P} + (i_t - \pi)\frac{eF}{P} + (1 - \pi)\frac{E}{P} = \text{Real CAB}
\]

According to equation (6) above, the real CAB is simply the trade and transfers balance deflated by the price level plus the real servicing costs on total external obligations, similarly deflated. This specification provides a basis for estimating Australia’s inflation adjusted external imbalance.

Implicit nominal interest rates on foreign debt for any year can be estimated by dividing net interest payments abroad by a weighted measure of net debt outstanding when both are expressed in the domestic currency. Similarly, the implicit cost of foreign equity capital can be derived by dividing actual dividends paid by the average stock of foreign owned equities. The calculations exclude unremitted profits and the effects of capital gains and losses on equity values. Ex post, the real servicing cost of either form of foreign capital is approximately the nominal rate less the domestic inflation rate. In aggregate of course, the real effective cost of foreign capital may be estimated as the ratio of the total domestic currency value of net interest, dividends and other profit remittances paid aboard to average net external liabilities over the period, less the inflation rate.

Using this approach, Table 2.2 below illustrates the significant differences which have arisen between Australia’s nominal and inflation adjusted imbalances.

\[\text{More accurately, the real servicing cost on either foreign debt or foreign equity holdings is } \frac{1 + \text{implicit rate}}{1 + \Pi} - 1.\]
### Table 2.2 Nominal vs Real CAB ($A m$

<table>
<thead>
<tr>
<th>Year</th>
<th>$T/P$ (a)</th>
<th>$t/P$ (b)</th>
<th>Implicit Cost of Borrowing (c)</th>
<th>$\pi$ (d)</th>
<th>Real Cost of Borrowing</th>
<th>$\frac{H+eF+E}{P}$ (e)</th>
<th>Real CAB</th>
<th>$\frac{Real CAB}{Real GDP}$</th>
<th>CAB</th>
<th>$\frac{CAB}{GDP}$</th>
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<tr>
<td>1980-81</td>
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<td>17.7</td>
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<td>1983-84</td>
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<td>7.0</td>
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<td>1985-86</td>
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<td>1986-87</td>
<td>1103</td>
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<td>1.2</td>
<td>85678</td>
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<td>1988-89</td>
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<tr>
<td>1989-90</td>
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<td>106609</td>
<td>-14603</td>
<td>-5.6</td>
<td>-21153</td>
<td>-5.7</td>
</tr>
</tbody>
</table>

**Notes:**

(a) The real trade deficit is the value in 1984/85 prices of exports of goods and services less imports of goods and services

(b) The transfers balance is mainly the difference between credits and debits for labour, and unrequited transfers

(c) The implicit cost of borrowing is the difference between credits and debits for interest, dividends and profit remittances, divided by the stock of net external liabilities. The stock of net external liabilities is a weighted average where the weighting used is two-thirds for levels at the beginning of the year plus one-third for levels at the end of the year. The values for equities were adjusted for capital gains and losses which occurred during the year.

(d) The inflation rate is the change in the implicit price deflator for GDP

(e) The real stock of external liabilities is a weighted average of net financial liabilities less financial assets with the same weights as explained in note (c) above.

**Data Sources:**

ABS, *Foreign Investment Australia*, Cat. 5305.0 (various), ABS, *Balance of Payments Australia*, Cat. 5302.0 (various).
The inflation adjusted external imbalance estimates a given imbalance as it would be if inflation were zero and other things were unchanged. A CAD at a zero inflation rate will be lower than the measured deficit at a high inflation rate. A lower inflation rate automatically means a lower adjusted CAD since, in an inflationary environment, part of the nominal income payments made to foreigners in the form of profit remittances, interest and dividends and shown in the current account, effectively represent repayment of capital and should be offset against recorded foreign investment in the capital account.

Inflation adjusted measures of external imbalance can indicate the extent of the real transfer of capital which takes place between current account surplus and current account deficit nations. Essentially, the transfer process itself involves foreign borrowing, recorded of course in the capital account of the debtor country, being reflected in an overall deficit on the current account due to higher imports of investment goods or higher imports of consumption goods which allow the release of real resources for domestic capital production.

The Public Sector

Inflation also distorts the public accounts. Hence, like the external account imbalance, the budget imbalance and the associated change in the public debt are also best considered in real terms. The Federal budget imbalance in Australia is usually perceived as the main indicator of the stance of fiscal policy since the Federal component of the general government budget covers a large share of total fiscal activity. To inflation adjust the Federal budget, we can use a methodology which parallels that used to inflation adjust the external accounts.
In the absence of inflation, nominal and real budget outcomes for a closed economy have the same numerical value and are the accounting equivalents of changes in the nominal and real stocks of public debt over time. In an inflationary environment, however, the real purchasing power embodied in public debt held as an asset by bond holders and as a liability of the government falls. Any net decrease (increase) in the inflation-adjusted stock of public debt can be thought of as a measure of the "real" budget surplus (deficit) over that time, such a measure being in the spirit of the Haig–Hicks definition of income as the amount of additional expenditure that can be made without changing net indebtedness or the levels of wealth.

An unchanged stock of real public debt means a balanced real budget as a simple numerical example should make clear. If for instance the stock of public debt was one billion dollars, inflation was ten percent and the budget deficit was one hundred million dollars, the level of real public debt would remain the same since inflation has reduced the purchasing power value of the debt to the same extent as the nominal budget deficit has increased it.

Through the Fisher interest rate effect, taxpayers effectively pay off the public debt through the inflation premium included in the nominal interest rate. From a portfolio perspective, such transfers are compensation for inflation and represent principal repayments to preserve the capital value of bonds to asset holders. In effect, rising public debt interest payments caused by inflation are no less inflation-adjusted transfer payments than, say, indexed pensions; in both cases recipients are insulated from any erosion of the purchasing power of their taxpayer sourced income.
Inflation–adjusted fiscal imbalances eliminate money illusion with respect to perceived financial wealth levels. By effectively adding the so called "inflation tax" on bondholdings to budget revenues, real surpluses (deficits) measure the extent to which real government spending or income transfers including tax cuts could have been increased (decreased) without changing the real value of public debt held in private portfolios. The measure is relevant because portfolio allocation decisions can be an important determinant of private capital accumulation and hence the future productivity of the economy.

In an open economy, when Federal outlays exceed revenue, external debt as well as public debt rises if foreigners either purchase securities issued abroad in foreign currency or securities previously issued at home in domestic currency. When part of the public debt is denominated in foreign currency, though domestic inflation still reduces its value, exchange rate depreciation raises it. Again, if purchasing power parity was maintained, the real value of foreign sourced public debt would be the same in domestic currency terms since depreciation would exactly offset inflation differentials. But since purchasing power parity does not hold up well over shorter periods, as evidenced by sharp fluctuations in the real exchange rate, it is necessary to reduce the foreign currency denominated component of public debt when real currency appreciations occur and vice versa.

To actually measure the real public account imbalance for a financially open economy, it is important to note that ex post, any change in the nominal domestic currency value of public debt must equal the primary public account imbalance (defined as non–interest outlays less revenue), plus public debt interest. Putting this more formally,

$$\frac{d}{dt} (H_g + eF_g) = B + i_g H_g + r_g eF_g + seF_g$$

(7)
where $H_g$ is nominal home currency denominated public debt, $F_g$ is nominal foreign currency denominated public debt, $B$ is the primary public account imbalance, $i_g$ is the average interest rate paid on $H$ and $r_g$ is the average interest rate paid on $F$.

Deflating by the price level ($P$) the change in real public debt,

$$
\frac{d}{dt} \left( \frac{H_g + eF_g}{P} \right) = \frac{(dH_g/dt + s eF_g + e dF_g/dt)P - (H_g + eF_g) dP/dt}{P^2}
$$

$$
= \frac{(dH_g/dt + s eF_g + e dF_g/dt) - (H_g + eF_g) \pi}{P}
$$

(8)

(where $\pi$ is inflation, $dP/dt$)

Substituting

$$
\frac{d}{dt} \left( \frac{H_g + eF_g}{P} \right) = \frac{(B + i_g H_g + r_g eF_g + s eF_g) - (H_g + eF_g) \pi}{P}
$$

$$
= \frac{B}{P} + (i_g - \pi) \frac{H_g}{P} + (r_g - \pi + s) \frac{eF_g}{P}
$$

(9)

The real budget imbalance is therefore the sum of the primary part of the public account imbalance, deflated by the price level, as well as the real costs of servicing total public debt outstanding. The servicing cost on public debt previously issued in domestic currency can be measured by simply applying the real interest rate to public debt whereas the servicing cost on foreign currency denominated debt is additionally influenced by exchange rate movements.
Inflation adjusted Federal budget outcomes for Australia are shown in Table 2.3 below based on equation (9) and a methodology similar to that used for the external accounts. Australia's real Federal budget imbalance as a proportion of real GDP has been consistently above the nominal imbalance as a proportion of nominal GDP and surprisingly, contrary to the performance of the nominal account, was actually in surplus over the period at the beginning of the 1980's. More recently, the real measure recorded a surplus in 1986-87, a year before the first nominal surplus in thirty five years.

<table>
<thead>
<tr>
<th>Real Outcome</th>
<th>Real Outcome</th>
<th>Nominal Outcome</th>
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<tr>
<td>Real GDP</td>
<td>Nominal GDP</td>
<td>Real GDP</td>
<td>Nominal GDP</td>
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<tr>
<td>1980–81</td>
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<tr>
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<tr>
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<tr>
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<td>7867</td>
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<td>5899</td>
</tr>
<tr>
<td>1989–90</td>
<td>10043</td>
<td>3.9</td>
<td>9122</td>
</tr>
</tbody>
</table>

Data Sources: RBA Bulletin (various), The Treasury Budget Statements (various)

Other things equal, a tightening of the Federal fiscal stance should move both the nominal and real budget imbalances toward greater surplus, although as the simple balanced budget multiplier concept reminds us, the impact on the level of economic activity depends on whether government expenditure or income transfers of one form or another change. For instance, if public expenditure was cut by as much as welfare
payments were boosted, the economy-wide impact would ultimately be contractionary, even though the absolute nominal and real budget imbalances would stay the same.

Government receipts (particularly income taxes and to a much lesser extent sales tax, excise tax and customs revenue) vary directly with the level of economic activity while government transfer payments, (especially unemployment benefits) vary inversely on the other side of the account. So, since the economy itself influences budget outcomes as well as the other way around, public sector imbalances could be further adjusted to abstract from cyclical influences, notwithstanding the measurement problems potential or "full employment" output raise.

In Australia, the overall fiscal stance is largely determined by the Federal Government, as reflected in the nominal and inflation-adjusted Federal Budget imbalance derived earlier. However, public saving and public investment are also influenced by the fiscal activity of other levels of government, as well as by cyclical influences. Nevile (1991), in a study of the effects of inflation on the consolidated public sector accounts, confirms that the fiscal stance of the general government sector largely followed the Federal Government's. Edey and Britten-Jones (1990) and Ackland (1991) have also since provided inflation-adjusted estimates for the consolidated national public account.

The Private Sector

Inflation adjustment of the external and public account balances has direct implications for private sector saving. The inflation-adjusted external imbalance as a proportion of GDP was, as we have seen for the 1980's some 2 percent less than the actual measure, because net capital inflow was effectively overrecorded. Therefore, measured
domestic saving, comprising both private and public saving must be similarly understated for given gross investment.

The private sector in Australia is in a net debtor position vis-a-vis the foreign sector on account of its external liabilities, but is in a net creditor position vis-a-vis the public sector because of its public debt holdings. Therefore inflation adjustment of the external account should raise private saving but inflation adjustment of the consolidated public account should lower it. In their major study of saving in Australia, Edey and Britten-Jones (1990) argue that the redistribution effect stemming from the private sector's external debtor position can be ignored and is easily outweighed by the opposite redistribution effect due to its creditor position against the public sector.

Access (1992) has attempted to incorporate both redistributive effects on private sector saving, using a methodology which assumed uncovered interest parity. The Access estimates confirm that the external redistributive effect has relatively little impact on the overall pattern of gross private saving in the 1970's and 1980's. In view of this and the lack of strong empirical support for uncovered interest parity (to be discussed in more depth in Chapter 5), we will rely on the inflation-adjusted series for private and public sector saving estimated by Edey and Britten-Jones. The actual behaviour of private and public sector saving is described in the following section on stylized facts about the open Australian economy in the 1970's and 1980's.

2.4 Stylized Facts About the Open Australian Economy

A major purpose of this thesis is to consider the causes and consequences of the widening of Australia's external account imbalance in the 1980's synonymously perceived as growth in foreign borrowing, the CAD, the KAS or NFI. To motivate later theoretical
and empirical interpretation, presented below are some stylized facts about Australia's international macroeconomic performance, with special emphasis on the nexus between national and international capital transactions.

1. **There was a significant increase in Australia's external imbalance in both nominal and inflation adjusted terms in the 1980's compared to the 1970's.**

   In nominal terms, the CAD as a proportion of GDP rose from an average of 1.8 percent in the 1970's to 4.8 percent in the 1980's. The difference between Australia's nominal and inflation-adjusted CAD is shown in Chart 2.7, based on data from Table 2.1 whereas Chapter 2.8 shows that the real external imbalance is not simply the same as the nominal imbalance deflated by the price level. Clearly, the adjusted measure of external imbalance was significantly and persistently lower than the actual values because recorded capital inflow was effectively overestimated under inflationary conditions. Australia's inflation-adjusted imbalance averaged around 2.7 percent as a proportion of real GDP for the period 1980–81 to 1989–90, just over half the corresponding nominal imbalance to nominal GDP proportion over the same period. Interestingly, the corrected imbalance almost reached balance at the height of a perceived balance of payments crisis in Australia in 1986–87.

   Data limitations unfortunately preclude a reliable comparison of the real external imbalance for the 1970's against outcomes for the 1980's. The main limitation arises because stock estimates of foreign equity claims, central to the inflation-adjustment methodology, are inconsistently valued as between the 1970's and 1980's. Before 1980–81, equity holdings were valued at book, rather than market value, causing a sharp break in the equity series after that year.
CHART 2.7 – REAL AND NOMINAL CAB’S
CHART 2.8 - INFLATION-ADJUSTED VS DEFLATED CAB's
Nonetheless, as discussed earlier, the difference between the nominal and real measures of imbalance essentially results from under-recorded capital repayments ($\mu$). Hence the real CAD = nominal KAS – $\mu$. Since the nominal imbalance was higher on average in the 1980's (4.8% of GDP) compared with the 1970's (1.8%), yet inflation was on average slightly lower (9.8% for the 1970's and 8.2% for the 1980's) making $\mu$ lower, it follows that real capital transfer should have been greater on average in the later period.

2. **Matching the larger nominal capital inflow, there was a sharp rise in the stock of Australia's net foreign liabilities, particularly from the early 1980's.**

The predominant form of the increase in net external liabilities from the early 1980's was debt, as opposed to equity participation (see Chart 2.9). Moreover, most of the rise was due to increased borrowing by the non-official sector which includes both private and public enterprises (Chart 2.10). The net external debt position was characterised by three phases over the 1970's and 1980's. In the 1970's it was relatively low and stable, yet rose markedly in the early to mid 1980's and then plateaued over the late 1980's reaching a peak, as a percentage of GDP, of 44 percent in 1987. Another notable feature of the higher stock of gross foreign debt was that much of the increase in the 1980's was denominated in Australian dollars, rising from 14.5 to 38.2 percent of the total between 1981 and 1989. See the earlier Table 2.1.

In terms of the direct versus portfolio foreign investment distinction, Chart 2.11 shows that whereas direct investment in Australia accounted for a relatively larger share of total capital inflow in the 1970's, its growth in the 1980's, though still strong, was outpaced by substantially higher growth in portfolio investment. However, in terms of capital outflows, the direct share of Australian investment abroad actually increased. Total outward investment rose sharply at the beginning of the 1980's, but from a much lower base than inward foreign investment.
CHART 2.9 - NET EXTERNAL LIABILITIES: BORROWING VS EQUITY

NET LIABILITIES / GDP (%)
CHART 2.11 - DIRECT VS PORTFOLIO FOREIGN INVESTMENT
3. In nominal and inflation adjusted terms, gross private saving, the major component of total saving, was relatively stable as a proportion of GDP over the 1970's and 1980's.

Gross private sector saving is the sum of household saving and corporate retained earnings (which includes provisions for depreciation of the capital stock). The pattern of private saving, as a proportion of GDP, is depicted in Chart 2.12.

At the disaggregated level, the household saving component varied considerably over the two decades. Interestingly, however, rises and falls in household savings tended to be largely offset by opposite changes in business saving. Though some mention is made of the interaction between household and business saving in the interpretation of the stylized facts in Chapter 5, for most purposes subsequent discussion of saving is restricted to the behaviour of total private saving.

Further measurement issues bear upon the available estimates of saving. First, as we have seen, the statistical discrepancy means that official annual CAD estimates and the saving-investment residual do not precisely correspond. Although not large relative to the values of gross saving and investment considered separately, the statistical discrepancy can be significant in relation to the difference between these aggregates, or alternatively relative to the CAD measure from the external accounts. For instance, in the 1980's the absolute value of the statistical discrepancy was on average some 20 percent as large as the measured CAD's. Nonetheless, as Edey and Britten-Jones (1990) concluded, even accepting the extreme assumption that the discrepancy represents unrecorded consumption does not materially affect the stylized fact that private saving remained reasonably stable throughout the 1970's and 1980's.
CHART 2.12 - GROSS PRIVATE SAVING
Conceptual questions about measures of private saving have also been raised by Eisner (1988) who argues that, contrary to national accounting principles, saving should include expenditure on consumer durables and capital gains on wealth holdings. These issues will be further considered in the final chapter, which explicitly focuses on the issue of national net wealth, or net worth, the stock equivalent of accumulated saving.

4. Nominal and real gross private investment expenditure as a proportion of GDP was on average higher in the 1980's than in the 1970's.

The behaviour of private investment behaviour as a proportion of GDP, over the two decades under scrutiny is depicted in Chart 2.13. The main feature of investment expenditure is that, in current and constant price terms, it increased from the mid 1970's through to the end of the 1980's, with the most notable exception being the sharp dip reflecting the 1982–83 recession. Moreover, the nature of investment activity changed somewhat more throughout the 1980's than the 1970's. Whereas the peak reached at the beginning of the 1980's resulted primarily from heightened investment in the energy–related mining sector, towards the end of the decade it was more broadly based overall, though investment in non–dwelling construction was the most buoyant component.

5. Gross public saving to GDP generally fell sharply throughout most of the 1970's and again in the early 1980's, yet rose strongly from the mid 1980's until the end of the decade.

Chart 2.14 summarizes the nominal and real Federal budget imbalance as a partial, though key indicator of the national fiscal stance. Based on data in Table 2.3, this chart suggests that for the 1980's fiscal policy was tightened significantly from 1983–84 after a period of expansion at the beginning of the decade.
CHART 2.13 - CROSS PRIVATE INVESTMENT
CHART 2.14 - REAL AND NOMINAL FEDERAL BUDGET
This is broadly confirmed by the pattern of gross public sector saving over the two decades which is depicted in Chart 2.15. Both the nominal and inflation-adjusted public saving series follow a broadly similar pattern, the largest deviation being in the mid 1970's when inflation was at its highest. Although there was some reversal in the late 1970's of the marked decline in public saving from the beginning of the decade, this was more than offset by another sharp fall in the early 1980's, reaching a trough in 1983–84. Thereafter, public saving continued to rise, and by decade's close was, at least in inflation-adjusted terms, almost restored to the level of the early 1970's as a proportion of GDP.


This stylized fact is shown in Chart 2.16. Though the fall in gross public investment suggest the government sector spent less on public infrastructure as a share of total outlays, it also reflects, particularly in the later half of the 1980's, the sale of public assets to the private sector. According to national accounting convention, the sale of public assets to private interests, domestic or foreign, raises domestic investment to the same extent (see Stemp (1992); hence a small part of the increase in gross private investment discussed above is due to this factor. Nonetheless, public asset sales should not affect the overall saving–investment imbalance for given saving, since what is subtracted from public investment is added to private investment.

For an alternative summary picture of the behaviour of both private and public consumption and investment over the 1970's and 1980's, see Chart 2.17. This chart reinforces the stylized facts presented so far about domestic saving and investment behaviour (facts 3, 4, 5, and 6). For instance, the average real rate of growth of private consumption, (and by implication private saving with steady income growth), was
CHART 2.16 - GROSS PUBLIC INVESTMENT
relatively stable throughout, whereas in average terms, real private investment rose markedly for the 1980's. With respect to the fiscal activity of the general government sector, both public consumption and investment were relatively lower in the later decade, largely due to the fiscal consolidation from the middle of that decade.

Furthermore, the general strengthening of total capital accumulation in the 1980's, with the rise in real private investment more than offsetting the relative decline in public investment, is further confirmed by the pattern of growth in the tangible capital stock, as shown in Chart 2.18. The ABS capital stock data depicted here are based on replacement cost valuation methods in accordance with international national accounting convention and hence do not reflect changing market values of capital. We will return to the issue of valuing the capital stock and provide a more appropriate measure for our purposes in Chapter 6, when considering a balance sheet approach to Australia's international macroeconomic position.

The above stylized facts have described the behaviour of economy-wide quantity measures as these should be recorded under inflationary conditions in a comprehensive system of social accounts. As we will see in later discussion however, a key determinant of NFI as our principal focus is the domestic return on capital (a price) relative to returns available on capital abroad. A partial measure of relative returns on capital is shown in Chart 2.19. This chart depicts the behaviour of the implicit interest rate paid to foreigners as derived from ABS foreign investment statistics, relative to short term and long term domestic interest rates (the 90 day bank bill rate and 10 year government bond rate).
Chart 2.17 - Consumption, Investment and Output Growth
$BILLION (NOMINAL)

YEAR

PRIVATE CAPITAL

PUBLIC CAPITAL

CHART 2.18 - GROSS CAPITAL STOCK
CHART 2.19 - SHORT TERM, LONG TERM AND IMPLICIT FOREIGN INTEREST RATES
It is evident that domestic rates persistently exceeded "the" foreign interest rate by at least several percentage points over the 1980's and that the extent of co-movement between domestic long term rates and the foreign rate increased from the mid 1980's. Unfortunately, comparisons can not be made for the 1970's as ABS data on net interest paid on foreign debt are not available.

Interpreting relative rates of return on capital is not straightforward however, as cross country rates may reflect a range of influences, such as perceptions of risk and future exchange rate movements when external liabilities are denominated in foreign currency. The somewhat complex theoretical issues raised by alternative partial measures of relative rates of return on capital will be treated in more depth in Chapter 5, which also covers international and Australian empirical evidence on the issue.

2.5 Conclusion

This chapter presented a detailed international macroeconomic accounting framework, aspects of which will be referred to repeatedly in later chapters. For instance, in Chapters 3 and 4, the many approaches to external account determination are expounded and critically evaluated with frequent reference to the real and financial linkages detailed above. New aggregate data measures presented in this chapter also provide a basis for the empirical and policy analysis of Chapters 5, 6 and 7.
### Appendix 2.1

#### Australian Macroeconomic Data, 1970–71 to 1989–90

**Table A.2.1  External Accounts ($ million)**

<table>
<thead>
<tr>
<th>Current Account</th>
<th>Merchandise Trade</th>
<th>Net Services</th>
<th>Net Income</th>
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(b) Surplus on general government current transactions.

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**AT CURRENT PRICES**

---

**AT AVERAGE 1984-85 PRICES (A)**

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**Source:** ABS, National Income and Expenditure 1989-90, Cat. 5204.0, Table 1.
Table A.2.5 National Income ($ million)

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Source: ABS, Australian National Accounts 1989–90, Cat. 5204.0, Table 4.
### Table A.2.6 Government Outlays and Receipts ($ million)

| Year   | Outlays | | | | | | Receipts | | | | | |
|--------|---------|---|---|---|---|---|---|---|---|---|---|---|---|
|        | C<sub>g</sub> | I<sub>g</sub> | Interest | Transfers | Other | Total | Taxes, Fees, | Fines | Interest | Other | Revenue | Total | Revenue | Net Financing |
| 1970–71| 4217    | 1347 | 640 | 1858 | 1286 | 9348 | 3604 | 451 | 238 | 9293 | 41 |
| 1971–72| 4816    | 1474 | 687 | 2198 | 1592 | 10767 | 9833 | 496 | 247 | 10576 | 166 |
| 1972–73| 5433    | 1649 | 755 | 2737 | 1690 | 12264 | 10783 | 553 | 265 | 11601 | 644 |
| 1973–74| 6658    | 1953 | 808 | 3298 | 2169 | 14886 | 13715 | 641 | 268 | 14624 | 18 |
| 1974–75| 9185    | 2908 | 1006 | 4562 | 3641 | 21302 | 17708 | 774 | 340 | 18822 | 2379 |
| 1975–76| 11458   | 3419 | 1120 | 6279 | 3464 | 25740 | 21345 | 952 | 367 | 22664 | 2950 |
| 1976–77| 13344   | 3372 | 1598 | 7588 | 3277 | 29179 | 24821 | 1162 | 517 | 26500 | 2533 |
| 1977–78| 15025   | 3472 | 1884 | 8524 | 3539 | 32444 | 26977 | 1355 | 769 | 29101 | 3191 |
| 1978–79| 16446   | 3521 | 2253 | 9356 | 3643 | 35219 | 29439 | 1454 | 908 | 31801 | 3394 |
| 1979–80| 18598   | 3641 | 2527 | 10170 | 4043 | 38979 | 34273 | 1526 | 1008 | 36807 | 2121 |
| 1980–81| 21633   | 3703 | 3001 | 11484 | 4856 | 44677 | 40437 | 1617 | 1146 | 43200 | 1426 |
| 1981–82| 24862   | 4177 | 3408 | 13315 | 5492 | 51254 | 47007 | 1975 | 1382 | 50364 | 809 |
| 1982–83| 28322   | 4718 | 4008 | 16238 | 7254 | 60540 | 51494 | 2304 | 1914 | 55712 | 4738 |
| 1983–84| 32045   | 5302 | 5112 | 19008 | 8104 | 69571 | 56571 | 2455 | 2451 | 61477 | 7971 |
| 1984–85| 39915   | 6207 | 6839 | 21320 | 9198 | 79479 | 66094 | 2890 | 2802 | 71786 | 7337 |
| 1985–86| 39854   | 7114 | 8533 | 23057 | 9593 | 88151 | 73246 | 3707 | 4073 | 81026 | 6687 |
| 1986–87| 43728   | 7819 | 9783 | 24990 | 1205 | 96525 | 82545 | 3837 | 4727 | 91109 | 4987 |
| 1987–88| 46695   | 7513 | 10204 | 27843 | 9082 | 101337 | 93976 | 4094 | 4347 | 102417 | 1087 |
| 1988–89| 49808   | 7102 | 10657 | 29360 | 10173 | 107100 | 105536 | 4825 | 3259 | 113620 | 6418 |
| 1989–90| n.a.    | n.a. | n.a. | n.a. | n.a. | n.a. | 114057(p) | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |

CHAPTER 3

TRADITIONAL APPROACHES TO THE EXTERNAL ACCOUNTS

3.1 Introduction

This chapter surveys traditional approaches to analysing the external accounts by expositing and critically evaluating the main models which have surfaced over the years. The different approaches are presented largely in order of their historical emergence. What becomes apparent is that economists' perceptions of the theoretical and policy significance of the external accounts evolved in line with changes in the international "rules of the game". For instance, the classical adjustment mechanism sought to explain the dynamics of reaching external equilibrium with fixed exchange rates under the gold standard. After the abandonment of the gold standard, the elasticities approach to trade account adjustment became popular and was heavily influenced by the partial approach of Neo-classicism with its emphasis on changing relative prices of exports and imports, yet in an environment where the exchange rate could be used as an instrument of policy. After the emergence of macroeconomics as a distinct sub-discipline from the late 1930's, economy-wide approaches to the external accounts again became popular as reflected in the absorption related approaches of the 1950's.

In the 1960's, the monetary approach to the external accounts emerged in the open economy literature in parallel with the Monetarists' rejection of the Keynesian emphasis on the expenditure aggregates, to the neglect of monetary factors, in the closed economy literature. However, the rules of the game when these earlier approaches first emerged were managed exchange rates and limited international capital mobility. The macroeconomic approaches which developed in the two decades following World War II
for instance, did so in an environment where strict exchange controls over the movement
of financial capital were in force which effectively segmented financial markets, making
capital markets unresponsive to interest rate differentials. Hence the models of this era
used fixed exchange rates and capital immobility as starting assumptions such that the
current account became the focus of balance of payments analysis to the disregard of the
capital account. It was not until the 1960's, by which time capital markets had become
more integrated, that the significance of capital mobility was fully recognised and
explicitly modelled in the Mundell–Fleming approach. With the move to floating rates in
the 1970's and 1980's, the flexible exchange rate – perfect capital mobility variant of the
Mundell–Fleming approach came to the fore, largely because it was consistent with the
international rules then prevailing.

Since we are most interested in the significance of the external accounts in an
environment of floating exchange rates and capital mobility, the Mundell–Fleming
approach, including recent extensions, is treated in more depth than its predecessors as it
remains the prevailing orthodoxy in open economy macroeconomics. Nonetheless, we
conclude that this mainstay approach falls short of providing a meaningful framework for
analysing the macroeconomic implications of foreign investment flows, largely because of
its ad hoc formulation of the current and capital accounts and its failure to capture
common determinants of the external accounts taken as a whole.

3.2 The Classical Approach

The open economy literature has traditionally focussed on the trade and current
account imbalance as a measure of balance of payments disequilibrium or external
imbalance. Although the notion of external balance is today somewhat elusive under
conditions where international borrowing and lending is freely permitted and exchange rates float, it was clear to the ancient Mercantilist school of thought, popularly espoused in England between the fifteenth and mid-eighteenth centuries, that external balance meant a trade surplus. The Mercantilist position on the balance of payments is best captured in Thomas Mun's (1664) pamphlet entitled "England's Treasure by Foreign Trade, or the Balance of our Foreign Trade is the Rule of Our Treasure" in which he proposed that:

"The ordinary means therefore to increase our wealth and treasure is by Foreign Trade, wherein we must even observe this rule: to sell more to strangers yearly than we consume of theirs in value". Why a trade surplus was of itself beneficial was not clearly enunciated by the Mercantilist writers, although it was tied to their belief that the accumulation of specie was the chief means by which nations could increase their wealth (See Roll (1961), Deane (1978)).

The benefits or otherwise of particular outcomes on the trade account continue to generate debate. Indeed, Mercantilist instincts apparently live on in the hearts of many economists and policy makers today to the extent that external balance is often understood as achieving a surplus on the current account. Not only should the current account be an explicit goal of policy but, in the Mercantilist spirit, a current account surplus is somehow indicative of national economic welfare.

Using a macroeconomic argument, David Hume discredited the Mercantilists' policy objective of actively pursuing a trade surplus and, in so doing, expostulated the first theory of balance of payments adjustment. In his classic essay, "Of the Balance of Trade" (1752) Hume outlined what became known as the 'price–specie–flow' mechanism. Hume argued that under the gold standard, a trade surplus would certainly induce gold inflow but this would also increase the domestic money supply. Through the quantity theory of
money, the domestic price level would then rise, worsening competitiveness which would subsequently reverse the trade imbalance.

Schematically

(1) Trade Surplus (Deficit) → Gold In-Flow (Outflow) → Money Supply Increase (Decrease)

(2) → Domestic Price Level Increase (Decrease) → Fall (Rise) in Competitiveness

(3) → Reversal of Trade Surplus (Deficit)

Importantly, the linkages suggested that trade account imbalances were eventually self correcting, thus obviating the need for any policy response to balance of payments disturbances.

Nonetheless, several factors could impede the external adjustment process proposed by Hume. For instance, the link between stages (3) and (4) has been the subject of continued controversy, particularly its relevance for short period analysis. Furthermore, the link between stages (5) and (6) also only worked with constant foreign price levels and the absence of retaliatory trade action on the part of foreign governments. The exact nature of the relative price conditions necessary at stage (5) to alter the trade imbalance at stage (6) later preoccupied the advocates of the so called elasticities approach.

Misplaced Mercantilist doctrine about the paramount importance of the trade account also provided Hume's contemporary, Adam Smith, with a motive for writing *The Wealth of Nations* (1776) in which Smith espoused the case for minimal intervention by government in most spheres of economic activity including trade with foreigners. Smith rejected the thrust of Mercantilist precepts and policy prescriptions, about the need for
State intervention to improve economic welfare, yet his classic book does not acknowledge the price-specie-flow model, or anything resembling it. Instead, Smith emphasised the gains from international trade which hitherto had been largely considered as a zero sum game. On the question of external imbalance, Smith commented:

"Nothing ... can be more absurd than this whole doctrine of the balance of trade ... When two places trade with one another, this doctrine supposes that, if the balance be even, neither of them either loses or gains; but if it leans in any degree to one side, that one of them loses, and the other gains in proportion to its declension from the exact equilibrium. Both suppositions are false ... that trade which, without force or constraint, is naturally carried on between any two places, is always advantageous ... to both." (Adam Smith, Bk. IV, Ch. III, part 2, para. 2).

We will return to this Smithian theme when considering the gains from international trade in saving in the next chapter.

Nonetheless, it was the Humean adjustment mechanism which profoundly influenced subsequent international monetary theory and balance of payments analysis. Indeed it was the ruling orthodoxy up until the abandonment of the gold standard earlier this century, whereafter it lost its relevance. Even so, Jacob Viner suggested as late as 1937 that:

"The 'classical' theory of the mechanism of international trade as developed from Hume to JS Mill is still, in its general lines, the predominant theory". (p.291)

3.3 The Elasticities Approach

Although the classical approach remained intact during the neo-classical Marginalist revolution of the late nineteenth century, Marginalism, with its emphasis on partial, as opposed to general equilibrium analysis, inspired a new approach to the external account termed the "elasticities approach". With the trade balance still the main focus, the elasticities approach explained the response of exports and imports, not under the classical
conditions where the exchange rate was fixed by virtue of the gold standard and domestic price levels varied, but where domestic price levels were fixed and the exchange rate itself could vary. In common with the classical approach, the elasticities approach did not allow changing national income levels to affect trade flows. Instead, it sought to establish the conditions necessary for changes in competitiveness to improve trade imbalances.

The approach was based on contributions by Bickerdike (1920), Robinson (1937), Lerner (1944) and Harberger (1950) and has been surveyed more recently in Bruce and Purvis (1985), Kenen (1985), Gandolfo (1987) and Dernburg (1989). In essence, the approach centred on the response to exchange rate changes of the trade balance in foreign exchange terms, since trade deficits ultimately had to be financed by depleting official foreign exchange reserves.

The elasticities approach provides the following condition for a devaluation to improve the trade balance

\[ \frac{\varepsilon_s(n_s-1)}{(\eta_s+\varepsilon_s)} + \frac{(\eta_M(1+\varepsilon_M))}{(\eta_M+\varepsilon_M)} > 0 \]  

(1)

where \( \varepsilon_s \) is the elasticity of the domestic supply of exports, \( \eta_s \) is the elasticity of foreign demand for exports, \( \varepsilon_M \) is the elasticity of the supply of imports and \( \eta_M \) is the elasticity of domestic demand for imports.

See Appendix 3.1 for a formal derivation of the above. From (1) we can derive a special condition. For instance, consider first the case of a small economy facing an infinitely elastic foreign demand for its exports (\( \eta_s = \infty \)) and an infinite supply of imports (\( \varepsilon_M = \infty \)). Taking the limit of (1)
Hence, a devaluation always raises net exports for a small economy.

The next condition assumes underutilized capacity at home such that increased export demand is automatically met by exports, the supply of which is infinitely elastic ($\varepsilon_x = \infty$). Moreover there are no supply constraints abroad either, such that the supply of imports is infinitely elastic ($\varepsilon_M = \infty$). Taking the limit of (1) under these assumptions,

$$\lim_{\eta_x, \varepsilon_M \to \infty} \left\{ \frac{\varepsilon_x (\eta_x - 1)}{(\eta_x + \varepsilon_x)} + \frac{\eta_M (1 + \varepsilon_M)}{\eta_M + \varepsilon_M} \right\} = \varepsilon_x + \eta_M > 0$$

(2)

(3) can be rewritten as $\eta_x + \eta_M > 1$ which is known as the Marshall–Lerner condition.

As an abbreviated form of the elasticities approach, the Marshall–Lerner condition therefore suggested that a devaluation of a country's currency would improve its trade or current account balance if the sum of the price elasticities of domestic and foreign demands for imports were larger than unity. This condition therefore ensured that the increased quantity of exports following a change in relative prices after a devaluation offsets the increased cost of imports. If the condition was not met, this implied revaluation, not devaluation was necessary for restoring external balance. The key assumption of the Marshall–Lerner variant of the elasticities approach was that the supply of exports and imports were infinitely elastic. Though the macroeconomic implications of changes in export and import volumes were not considered by the approach, implicitly the assumptions about supply elasticities were only applicable to recessed economies.
Many empirical studies subsequently sought to estimate demand elasticities based on this approach to the trade balance. Earlier studies (Hinshaw (1945), Chang (1946)) suggested elasticities were low in the short run which generated 'elasticity pessimism' about trade account adjustment. Later studies (see Houthakker and Magee (1969), Artus and Knight (1984) and Goldstein and Khan (1985)) also estimated a low response of trade flows in the first year after an exchange rate change, although over longer periods estimates for industrial countries show the Marshall–Lerner condition was usually satisfied.

The evidence that short run export and import demand elasticities are low also provides a justification for the so-called J curve phenomenon, which suggests that after a devaluation or depreciation, a pre-existing trade account initially widens before eventually narrowing. J curves are also often explained with reference to contracts (see Junz and Rhomberg (1973)). For instance, soon after a devaluation, recorded export and import volumes may for some months simply reflect purchasing decisions based on the old exchange rate, so that the depreciation only raises the value of recorded imports, whereas exports measured in domestic currency do not change. Moreover, sluggish trade account adjustment to changes in competitiveness may reflect lags in producing additional exports, although acknowledging supply constraints on the export side contravenes one of the assumptions underlying the Marshall–Lerner condition.

3.4 Absorption Approaches

The elasticities approach to the external accounts with its sole emphasis on the effects of relative price changes on the trade account, to the neglect of other macroeconomic influences, obviously seemed incomplete by the 1950's, by which time
Keynes' *General Theory* (1936) had profoundly influenced macroeconomic thinking. On the issue of external account determination, *The General Theory* was silent. Indeed, this profoundly influential book could be criticised for leading modern macroeconomics astray insofar as it reasoned on the assumption of a closed economy, a line of enquiry at odds with the emphasis on international linkages in the writings of the other great English economists including David Ricardo, John Stuart Mill and Alfred Marshall.

It was left to another English economist James Meade (1951, 1952) to cast balance of payments analysis in an explicit macroeconomic framework. Using a framework which was in many ways a precursor to the Mundell–Fleming approach to be discussed shortly, Meade allowed for alternative exchange rate regimes and some capital mobility in his analysis of the external accounts and was first to draw the distinction between the often conflicting goals of internal balance (full employment) and external balance (balance of payments stability). At the same time, Alexander (1952) working at the International Monetary Fund, highlighted the distinction between national product and national expenditure or absorption as earlier discussed in Chapter 2 and expressed in equation (1.1).

Despite earlier criticisms that Alexander's absorption approach was no substitute for the elasticities approach because it was based on nothing more than a tautological accounting identity (Machlup 1955, 1956), it provided a crucial insight. It stressed the importance of analysing the external accounts in the context of overall spending and production. Alexander (1959) later attempted a synthesis of the elasticities and absorption approaches, although this was disappointing since it simply superimposed Keynesian income multiplier effects onto the elasticities solution of the trade account impact of devaluation and did not simultaneously consider the interaction of relative price and income effects.
An absorption related approach which did successfully model the contemporaneous effects of changing relative prices and expenditure was proposed by Swan (1960) and Salter (1959). What distinguished this approach was a markedly different specification of goods markets for small open economies. Previous macroeconomic approaches had often assumed implicitly that all goods were exportable and that the prices of goods produced domestically were endogeneous, whereas the prices of imports in foreign exchange were exogeneous.

In contrast the Swan–Salter approach (see Corden (1982, 1985), Dornbusch (1980) and Prachowny (1984) for extensions) highlighted the goods market dichotomy between tradables and non–tradables. According to Swan, the prices a small economy receives for exports and pays for imports "... are independent of domestic conditions of supply and demand" (1960, p.53) whereas Salter (1959) termed non–tradables as goods "...which do not enter into world trade; their prices are determined solely by internal costs and demand" (p.226). Oppenheimer (1974) also notes the contribution of the Swedish economist Ohlin on this distinction, while Hinshaw (1975) recalls that Ricardo used the term "home goods" to describe commodities which did not enter into world trade.

Also known as the "dependent economy" or Australian model, this approach assumes a given terms of trade, here measured by the ratio of the exogenously determined prices received for exportables to the exogenously determined prices paid for importables. With this assumption, exportables and importables can be lumped together as tradables by virtue of Hicks (1946) composite commodity theorem:

"A collection of physical things can always be treated as if they were identical in the units of a simple commodity so long as their relative prices can be assumed unchanged." (p.33).
Hence tradables consist of exports, imports, export substitutes and import competing goods, whereas non–tradables are usually imagined as the bulk of services or goods prevented from entering into world trade because of prohibitive transport costs or tariffs.

The centrally managed nominal exchange rate converts the given world prices of tradables into domestic currency terms \( P_T = eP^*_T \) and the real exchange rate \( (V) \), or competitiveness is here defined as the ratio of the domestic price of non–tradables \( (P_N) \) to the price of tradables \( (P_T) \): \[ V = \frac{P_N}{P_T}. \]

In the dependent economy model, external balance is synonomous with a balanced trade account and capital flows are absent. Moreover, without servicing costs on earlier capital flows, the current account equates with the trade account, ignoring other international transfers. Internal balance is the correspondence between the output of, and expenditure on, non–tradables. The Salter diagram below depicts the simultaneous attainment of internal and external balance at point E.

![Figure 3.1 – The Dependent Economy Model](image-url)
The production transformation curve indicates possible output combinations for existing technology and factor endowments. For a given set of production possibilities, a rise in tradable output requires forgone non-tradable output. On the other hand, the community indifference curve represents ex ante absorption in Alexander's sense.

With reference to the above diagram, full equilibrium implies OT tradables are supplied and demanded at the given real exchange rate ensuring external balance, whereas ON non-tradables are supplied and demanded at the same real exchange rate ensuring internal balance. The approach suggests that departures from internal or external imbalance may occur if competitiveness changes or a disparity arises between output and expenditure. In such circumstances, a policy response simultaneously combining managed exchange rate changes and changes in autonomous expenditure becomes necessary. There are two instruments for two targets consistent with Tinbergen's (1952) rule.

For given technology and factor endowments, the supply side of the model may be expressed in symbols as $Y_{TN} = Y_{TN}(V)$. The expenditure side is $A_{TN} = A_{TN}(V, \bar{A})$ where $\bar{A}$ is the exogeneous component of expenditure which can be influenced by fiscal or monetary policy. Hence, production of tradables and non-tradables is in the short run, simply a function of competitiveness, yet absorption is a function of both competitiveness and autonomous expenditure.

Internal balance obtains when $Y_s(V) = A_s(V, A)$ and external balance obtains when $Y_t(V) = A_t(V, A)$. Differentiating these equations totally (following Pitchford, 1986) then allows us to derive the internal and external balance loci. Starting with the internal balance locus (NN)

$$\frac{\partial Y_N}{\partial V} dV = \frac{\partial A_N}{\partial V} dV + \frac{\partial A_N}{\partial \bar{A}} d\bar{A}$$
\[ \frac{dV}{dA} = \frac{\partial A_N}{\partial V} \left( \frac{\partial Y_N}{\partial V} - \frac{\partial A_N}{\partial V} \right) > 0 \]

For the external balance locus (TT)

\[ \frac{\partial Y_T}{\partial V} dV = \frac{\partial A_T}{\partial V} dV + \frac{\partial A_T}{\partial A} dA \]

\[ \therefore \frac{dV}{dA} = \frac{\partial A_T}{\partial A} \left( \frac{\partial Y_T}{\partial V} - \frac{\partial A_T}{\partial V} \right) < 0 \]

Depicting these loci in \( V-A \) space yields the Swan diagram with its four "zones of economic unhappiness".

![Swan Diagram](image)

**Figure 3.2 - The Swan Diagram**

Intuitively, the internal balance schedule slopes upward because as competitiveness worsens (a rise in \( V \)), net exports fall, and autonomous expenditure must increase to
compensate for this. The external balance schedule slopes downward because an increase in autonomous expenditure worsens net exports unless offset by an improvement in competitiveness (a fall in V).

Above the NN locus the economy has underutilised resources, below it there are excess demand pressures. Above the TT line the economy experiences a trade (current) account deficit, below it a trade account surplus.

An economy out of equilibrium reaches simultaneous internal and external balance through the combined use of managed exchange rate changes to alter competitiveness and activist fiscal and monetary policy to raise or lower total expenditure. For instance, an economy experiencing excess aggregate demand pressures and an external deficit (zone III) could restore internal balance by contractionary policy and restore external balance by devaluing the exchange rate.

Given its particular goods market specification, devaluation improves the trade balance and revaluation worsens the trade balance unambiguously. As shown by Pitchford (1986), if we totally differentiate the expression for the trade balance in foreign exchange terms, $T^* = (Y_T V - A_T V)P_T^*$ with respect to V, where $Y_T$ and $A_T$ are volumes,

$$dT^* = P_T^* \frac{\partial Y_T}{\partial V} dV - P_T^* \frac{\partial A_T}{\partial V} dV$$

:. $$\frac{dT^*}{dV} = P_T^* (\frac{\partial Y_T}{\partial V} - \frac{\partial A_T}{\partial V}) < 0$$

This result is compatible with the elasticities condition pertaining to a small country, as shown earlier, but contrasts with the conditionality of the normal Marshall–Lerner
condition. Intuitively devaluation lowers the relative price of non-traded goods to traded goods, encouraging production and discouraging absorption of tradables.

Consistent with the international economic environment of the 1950's and 1960's, the original dependent economy model assumed the exchange rate was managed and ignored external capital flows and the possibility that domestic saving and investment could diverge. Once the exchange rate is permitted to float however, external balance is automatically achieved in the model as exports must always equal imports as an equilibrium condition in the foreign exchange market. Hence, a dependent economy always finds itself on the TT locus of the Swan diagram and the goal of external balance becomes redundant. Unfortunately, the model cannot be so easily adapted to allow for international capital mobility, a factor which severely limits the model's usefulness as a framework for analysing external account determination in the 1990's.

3.5 **Monetary Approaches**

The developments in international macroeconomics and balance of payments theory from the elasticities approach, which first emerged in the 1920's, to the absorption related approaches of the 1950's and 1960's mainly emphasised adjustment in the goods markets with the trade balance providing the measure of external disequilibrium. However, a different approach to the external accounts reemphasising the role of money in the external adjustment process emerged in the literature by the late 1960's and 1970's, although an earlier version of the approach had been proposed by Polak (1957), another International Monetary Fund economist (see also IMF (1977)). The main proponents of monetary approaches to balance of payments (MABP) analysis included Hahn (1959), Mundell

This approach had more in common with the original Humean approach than other
macroeconomic approaches because it restored the notion that the external adjustment
process was essentially self equilibrating and not of itself a concern. Moreover, like the
classical approach, it afforded the demand and supply of money balances a central role.
Other Humean features of this approach were that growth in national income was
exogenously determined by real factors such as advances in technology and population
growth and that demands for particular national currencies by domestic residents were
stable functions of a few variables, the most important being real income. Unlike the
original price–specie–flow mechanism however, changes in relative export and import
prices on which the elasticities approach focussed were eliminated from the analysis.

Instead of examining the trade or current account imbalance per se, the MABP
shifted attention to the overall balance of payments as a monetary phenomenon reflecting
the change in the central banks reserve holdings. With reference to our real and financial
flows matrix of Chapter 2 (Figure 2.4), the analysis centred on the relationships between
the money base and changes in foreign currency reserves (rows 2 and 7), with the central
bank (column 5) playing a prominent role.

Another distinguishing feature of the MABP was its emphasis on stocks, in contrast
to the earlier flow oriented approaches. It stressed that the flow of international reserves,
as the measure of external imbalance under fixed rates, essentially reflected domestic
money market disequilibrium which could only be restored when the stock demand and
stock supply of real balances reached their desired levels.
MABP theory actually encompasses a wide class of models. One version of the monetary approach proposed by Dornbusch (1973), Frenkel and Mussa (1985) and Gandolfo (1987) assumes a small open economy facing world prices for all goods produced and consumed, but there is no capital account. This version of the MABP which also invokes the output–absorption distinction will be outlined to illustrate the main features of the approach.

The demand for (L) money is considered a stable function of income such that

$$L = kP\bar{Y}$$  \hspace{1cm} (4)

where $k$ is a parameter, $P$ is the domestic price level and $\bar{Y}$ is constant real output at the level of full employment.

If money, simply defined as money base, is the only asset, then the difference between output and expenditure, the trade imbalance, must be equal to the change in the money base held by the public.

$$dM^r = P\bar{Y} - A$$  \hspace{1cm} (5)

Furthermore, under fixed rates,

$$dR = dM^r$$  \hspace{1cm} (6)

The difference between absorption and income is also related to the difference between actual and desired money holdings,

$$P\bar{Y} - A = \alpha(L - M^r)$$

$0 < \alpha < 1$, where $\alpha$ is an adjustment parameter. From (4), (5) and (6) we can write

$$dR = \alpha(kP\bar{Y} - M^r)$$  \hspace{1cm} (7)
Equation (7') expresses the self correcting nature of any discrepancy between money supply and money demand. For instance, if money demand exceeds the available supply, \( dR \) will be positive, indicating that a balance of payments surplus will eventuate and persist until it raises the money supply to the level consistent with desired money holdings. On the contrary, if the domestic supply of money available to be held by residents exceeds the level desired, there will be a balance of payments deficit which will only last until desired and actual money stocks are again equal. Graphically, the model can be illustrated by a simple phase diagram which shows the adjustment mechanism is stable.

Figure 3.3 – The Monetary Approach to the Balance of Payments

If for instance the money supply is \( M'_1 \) which falls short of desired cash holdings at \( kP\bar{Y} \), then there would be reduced absorption (or hoarding) by domestic residents in an attempt to accumulate cash balances. This would manifest as a trade surplus matched by a rise in
reserves. A steady expansion of the domestic money supply continues until desired and actual money stocks again coincide. At that point external balance is restored.

Several important policy implications followed from the MABP. First, the approach stressed, as did Hume, that under fixed rates the money supply is in the long run endogenous, determined not by the central bank but essentially by the public's demand for cash balances. Furthermore, devaluations will only have a transitory effect on the balance of payments and only to the extent that they affect stock equilibrium in the money market (Johnson (1972), Dornbusch (1973)). This is also shown in the figure above. By invoking the absolute purchasing power parity condition \( P = e P^* \) devaluation firstly raises the domestic price level to \( P^1 \). Domestic residents again attempt to restore real cash balances to the previous level by reducing absorption. In so doing, a balance of payments surplus arises and persists until the nominal money supply increases (proportionate to the increase in the price level) to restore money stock equilibrium.

With the generalised move to floating rates in the 1970's, the MABP became somewhat redundant as a means of understanding the external accounts to the extent that with floating exchange rates the overall balance of payments as a measure of a central bank's support for a particular exchange rate ceased to be the constraint it had been hitherto under the Bretton Woods system. Accordingly, attention shifted to the determinants of the exchange rate as the macroeconomic variable reflecting the pressure of external adjustment. The essential ingredients of the MABP were then deployed to model exchange rate determination with continued emphasis on the role played by relative money demands and supplies. The monetary or asset approach to the exchange rate generated a vast theoretical and empirical literature (see, for instance Frenkel and Johnson (1978), Clements (1981), and Woo (1985)), a survey of which is not relevant here since the
external accounts subsequently slipped from view. Implicitly, however, these models accepted that the traditional notion of external imbalance as a quantity constraint no longer mattered for policy purposes.


The PB approach usually suggests capital flows are short lived phenomena which cease once desired and actual financial asset holdings equate. Financial capital is not perfectly mobile by assumption, though alternative financial assets remain gross substitutes in demand. By restricting attention to nominal financial wealth held by domestic residents and by using total financial wealth as a scale variable in asset demand equations, the PB approach has been used to explain the short run comparative static effects of changes in the domestic supply of money and bonds on the nominal exchange rate and domestic interest rate.

Within the PB class of open economy models, some authors have recognized a role for the current account in terms of its implications for the international investment position and hence for financial wealth holdings. For example, Kouri (1976), Dornbusch (1980) and Dornbusch and Fischer (1980) have explicitly modelled the feedback effects of current account imbalances on the exchange rate. However, the emphasis in these models is on financial phenomena to the neglect of real phenomena. In any case, since open economy
PB models ultimately seek to explain exchange rate and domestic interest rate determination, as opposed to external account determination as such, they are not particularly relevant for later purposes.

3.6 The Mundell–Fleming Approach

Perhaps the most influential macroeconomic model of an economy transacting with the rest of the world is the Mundell–Fleming (MF) model, first proposed by Fleming (1962) and Mundell (1963). Recent surveys of the MF model are included in Dornbusch (1980), Frenkel and Razin (1985), Marston (1985), Frenkel and Mussa (1985), Scarth (1988), and MacDonald (1988). What distinguishes the MF model is the prominence afforded international financial capital flows in the process of national income determination. It shifts attention away from the current account, to the overall balance of payments under managed exchange rates and to the exchange rate itself as the key external adjustment variable under floating exchange rates. Essentially, the model is the open economy extension of the Keynesian IS–LM framework following (Hicks (1937)) linking international financial capital flows, interest differentials, exchange rates, competitiveness, exports, imports and national income.

MF analysis has been highly influential mainly because of its conclusions about the effectiveness of monetary and fiscal policy for income stabilization purposes under alternative exchange rate regimes. In the following exposition, although the policy implications of adopting fixed versus floating exchange rates is addressed, discussion centres mainly on the floating exchange rate version since it is most relevant in current circumstances. After outlining the major predictions of the basic model, including the effects of various policy changes on the trade account, the major weaknesses of the
paradigm are highlighted. Notwithstanding its popularity as the ruling textbook framework for interpreting international macroeconomic policy issues, the structural shortcomings and inconsistencies of the model suggest it is not particularly useful for analysing external account determination.

3.6.1 The Basic Model

In its basic version, MF assumes a small open economy with a perfectly elastic aggregate supply curve, static exchange rate expectations and capital mobility. On the real side of the economy, the model assumes unemployed resources and a fixed price level and on the financial side there are only three financial assets (rows (2), (4) and (7) of Figure 2.4) - domestic base money which is non-substitutable for foreign base money, domestic and foreign bonds which are perfectly substitutable and foreign reserves (used to manage the exchange rate in the fixed exchange rate version of the model). Since static exchange rate expectations mean that the exchange rate is not expected to deviate from its present level, the assumption of perfect capital mobility implies that home and foreign interest rates (r and r* respectively) will always be equal, both in nominal and real terms, since there is no inflation.

Goods market equilibrium can be shown as

\[ Y = \bar{A} + A(r, Y) + T(e, Y) \]  

(8)

Y, A and T are as earlier defined in Chapter 2

1 > \( A_y > 0 \)

\( A_y < 0 \)

\( T_e > 0 \)

\( T_y < 0 \)
Consistent with its Keynesian underpinnings, gross domestic product is demand determined. Part of total absorption is autonomous (\(A\)), while the rest depends negatively on the domestic interest rate, particularly through domestic private investment, and positively on national income, through the propensity of households to consume. Government expenditure may be either public consumption or public investment and is included within the autonomous component of absorption along with private autonomous consumption and investment. Net exports (or the current account in the absence of net income or transfers paid abroad) are a function of the domestic propensity to import and the exchange rate. Given the fixed price level assumption, nominal exchange rate changes translate one for one to real exchange rate changes since the real exchange rate is defined as \(\frac{eP^*}{P}\). The Marshall–Lerner condition is assumed to hold since \(T_e > 0\). These conditions specify the IS curve of the model.

Equilibrium in the money market is given by the stock equality of real money demand (\(L\)), which depends negatively on the domestic interest rate and positively on real income, and the real money supply, \(M^s\). Therefore,

\[
L(r, Y) = M^s
\]  

(9)

where \(L_r < 0\)

\(L_Y > 0\)

These conditions underlie the standard LM curve of the model.

Under a floating exchange rate, the current and capital account balances must sum to zero so that external account equilibrium can be expressed as

\[
B = T(e, Y) + KAB(r, r') = 0
\]  

(10)

\(KAB_t \rightarrow \infty\)
Under fixed exchange rates, B is equivalent to the change in official reserve assets necessary to make up any difference between T and KAB. (B = dR* of Figure 2.4) The condition that \( KAB_r \to \infty \) reflects the assumption of perfect capital mobility, although this is often relaxed to less than perfect capital mobility, \( KAB_r > 0 \). The model may also be applied to predict the comparative static effects of real and monetary shocks under completely immobile capital, \( KAB_r = 0 \), as shown later. The assumptions made about capital mobility determine the slope of the balance of payments equilibrium locus or BP curve.

Totally differentiating the equilibrium equations (8), (9) and (10) above yields

\[
\begin{align*}
    dY - d\bar{A} - A_dr - A_ydY - T\bar{e}de - T_ydY &= 0 \\
    dM' - L_\gamma dr - L_ydY &= 0 \\
    dB - T_\gamma de - T_ydY - KAB_rdr &= 0
\end{align*}
\]

Arranging these equations in matrix form following MacDonald (1988) then yields

\[
\begin{vmatrix}
    (1-A_\gamma-T_x) & -A_y & -T_x & 0 \\
    -L_\gamma & -L_\gamma & 0 & 0 \\
    -T_\gamma & -KAB_r & -T_x & 1
\end{vmatrix}
\begin{bmatrix}
    dY \\
    dr \\
    de \\
    dB
\end{bmatrix}
= \begin{bmatrix}
    d\bar{A} \\
    -dM' \\
    0
\end{bmatrix}
\]

Using Cramer's rule and the perfect capital mobility assumption preferred in most expositions, it is then possible to derive multipliers for changes in autonomous expenditure, including public spending, and the money supply under fixed and floating exchange rates. The multipliers are estimated under the assumption of perfect capital mobility (\( KAB_r \to \infty \)). Under fixed rates, column three of the matrix disappears. Under
floating rates dB always equals zero; hence dB may be omitted as well as the last column of the first matrix.

Increases in autonomous consumption or investment (private or public) under fixed exchange rates with perfect capital mobility are effective in the sense that they raise equilibrium national income. The size of the income multiplier is

\[ \left. \frac{dY}{dA} \right|_{dB=0} = \frac{1}{(1-A_T-T_e)} > 0. \]

Under floating exchange rates, increased autonomous expenditure, due for example to fiscal expansion, is on the contrary ineffective in raising national income, but appreciates the exchange rate:

\[ \left. \frac{dY}{dA} \right|_{dB=0} = 0 \]

\[ \left. \frac{de}{dA} \right|_{dB=0} = -\frac{1}{T_e} < 0 \]

Monetary expansion, on the other hand, is shown to be an ineffective means of raising national income under fixed rates with perfect capital mobility,

\[ \left. \frac{dY}{dM} \right|_{dB=0} = 0 \]

but effective under floating rates, although it depreciates the exchange rate:

\[ \left. \frac{dY}{dM} \right|_{dB=0} = \frac{1}{L_Y} > 0 \]
A more comprehensive mathematical treatment of the comparative statics of the MF model under alternative capital mobility assumptions as well as stability analysis under floating exchange rates is included in Appendix 3.1.

3.6.2 Diagrammatic Analysis Under Floating Rates

The standard effectiveness results set out above are usually derived graphically using the familiar IS–LM–BP framework, whose loci correspond to equations (8), (9) and (10). (See Dornbusch and Fischer (1990).) Shown below is the conventional presentation, augmented by a supplementary framework, based on the same Keynesian assumptions, which allows us to trace more explicitly the effects of autonomous expenditure and monetary shocks on the trade account, as well as the saving–investment imbalance.

Consider first the implications of an autonomous spending increase on the trade account under the assumptions of a floating exchange rate and perfect capital mobility. In terms of IS–LM–BP analysis, the IS curve moves to the right putting upward pressure on the domestic interest rate. However, this incipient interest rate rise attracts foreign capital, appreciating the currency. Hence, the exchange rate is assumed to be entirely capital account driven. The loss of competitiveness thereby crowds out net exports shifting back the IS curve to its initial position.

Accompanying the IS–LM–BP diagram is what we will term an NS–NX framework. This supplementary framework highlights the effects of various shocks on the economy's saving–investment and external account imbalances which, as demonstrated in
Chapter 2, must be equal to each other ex post. In full equilibrium the saving–investment and external account imbalances must of course also be equal ex ante. The upward sloping NS schedule shows net saving and is drawn for a given autonomous expenditure and domestic interest rate. An increase in income raises net saving as the marginal propensity to consume is less than unity and investment is autonomous. Hence the slope of this schedule is determined by the marginal propensity to save which lies between zero and unity. The downward sloping NX schedule is drawn for a given level of autonomous exports and competitiveness. This schedule shows that as income rises, imports increase and hence the trade balance widens. Its slope is minus the marginal propensity to import. An improvement in competitiveness shifts the net export schedule to the right as the Marshall–Lerner condition is satisfied. For ease of exposition of the comparative static effects on the trade account and saving–investment imbalance, it is assumed that in initial equilibrium the trade account is balanced.

Consider first an increase in autonomous expenditure as shown below in Figure 3.4. This shifts the IS curve to the right and also shifts the net saving (NS) schedule rightward from point A to B, raising the trade deficit through increased imports. However, as competitiveness worsens because capital inflow appreciates the exchange rate, the NX schedule shifts left such that the trade deficit increases by OC. However, there is no net effect on income.

On the contrary, a monetary expansion under these assumptions has a powerful effect on national income. A rightward shift of the LM curve tends to lower interest rates, which, given the perfect capital mobility assumption, depreciates the exchange rate. This improves competitiveness and shifts the IS curve to the right. In the NS–NX framework, the incipient lower interest rate has no effect on autonomous expenditure but only
depreciates the exchange rate which shifts the NX schedule. In this case, the trade deficit unambiguously improves as shown in Figure 3.5.

Figure 3.4 - Domestic Expenditure Shocks in the MF Model With Perfect Capital Mobility
Domestic expenditure and monetary shocks have quite different effects if capital is assumed immobile compared with the perfect capital mobility assumption, as shown mathematically in Appendix 3.1. Again with reference to the standard IS–LM–BP diagram, the effects of various shocks on the interest rate, exchange rate, income and the trade account can be modelled by varying the slope of the BP curve. For illustrative
purposes, consider the effect of capital immobility \((KAB_t=0)\) in the limiting case of a vertical BP curve, showing that capital flows are completely unresponsive to interest rate changes, as may occur for example for economies with prohibitive exchange controls. In such circumstances, the external accounts only comprise a trade account in common with earlier approaches. If the exchange rate floats, the trade balance will always be balanced through changes in the exchange rate itself. If the exchange rate is fixed, the trade deficit becomes the balance of payments deficit and would usually be financed by a rundown in the central bank's official reserves.

\[ IS \quad IS' \quad IS'' \]

\[ BP \quad BP' \quad LM \]

\[ 0 \quad Y \]

\[ 0 \quad X \]

\[ NS \quad NS' \]

\[ NX \quad NX' \]

**Figure 3.6 - Domestic Expenditure Shocks in the MF Model With Capital Immobility**
Increased autonomous expenditure under floating rates shifts the IS curve to the right raising the trade deficit and NS also shifts. However, with immobile capital the exchange rate depreciates to restore a balanced trade account, thus further shifting the IS curve as well as the BP and NX curves.

Finally, a money supply increase under the same assumptions worsens the trade balance as income and imports rise. This depreciates the currency and thereby further shifts the IS curve rightward. The BP and NX curves also shift to the right as shown below.

Figure 3.7 - Monetary Expansion in the MF Model With Capital Immobility
The basic MF model may also be used to provide a theoretical rationale for linking expansionary fiscal policy, as manifested in wider budget deficits, to trade or current account deficits. This causal link, termed the "twin deficits" hypothesis, is a specific case of the more general case which treats the comparative static effects of increased domestic expenditure under floating exchange rates with capital mobility as outlined in Figure 3.4 above.

Budget deficits may widen as either public consumption or public investment expenditure increases or because income taxes are cut. Public expenditure increases directly augment autonomous expenditure whereas tax cuts are assumed to stimulate household consumption expenditure. Either way, consistent with the MF approach, bigger budget deficits initially put upward pressure on the domestic interest rate which induces capital inflow. This then appreciates the nominal exchange rate, crowds out net exports and widens the CAD.

In the international literature, studies arguing in favour of the "twin deficits" hypothesis include Milne (1977), Darby (1979), Hutchison and Throop (1985), Dwyer (1985), Summers (1986), Dornbusch (1986), Feldstein (1986), Darrat (1988), Zietz and Pemberton (1989) and Genberg and Swoboda (1989). Other international studies which refute the hypothesis on theoretical and empirical grounds include Greenwood (1983), Kimbrough (1985), and Niskanen (1988). The theoretical limitations of this variant of the MF approach are addressed later in this chapter. There are also several empirical studies on the relationship between Australia's Federal budget and current account imbalances. The Australian studies will be examined more closely in a later chapter.

Although we have used the augmented IS–LM–BP framework to examine the comparative statics of expenditure and monetary shocks under a floating exchange rate
with polar degrees of capital mobility, it is also possible to adapt the approach for a fixed rate environment. A summary of the main results under both regimes is included in Table 3.1. Appendix 3.1 derives values expressed in terms of the main Keynesian parameters for the comparative static effects of real and monetary shocks on interest rates, income and the exchange rate under the polar capital mobility assumptions.

### Table 3.1

**Expenditure and Money Supply Increases Under Floating and Fixed Exchange Rate Regimes**

<table>
<thead>
<tr>
<th>Floating Exchange Rate, $K_{AB} \to \infty$</th>
<th>Floating Exchange Rate, $K_{AB} = 0$</th>
<th>Fixed Exchange Rate, $K_{AB} \to \infty$</th>
<th>Fixed Exchange Rate, $K_{AB} = 0$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure Increase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{dr}{dA} = 0$</td>
<td>$\frac{dr}{dA} &gt; 0$</td>
<td>$\frac{dr}{dA} = 0$</td>
<td>$\frac{dr}{dA} &gt; 0$</td>
</tr>
<tr>
<td>$\frac{dY}{dA} = 0$</td>
<td>$\frac{dY}{dA} &gt; 0$</td>
<td>$\frac{dY}{dA} &gt; 0$</td>
<td>$\frac{dY}{dA} = 0$</td>
</tr>
<tr>
<td>$\frac{de}{dA} &lt; 0$</td>
<td>$\frac{de}{dA} &gt; 0$</td>
<td>$\frac{de}{dA} = 0$</td>
<td>$\frac{de}{dA} = 0$</td>
</tr>
<tr>
<td>$\frac{dT}{dA} &lt; 0$</td>
<td>$\frac{dT}{dA} = 0$</td>
<td>$\frac{dT}{dA} &lt; 0$</td>
<td>$\frac{dT}{dA} = 0$</td>
</tr>
<tr>
<td>Money Supply Increase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\frac{dr}{dM^z} = 0$</td>
<td>$\frac{dr}{dM^z} &lt; 0$</td>
<td>$\frac{dr}{dM^z} = 0$</td>
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</tr>
<tr>
<td>$\frac{dY}{dM^z} &gt; 0$</td>
<td>$\frac{dY}{dM^z} &gt; 0$</td>
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<td>$\frac{dT}{dM^z} &gt; 0$</td>
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<td>$\frac{dT}{dM^z} = 0$</td>
<td>$\frac{dT}{dM^z} = 0$</td>
</tr>
</tbody>
</table>
3.6.3 Limitations and Extensions of the MF Model

There are a number of problems with the MF specifications of both the real and financial sides of the economy. Taken together these shortcomings and inconsistencies limit its usefulness as a guide for macroeconomic policy and as a vehicle for understanding the nature and significance of external account determination. These limitations can be traced to the underlying assumptions of the basic MF model, many of which have been addressed piecemeal in the open economy literature.

Goods Market Specification

Starting with the goods side, the heart of traditional Keynesian analysis, the model implicitly assumes all goods are internationally tradable and the economy is small. However, domestic producers and consumers are not price takers in the dependent economy sense which is somewhat unrealistic for many small economies, including Australia, where in fact many goods, particularly tradable commodities, are highly substitutable for foreign goods. In contrast, the model asymmetrically specifies that in financial markets, domestic and foreign bonds may be perfect substitutes under the perfect capital mobility assumption, ignoring the possibility of international interest risk premia.

Moreover, the standard MF assumption that exports are autonomous with respect to national income does not allow exports to be negatively related to absorption, \( \left( \frac{\partial X}{\partial A} < 0 \right) \) as implied by the dependent economy approach. The autonomous exports assumption seems implausible since increased domestic expenditure not only means more spending by households, firms and government on goods produced abroad, showing up as higher imports, but should also mean increased spending on goods produced at home, including goods otherwise destined for sale to foreigners. To assume exports are autonomous
implies the domestic income elasticity of demand for exportables is zero which seems unlikely.

The simple Keynesian consumption function included in the basic model is of course subject to all the criticisms and alternative specifications such as the relative, permanent and life cycle hypotheses expounded in the closed economy literature, (for example, see Duesenberry (1949), Friedman (1957), Ando and Modigliani (1963), Modigliani (1970), Hall (1978), Hubbard and Judd (1986), Nelson (1987) and Abel (1990)) a survey of which falls outside the scope of this critique. Likewise, the closed economy literature contains alternative, more sophisticated investment functions, than that proposed in the standard MF model, (for example, see Grossman (1972), Hayashi (1982), Hirschleifer (1958), Jorgenson (1974), Tobin (1969) and Abel (1990)) some of which have open economy analogues to be considered in the next chapter.

With respect to the impact of government spending and tax ing on total expenditure, the MF model implies that activist fiscal policies can be easily implemented, without acknowledging the practical policy complications which arise because of lags due to delays in perceiving changed economic circumstances and to institutional impediments which frustrate speedy implementation of discretionary budgetary changes.

*Ricardian Equivalence*

The model, particularly in its "twin deficits" guise, is also subject to the ambiguities raised by the Ricardian Equivalence (RE) proposition (see Barro (1974, 1979) and Corden (1991)). David Ricardo originally proposed that tax or bond financing of government expenditure were equivalent in their effects on private consumption spending. Essentially, in generalised form the RE proposition is based on individuals' private
perceptions of government bonds held in their investment portfolios. An increase in bonds held does not imply an increase in wealth since bonds also represent the future obligation of the government which the private sector will ultimately have to meet through higher taxes. An increase in public debt outstanding as a result of higher budget deficits arising from either increased government spending or reduced taxes should therefore lead to higher private saving in preparation for the future tax burden. If private agents care as much about their descendants' economic welfare as their own, it does not even matter if the future taxes will not be levied in their own lifetime.

This proposition in its strict form suggests that the scope for active fiscal policy is non existent. Contrary to the traditional Keynesian approach, which asserts that individuals treat tax cuts like any other form of income, budgetary measures intended to stimulate private spending would be immediately offset by reduced spending as economic agents recognize that fiscal expansion, budget deficits and higher public debt levels imply future tax increases. In terms of the IS–LM–BP diagram, the RE proposition suggests that government attempts to shift the IS curve prove futile, thus eliminating any link between the public and external accounts.

There is a sizeable international literature on the theoretical and empirical validity of the RE proposition which remains fairly inconclusive in the sense that some authors find support for the proposition while others perhaps in the majority do not. See for instance Buchanan (1976), O'Driscoll (1977), Kochin (1974), McCallum (1984), Weil (1987), Yotsuzuka (1987), Leiderman and Blejer (1988), Poterba and Summers (1987), Barro (1989), Bernheim (1989). Although the RE proposition in its strict form negates the "twin-deficits" application of the MF model, it seems plausible that practical considerations suggest a weak link between the deficits, to the extent that agents have
incomplete information or less than rational expectations. Indeed, it may even be rational for some agents to expect future tax increases not to apply to them personally and hence not adjust their behaviour. Furthermore, there is the possibility of reverse causality between the public and external accounts contrary to the line of causality proposed by the "twin-deficits" hypothesis. For example, in the event of a foreign financed private investment boom, the CAD would rise but, other things equal, the budget deficit would tend to surplus as tax revenue increased because of rising incomes.

Furthermore, as argued by Nguyen (1989), it is also important to distinguish between whether fiscal-induced income rises are considered permanent or transitory by households since this affects short run private consumption behaviour. If income rises are deemed transitory for instance, the change in the private saving–investment imbalance to income ratio becomes ambiguous and the linkage between the budget and external deficit would be further weakened if the ratio falls.

Omission of Output and Price Level Dynamics

Another unrealistic assumption of the basic MF model is that the price level is fixed. This deficiency has however been addressed by Argy and Salop (1979) and Branson and Buiter (1983) who allow exchange rate changes to affect the price level and hence real balances with feedback effects on the real sector, thus modifying but not substantially changing the standard conclusions of the approach. Relatedly, the implicit assumption of the basic MF model that aggregate supply is perfectly elastic has been relaxed by Buiter and Miller (1981a, 1981b), Buiter and Purvis (1983), Bruce and Purvis (1985) and Scarth (1988). For instance, Bruce and Purvis (1985) demonstrate that the standard policy ineffectiveness results are still valid only if nominal wages are rigid;
otherwise with variable wages and a changing price level there are associated supply side
effects which, with perfect capital mobility, can render monetary policy ineffective but
make fiscal policy effective under floating rates.

Despite recognizing the need for a supply side and changing price level, these
extended MF models continue, however, to constrain the output and expenditure
aggregates of the national accounts to the same value, in and out of equilibrium, contrary
to the absorption related approaches. Notwithstanding the extensions which have been
proposed, the MF approach therefore still basically rests on a simplistic, ad hoc
formulation of the external accounts. As expressed in equation (10) above, the trade
account and capital flows are treated only partially and remain distinct from the rest of the
national accounts and flow of funds accounts. The accounting foundations of the MF
model are weak and bear little relation to the total national accounting and flow of funds
framework of Chapter 2. The flow of funds framework in particular suggests that models
of the external accounts should not divorce real and financial flows irrespective of the
time period under analysis. In short, the extensive literature spawned by the original MF
model does not recognize that real and sectoral financial flows are indeed inseparable,
implying that both the current and capital accounts may be determined simultaneously by
a common set of economic influences.

Financial Market Specification

A more specific shortcoming of the financial specification of the basic MF model
concerns the inconsistency between having a flow equilibrium condition for the capital
account, which underlies the BP curve, and the stock equilibrium condition in the
domestic money market, which underlies the LM curve. Indeed, the model expects us to
accept that the stock demand and supply of money in the domestic money market is invariant in final equilibrium, yet that simultaneously the net foreign investment position and hence the stock of financial and real wealth are changing, consistent with capital flow equilibrium. The model also neglects the extent to which capital flows may finance domestic investment as well as the possibility that rising external indebtedness consequent upon capital inflows may check the equilibrium capital inflow, should it affect a nation's international creditworthiness.

In treating capital flows simply as purchases and sales of debt instruments, the MF model also omits foreign purchases of equities (row 5 of Figure 2.4) or indeed other real assets such as property which may often account for a significant portion of total capital flows. Foreign claims to real domestic assets may also help explain the process of real international capital transfer as argued in the next chapter.

Turning to the specification of the domestic money market, both the MF, PB and indeed monetary approaches commonly argue that domestic interest rates are determined by the interaction between the stock demand for money and the stock supply of money. This stock perspective on domestic interest rate determination has been questioned by Tsiang (1989), citing Keynes (1937) and Tobin (1982) (both early proponents of the stock approach) in support. Tsiang argues that the loanable funds approach to interest rate determination, a flow perspective, provides a suitable alternative to the traditional stock approach.

The loanable funds approach, earlier advocated by Robertson (1940), but with antecedants in pre-Keynesian theory, asserts that the domestic interest rate is essentially determined at any time by the prevailing supply and demand for loanable funds, in a financial system where funds are endlessly exchanged in a circular flow. Since we are
mainly concerned with the determination of external account flows, particularly in the context of an integrated real and financial accounting system, the loanable funds approach, with suitable extension to the open economy, suggests a different perspective on the current and capital accounts. An extended loanable funds approach will be outlined in the next chapter.

The basic MF model also fails to account for exchange rate expectations which are implicitly assumed static. Dornbusch (1976a) addressed this omission by allowing forward looking expectations about the exchange rate to drive a wedge between domestic and foreign interest rates through the uncovered interest parity condition. By allowing asset prices to adjust more quickly than goods prices, Dornbusch's MF foundations emphasize the stickiness of prices in goods markets, in order to model the phenomenon of exchange rate overshooting. However, the purpose of the Dornbusch–MF overshooting model was not to consider the dynamics of the external accounts, but of the exchange rate to explain observed exchange rate volatility. In this way, it provided an alternative to the monetary approach to exchange rate determination. Another feature of the Dornbusch exchange rate model was its demarcation between short run and long run effects of monetary expansion. This distinguished the model from the earlier MF literature which was only concerned with short run adjustment issues.

**Specification of External Accounts**

Returning to the specification of the external accounts in the MF model, a further deficiency on this score is its failure to recognize the often quantitatively significant income and transfers sub-account of the current account which arises because capital inflows require servicing, particularly through interest obligations often payable
immediately. In turn, growth in such payments widens the gap between national output and income according to national accounting principles, yet this crucial distinction is not normally drawn in comparative static applications of the basic MF model.

Nor does the MF model, in which the external accounts are expressed in domestic currency terms, recognize that changes in competitiveness arising from nominal exchange rate movements cause valuation effects for the current account of the sort discussed in Chapter 2. Relatedly, there are no J curve effects. This is because there are no export or import adjustment lags and the export and import demand elasticities are presumed to fulfill the Marshall–Lerner condition, such that depreciations quickly raise net exports whereas appreciations lower them. However, as Krugman (1989) argues, increased uncertainty about the sustainability of capital account driven depreciations is likely to frustrate any rise in net exports under a floating exchange rate regime. In particular, the link between depreciations and trade flows is likely to be weak or indeed non-existent because producers of exports and consumers of imports may quite rationally expect the exchange rate to rebound quickly and fully in the absence of any true or accepted model of short run exchange rate determination. This is of course as much a criticism of the relevance of the original elasticities approach as it is of the incorporation of the Marshall–Lerner condition in the MF model. It is also a criticism of the naive capital flow model of exchange rate determination in the MF model.

Even if we put aside the exchange rate uncertainty argument, but acknowledge valuation effects and J curves, a widened CAD must, according to accounting convention, be matched by capital inflow sufficient to match the increased CAD. In other words, if the widened CAD arises in the first instance because of a depreciation induced by capital
outflow, there would then have to be an immediate reversal of capital outflow to capital inflow.

Dornbusch (1976b) has also shown that, notwithstanding fulfilment of the Marshall–Lerner condition, expansionary monetary policy under floating rates may widen an existing CAD if expectations are modelled as regressive. (See also Niehans (1975)). This is because with regressive expectations, the fall in domestic interest rate following an increase in the money supply may lead to an increase in imports as aggregate demand increases. This income effect may therefore increase the trade deficit by more than a depreciation lowers it.

**Neglect of Real Capital Accumulation**

A more fundamental difficulty with the MF paradigm however is that it ignores the effect of foreign investment flows on the domestic capital stock, in much the same way as closed economy Keynesian models neglect the impact of domestic investment flows on the capital stock. In the closed economy case, allowing investment to matter for aggregate demand in the short run, but not matter for aggregate supply, has been justified on the grounds that while the purchase of capital goods immediately increases aggregate demand, it takes longer, because of installation lags, for the aggregate supply side effects to become evident (Scarth (1988)). Furthermore, it is argued that supply side effects may be ignored because annual investment spending is a more significant portion of expenditure than of the existing capital stock.

However, these reasons for neglecting the supply side effects of investment can be challenged on the grounds that it seems quite unrealistic to assume that newly purchased, fully assembled capital equipment is rarely put to immediate use. Moreover, the
suggestion that investment spending is not that significant relative to the value of the existing capital stock ignores the possibility that the most recently accumulated real capital is likely to have a higher marginal productivity than the pre-existing capital stock. Aggregate output or supply could also fall in the absence of replacement capital which is recorded in gross investment flows.

3.7 Conclusion

Although the MF model highlights the macroeconomic significance of the movement of international financial capital, it fails to embed these international financial flows adequately into real macroeconomic relationships relating domestic and foreign investment, domestic capital accumulation, rates of return on real capital and national income. Nor does it make saving and investment decisions central to external account determination.

National accounting however dictates that net capital inflow over any period can only occur if there has been a corresponding change in the nation’s saving–investment imbalance, and relative wealth levels, the principal determinants of which should be explained in any general equilibrium model with reference to common real factors. Hence the emphasis in MF genus models on capital flows as purely financial phenomena, not directly tied to real phenomena, or intertemporal forces seems incomplete.

Financial capital flows as recorded in the capital account are not independent of the process of real international capital transfer, yet the MF model fails to capture this. On the other hand, output and expenditure decisions can indeed be independent of each other, as stressed by the absorption approaches, yet the MF model implies the opposite. In defence of the MF model, it may of course be argued that it was never designed to explain
external account determination, but instead provides a starting point for analysing short run responses in income and exchange rates.

It is the purpose of the next chapter to survey and extend alternative approaches based on the accounting notion of the external imbalance as a nation's saving–investment imbalance. Such a perspective addresses many of the basic deficiencies of the MF and earlier approaches outlined above but which still pervade much of the recent literature on the external accounts.
Appendix 3.1

Derivation of Elasticities Approach

The elasticities approach addressed the conditions necessary for devaluations to improve trade balances. These necessary conditions can be derived as follows:

The change in the trade balance is expressed as

\[ dT^* = dX^* - dM^* \]

(A.3.1.1)

where asterisks here denote foreign exchange values.

Starting with the export side of the trade account, \( X^* \) can be further expressed as

\[ X^* = Q_x P^*_x \]

(A.3.1.2)

where \( Q_x \) is the volume of exports and \( P^*_x \) is the foreign price of exports. If \( e \) is the price of foreign exchange, then

\[ P^*_x = eP_x \]

(A.3.1.3)

where \( P_x \) is the domestic price of exports.

The elasticity of supply of exports with respect to price is

\[ \varepsilon_x = \frac{dQ_x}{Q_x} / \frac{dP_x}{P_x} \]

(A.3.1.4)

and the elasticity of demand for exports on the part of foreigners is

\[ \eta_x = \frac{-dQ_x}{Q_x} / \frac{dP^*_x}{P^*_x} \]

(A.3.1.5)
From (A.3.1.3),

\[
\frac{dP_x}{P_x} = \frac{de}{e} + \frac{dP^*_x}{P^*_x} \tag{A.3.1.6}
\]

Substituting (A.3.1.6) into (A.3.1.4), we obtain

\[
\varepsilon_x = \frac{dQ_x}{Q_x} \left( \frac{dP^*_x}{P^*_x} + \frac{de}{e} \right) \tag{A.3.1.7}
\]

Using (A.3.1.5) we also obtain

\[
\frac{dQ_x}{Q_x} = -\frac{\eta_x}{P^*_x} dP^*_x \tag{A.3.1.8}
\]

Substituting (A.3.1.8) into (A.3.1.7)

\[
\frac{dP^*_x}{P^*_x} = \left( \frac{-\varepsilon_x}{\eta_x + \varepsilon_x} \right) \frac{de}{e} < 0 \tag{A.3.1.9}
\]

Substituting (A.3.1.9) back into (A.3.1.5)

\[
\frac{dQ_x}{Q_x} = \left( \frac{\eta_x \varepsilon_x}{\eta_x + \varepsilon_x} \right) \frac{de}{e} > 0 \tag{A.3.1.10}
\]

The proportionate change in the value of exports is

\[
\frac{dX^*}{X^*} = \frac{dP^*_x}{P^*_x} + \frac{dQ_x}{Q_x} \tag{A.3.1.11}
\]
Substituting from (A.3.1.9) and (A.3.1.10) yields

\[
\frac{dX^*}{X^*} = \frac{\varepsilon_x(\eta_x - 1)}{(\eta_x + \varepsilon_x)} \, de
\]  

(A.3.1.12)

On the imports side, the foreign currency value of imports is

\[
M^* = Q_M P_M^*
\]  

(A.3.1.13)

where \(Q_M\) is the volume of imports and \(P_M^*\) is the foreign price of imports. The domestic price of imports,

\[
P_M = eP_M^*.
\]  

(A.3.1.14)

The elasticity of supply of imports with respect to price is

\[
\varepsilon_M = \frac{dQ_M}{Q_M} / \frac{dP_M^*}{P_M^*}
\]  

(A.3.1.15)

The elasticity of demand for imports domestically is

\[
\eta_M = \frac{-dQ_M}{Q_M} / \frac{dP_M}{P_M}
\]  

(A.3.1.16)

From (A.3.1.14),

\[
\frac{dP_M}{P_M} = \frac{dP_M^*}{P_M^*} + de
\]  

(A.3.1.17)
Substitute (A.3.1.17) into (A.3.1.16)

\[ \eta_M = \frac{-dQ_M}{Q_M} \left( \frac{dP_M^*}{P_M} + \frac{de}{e} \right) \]  

(A.3.1.18)

From (A.3.1.15)

\[ \frac{dQ_M}{Q_M} = \varepsilon_M \frac{dP_M^*}{P_M^*} \]  

(A.3.1.19)

Substitute (A.3.1.19) into (A.3.1.18), we obtain

\[ \frac{dP_M^*}{P_M^*} = \frac{-\eta_M}{\eta_M + \varepsilon_M} \frac{de}{e} \]  

(A.3.1.20)

Using (A.3.1.20) in (A.3.1.15) and solving for the proportionate change in the quantity of imports,

\[ \frac{dQ_M}{Q_M} = \frac{-\varepsilon_M \eta_M}{\varepsilon_M + \eta_M} \frac{de}{e} \]  

(A.3.1.21)

Now the proportionate change in the value of imports is

\[ \frac{dM^*}{M^*} = \frac{dP_M^*}{P_M^*} + \frac{dQ_M}{Q_M} \]  

(A.3.1.22)

Substituting from (A.3.1.20) and (A.3.1.21)

\[ \frac{dM^*}{M^*} = \frac{\eta_M (\varepsilon_M + 1)}{\varepsilon_M + \eta_M} \frac{de}{e} \]  

(A.3.1.23)
Substituting the expressions in terms of elasticities derived for proportionate changes in exports, \( (A.3.1.12) \), and proportionate changes in imports, \( (A.3.1.23) \), into equation \( (A.3.1.1) \)

\[
dT^* = \left[ X^* \cdot \frac{\varepsilon_x(\eta_x - 1)}{(\eta_x + \varepsilon_x)} + \frac{\eta_M(1 + \varepsilon_M)}{(\eta_M + \varepsilon_M)}\right] \frac{de}{e} \tag{A.3.1.24}
\]

With balanced trade, \( X^* = M^* \), so that a devaluation \( \left( \frac{de}{e} \right) \) only improves the trade balance if

\[
\frac{\varepsilon_x(\eta_x - 1)}{(\eta_x + \varepsilon_x)} + \frac{\eta_M(1 + \varepsilon_M)}{(\eta_M + \varepsilon_M)} > 0 \tag{A.3.1.25}
\]
Appendix 3.2

Comparative Statics and Stability Analysis of the MF Model Under Floating Exchange Rates

This appendix examines the mathematics of the comparative statics as well as stability analysis of the MF model under floating exchange rates with varying degrees of capital mobility.¹

Comparative Statics

Goods market equilibrium may be written as the condition that total injections equal leakages.

\[ \bar{A} + I(r) + X(e) = S(Y) + M(Y,e) \]  

(A.3.2.1)

where \( I, < 0, X > 0, 0 < S, < 1, 0 < M, < 1, M_e < 0. \)

\( \bar{A} \) denotes total autonomous expenditure including private and public consumption and private and public investment expenditure; the other variables are as defined in Chapter 2.

Money market equilibrium is given by the stock equality of real money demand (L) and the real money supply (\( M' \)).

\[ M' = L(Y,r) \]  

(A.3.2.2)

\[ L_y > 0, L_r < 0 \]

The external accounts under a floating exchange rate can be expressed as

\[ B = X(e) - M(Y,e) + KAB(r) = 0 \]  

(A.3.2.3)

Total differentiation of equations (A.3.2.1), (A.3.2.2) and (A.3.2.3) yields, after some rearrangement, the following matrix:

¹ Dernburg (1989: 203–208) adopts a similar approach.
The coefficient matrix may be inverted to yield

\[
\begin{bmatrix}
S_y + M_y & -I_r & (M_e - X_e) \\
L_y & L_y & 0 \\
M_y & -KAB_r & (M_e - X_e)
\end{bmatrix}
\begin{bmatrix}
dY \\
dr \\
de
\end{bmatrix}
= 
\begin{bmatrix}
d\bar{A} \\
dM^*
\end{bmatrix}
\]

where the determinant of the co-efficient matrix,

\[D = (M_e - X_e)(L_y - L_yKAB_r + I_yL_y) > 0\]

a) increased autonomous expenditure

It follows that the multipliers for a change in autonomous expenditure are

\[\frac{dY}{d\bar{A}} = \frac{L_y}{L_yS_y - L_yKAB_r + I_yL_y} > 0\]

\[\frac{dr}{d\bar{A}} = \frac{-L_y}{L_yS_y - L_yKAB_r + I_yL_y} > 0\]

\[\frac{de}{d\bar{A}} = \frac{-(L_yKAB_r + L_yM_y)}{(M_e - X_e)(L_yS_y - L_yKAB_r + I_yL_y)} > 0. \text{ This is ambiguous since } L_yKAB_r,\]

is positive and \(L_yM_y\) is negative.
The above results suggest that an increase in autonomous expenditure, including increased public spending due to discretionary fiscal expansion raises both the equilibrium level of income and interest rate. The effect on the exchange rate is ambiguous. If financial capital flows are perfectly mobile in the MF sense, $K_{ABr} \to \infty$. Hence, the above multipliers under floating exchange rates reduce to

\[
\frac{dY}{dA} = 0
\]

\[
\frac{dr}{dA} = 0
\]

\[
\frac{de}{dA} = \frac{1}{M_e - X_e} < 0
\]

Therefore under floating exchange rates, increased autonomous expenditure is ineffective in raising national income but appreciates the exchange rate.

Alternatively, if financial capital is completely immobile, $K_{ABr} = 0$, and the multipliers reduce to

\[
\frac{dY}{dA} = \frac{L_r}{L_r S_y + I_r L_y} > 0
\]

\[
\frac{dr}{dA} = \frac{-L_y}{L_r S_y + I_r L_y} > 0
\]

\[
\frac{de}{dA} = \frac{-L_r M_y}{(M_e - X_e)(L_r S_y + I_r L_y)} > 0
\]
Modifying the perfect capital mobility assumption therefore allows autonomous expenditure increases to impact positively on income and the domestic interest rate.

b) monetary expansion

From the matrix, the multipliers from a monetary expansion reduce to

\[
\frac{dY}{dM^*} = \frac{I_r - KAB_r}{L_yS_y - L_yKAB_r + I_yL_y} > 0
\]

\[
\frac{dr}{dM^*} = \frac{S_y}{L_yS_y - L_yKAB_r + I_yL_y} < 0
\]

\[
\frac{de}{dM^*} = \frac{KAB_r(S_y + M_y) - I_yM_y}{(M_e - X_e)(L_yS_y - L_yKAB_r + I_yL_y)} > 0
\]

Hence expansionary monetary policy raises equilibrium income, lowers the domestic interest rate and depreciates the exchange rate.

With perfect capital mobility, \( KAB_r \rightarrow \infty \), the multipliers are

\[
\frac{dY}{dM^*} = \frac{1}{L_y} > 0
\]

\[
\frac{dr}{dM^*} = 0
\]

\[
\frac{de}{dM^*} = \frac{S_y + M_y}{-(M_e - X_e)L_y} > 0
\]
This suggests that monetary policy is effective in raising income and depreciating the exchange rate, but that perfect capital mobility ensures the domestic interest rate does not change.

Again varying the capital mobility assumptions, if $KAB_r = 0$, the multipliers reduce to

$$\frac{dY}{dM} = \frac{I_r}{L_s S_y + I_r L_y} > 0$$

$$\frac{dr}{dM} = \frac{S_y}{L_s S_y + I_r L_y} < 0$$

$$\frac{de}{dM} = \frac{-I_r M_y}{(M_e - X_e)(L_s S_y + I_r L_y)} > 0$$

Under these conditions, monetary expansion raises equilibrium income, lowers the domestic interest rate and depreciates the exchange rate.

**Stability Analysis**

Stability analysis concerns the time paths of variables when the economy is out of equilibrium. To conduct stability analysis it is therefore necessary to make assumptions about how the key variables in the MF model behave when away from their equilibrium values. Accordingly, the above version of the MF model may be expressed in dynamic terms as

$$\frac{dY}{dt} = \alpha_1[\bar{I} + I(r) + X(e) - S(Y) - M(Y,e)]$$

(A.3.2.4)
Equation (A.3.2.4) suggests that income adjustment is proportional to the gap between injections (autonomous expenditure, interest sensitive investment and exports) and leakages (saving and imports). The speed of adjustment is determined by reaction co-efficient $\alpha_1$.

Equation (A.3.2.5) implies that if real money demand rises above the real money supply then the interest rate rises at a rate determined by reaction co-efficient $\alpha_2$.

Equation (A.3.2.6) states that the exchange rate appreciates at a speed governed by reaction co-efficient $\alpha_3$ as capital inflow exceeds net exports. The above implicit functions can be replaced with linear approximations in the neighbourhood of equilibrium, such that the equations may be re-written in linear homogeneous form as

$$\frac{dY}{dt} = \alpha_1[-(S + M)(Y - \bar{Y}) + I_s(r - \bar{r}) + (M - X)(e - \bar{e})]$$

$$\frac{dr}{dt} = \alpha_2[L_y(Y - \bar{Y}) + L_r(r - \bar{r})]$$

$$\frac{de}{dt} = -\alpha_3[-M_s(Y - \bar{Y}) + KAB_s(r - \bar{r}) - (M - X)(e - \bar{e})]$$

where $\bar{Y}, \bar{r}, \bar{e}$ denote final equilibrium values.
Solutions to these differential equations must express the values of the variables as functions of time and be of the form

\[ Y = \bar{Y} + \beta_1 E^q \] (A.3.2.7)

\[ r = \bar{r} + \beta_2 E^q \] (A.3.2.8)

\[ e = \bar{e} + \beta_3 E^q \] (A.3.2.9)

where \( E \) is the exponential. If \( Y, r, e \) approach their equilibrium values \( \bar{Y}, \bar{r}, \bar{e} \), the system is stable and for this to occur the term \( q \) (the characteristic root) must be negative for the dynamic component of the right hand expression to approach zero through time.

Differentiating equations (A.3.2.7), (A.3.2.8) and (A.3.2.9) with respect to time yields

\[ \frac{dY}{dt} = q\beta_1 E^q = q(Y - \bar{Y}) \]

\[ \frac{dr}{dt} = q\beta_2 E^q = q(r - \bar{r}) \]

\[ \frac{de}{dt} = q\beta_3 E^q = q(e - \bar{e}) \]

Substituting \( q(Y - \bar{Y}), q(i - \bar{i}) \) and \( q(e - \bar{e}) \) for \( \frac{dY}{dt}, \frac{dr}{dt}, \frac{de}{dt} \) respectively

yields the matrix equation.

\[
\begin{bmatrix}
  q + \alpha_1(S_y + M_y) & -\alpha_1I_y & \alpha_1(M_e - X_e) \\
  -\alpha_2L_y & q - \alpha_2L_y & 0 \\
  -\alpha_3M_y & \alpha_3K\bar{A}B & q - \alpha_3(M_e - X_e)
\end{bmatrix}
\begin{bmatrix}
  Y - \bar{Y} \\
  r - \bar{r} \\
  e - \bar{e}
\end{bmatrix} = 0
\]
The characteristic matrix cannot have an inverse, otherwise displacements from
equilibrium would be zero. The characteristic equation derived from the characteristic
determinant is

\[ q^2 + [\alpha_1(S_y + M_y) - \alpha_2 L_e + \alpha_3(M_e - X_e)]q^2 + [-\alpha_1 \alpha_2 L_e (S_y + M_y) - \alpha_1 \alpha_3 (S_y + M_y)] \\
(M_e - X_e) + \alpha_2 \alpha_3 L_e (M_e - X_e)] + \alpha_1 \alpha_2 \alpha_3 (M_e - X_e)(L, S_y - L, KAB_e + I, L_y) = 0 \\
\]

All coefficients must be positive for stability to obtain. Since \( S_y, M_y \) and \( I_e \) are positive
and \( L_e \) and \( I_e \) are negative, this condition is met provided that exchange depreciation
reduces net imports (i.e. \( M_e - X_e < 0 \)) in accordance with the Marshall–Lerner condition.
4.1 Introduction

In broad terms, the traditional approaches to the external accounts surveyed in Chapter 3, particularly the elasticities, absorption, and MF approaches stress expenditure and competitiveness as the chief determinants of the current account and restrict attention to the short run implications of changing net exports of goods and services. Though the capital account plays a role in the MF approach, financial capital flows are not related to the real capital stock in any direct way. Indeed, a common factor uniting the earlier approaches is the general neglect of capital theory and the notion that there may be welfare gains from international trade in saving.

In contrast, this chapter brings capital theory to the forefront of the analysis of the open economy and external account determination. It reconciles a completely different set of international macroeconomic approaches to the theory of cross border capital movements by combining aspects of production, trade and finance theory. By focussing on the linkages between saving, domestic investment and foreign investment, it thus provides a sounder basis for understanding external account determination in light of the aggregate accounting foundations of Chapter 2 and allows us to highlight some important theoretical results which are central to later chapters. A primary aim is to demonstrate the macroeconomic gains from foreign investment by comparing the extreme cases of full capital mobility and capital immobility. This contrasts with the comparison between perfect capital mobility and capital immobility in the MF model.
The chapter proceeds as follows. First, the macroeconomic welfare gains from foreign investment and the relationship between capital, output, the standard of living and the external accounts are interpreted in the context of traditional foreign investment theory which abstracts from monetary factors. Following that, financial markets are introduced explicitly to further explain the process of international capital transfer. Then the intertemporal, or Fisherian, model is outlined, an approach which allows aggregate demand or absorption to change independently of aggregate supply or output. After this, some extensions to the intertemporal approach, including offer curve analysis, are presented. Finally, the intertemporal approach is reconciled with the accounting flow of funds, using a more general loanable funds framework to link saving, investment and the external accounts. Before concluding the chapter, some limitations of the capital-theoretic approaches are discussed.

4.2 Traditional Foreign Investment Approach

In parallel with the development of the MF and dependent economy models, a distinctly different, yet less widely adopted approach to the open economy emerged in the early 1960's, proposed by McDougall (1960) and Kemp (1964, 1966). Whereas the MF approach essentially stressed the aggregate demand side, this alternative approach stressed the supply side to explain the real macroeconomic effects of foreign investment from abroad on a host economy. It was based on neo-classical assumptions, including perfect competition in goods and factor markets, full employment, and no external economies in production. As well, it often assumed constant returns to scale. (See also Amano (1965), Borts (1964), Bardhan (1967), Neher (1970), Pitchford (1970), Onitsuka (1974), Negeshi (1975), Ruffin (1979), Grubel (1980) and Niehans (1984).)
4.2.1 The Basic Model

Following Niehans (1984), consider an economy whose real capital stock is small relative to the rest of the world's. In isolation, the economy's total gross output \( Y \) or aggregate supply of goods and services is determined by a macroeconomic production function, \( Y = f(K,L) \), where \( K \) is the gross value of the capital stock and \( L \) is labour effort. Only real capital is free to move internationally which allows us to abstract from the economics of migration. We also assume there is no domestic labour force growth.

Under competitive conditions in a closed economy whose initial capital stock is entirely owned by domestic residents, where markets clear instantly and where all output supplied is demanded, the return to capital will equal its marginal product:\[ f_k = \frac{\partial Y}{\partial K} > 0 \] and we assume \( f_{kk} < 0 \). Initial output equilibrium is OD in Figure 4.1 where the slope of the production function reveals the marginal return on capital. Aggregate gross income earned by capital is \( f_k K \) as shown by distance AD.

Now if the foreign rate of return on capital \( (r^*) \) is lower than \( f_k \), foreign investment \( (K^*) \) will eventually lead to an increase in the domestic capital stock to \( K_T \), where \( K_T = K + K^* \). Hence gross national output can be higher with foreign investment compared with autarky. B'C is paid to non-residents, so gross national income rises by CD'.

A more rigorous mathematical treatment of the long run dynamic impact of a move to full capital mobility on a small economy is contained in Appendix 4.1.

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1 If we allow for depreciation of the capital stock, the equilibrium return to capital becomes \( f_k - d \), where \( d \) is the depreciation rate. This follows because \( Y_a = f(K,L) - dK \) and with constant returns to scale \( Y_a = (f_s(K,L) - d_s)K + f_s(K,L)L \).
The basic model outlined above may now be extended by relaxing the assumption about an exogenous world interest rate. Consider for instance, the case where, through foreign investment, one economic region is large enough to exert some influence on the productivity of capital, output and income in the other. Assume the two regions simultaneously move from autarky and permit foreign investment. They have similar production functions as depicted in Figure 4.2 and the combined capital stock is shown by the length of the horizontal axis. Before free trade in real capital was permitted, economy A used its initial capital stock $O^A K^A$ to produce output equivalent to distance $O^A D$. Economy B used its relatively larger capital stock $O^B K^B$ to produce output equal to $O^B E$. 

Figure 4.1 - The Gains from Foreign Investment (a)
With full real capital mobility, there would be a tendency for equalisation of the real rate of return on capital across both regions. Capital would be transferred internationally until the marginal productivities of capital in the two regions are equalised, having fallen in A and risen in B. In final equilibrium, additional capital accumulation in region A ($K^*$) through imports is matched by decumulation in region B through exports. Combined output rises by LM, or equivalently from $O_B$ to $W$. Had the autarky equilibrium for each region initially been at $Q$, the balances in the external accounts would have been reversed after allowing free trade in capital, with region B becoming the capital importer instead of A.

Though the neoclassical approach to foreign investment neglects the monetary implications of different exchange rate regimes as well as the balance of payments as such, it usefully illustrates the welfare gains from real capital transfers. In short, it reveals the benefits of full capital mobility over zero capital mobility where capital mobility is understood in a quite different sense to the MF approach.

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2 Conventional trade theory concludes that under certain conditions, including constant returns to scale, factor price equalisation can occur from trade in goods alone, without any trade in factors. Hence, across border equality of marginal products can exist before allowing capital movements.

3 This assumes of course that in the home country there is no production of capital for foreign investment abroad.
4.2.2 Some Comparative Statics

To further elucidate the linkages between foreign investment, national output and national income emphasized in the later discussion of Chapter 5 and the empirical work of Chapter 6, we will consider two comparative static exercises under the full real capital mobility assumption – an increase in domestic investment opportunities and an exogenous increase in the supply of foreign capital. Both forms of disturbance to some extent influenced Australia’s external accounts in practice in the 1980’s. First consider Figure 4.3 which adapts the framework used by Grubel (1987).
In the figure, total wealth equals the combined capital stock throughout and in initial equilibrium with full capital mobility, the return on capital is \( r_1 \). Since competition ensures the return on capital is the value of its marginal product, it follows that the value of A’s gross output is the hatched area whereas gross output in B is the dotted area.

![Figure 4.3 - An Increase in Domestic Investment Opportunities](image)

Following an increase in investment opportunities in A, domestic demand for capital \((I^A)\) would shift out. If foreign investment was prohibited, the return on country A’s capital stock would rise to \( r_1 \). However, with fully mobile real capital, it only rises to \( r_1^{11} \) which, when reached, is a Pareto optimum.

In the fully mobile case, greater investment opportunities in A generate capital imports of FG in the transition to the new equilibrium and equivalent capital exports for B. A continues importing real capital willingly exported by B, up to the point where the return on capital in both regions is again equalised.
What of the income effects? Interestingly, the free trade in real capital allows A and B's national income to be higher than otherwise, even though A's national output actually expands while B's contracts. The value of real income transfers eventually recorded as a debit item on A's current account is FBDG, the same amount accredited on B's current account. With full capital mobility, A's output is FCDG higher and national income BCD higher than if capital mobility was zero, while B's national output is FADG lower with national income ABD higher. Again, foreign capital helps A produce more domestic output since it augments the capital stock on the aggregate supply side of the economy.

The creation of higher income out of a fixed level of wealth necessarily dictates a rise in capital imports matched by rising capital exports abroad. In sum, with changing domestic investment opportunities and fixed wealth in terms of capital goods, the greater is real capital mobility, the higher may be the income gains for both regions.

Consider now the effects on trade in capital of an exogenous increase in B's wealth which enlarges total regional wealth by $O^BO^B$ as shown in Figure 4.4. Using similar reasoning, it again becomes clear that both A and B share the income gains when free trade in capital is permitted. The extra wealth enables additional output in A (area ADGF) and in B. A gains through the trade by area ABD while B gains by more than otherwise (area BCD). Combined income is ADC higher. Such an external disturbance generates a capital trade deficit for A and an equivalent capital trade surplus for B.
Two remaining disturbances could be analysed in this simple comparative static framework – a relative rise in A's wealth or a relative rise in B's demand for capital. From an initial position of balanced trade, either disturbance would generate a trade surplus for A, matched by a capital trade deficit for B under the assumption of full real capital mobility.

4.2.3 Interest Rates and Financial Claims to Capital

So far, no mention has been made of financial claims to capital, since the analysis of the gains from foreign investment has been strictly in real terms. By introducing financial claims to capital however, we can now shed further light on the dynamics of
capital transfer across national borders with unrestricted foreign investment. As in the traditional foreign investment approach without financial claims, it is assumed that in the home country, foreign capital is not produced specifically for deployment abroad.

As proposed by Niehans (1984), all capital income may be in the form of dividends paid on equities \( q \), each one of which represents a claim to a unit of a country's capital stock. The yield is therefore \( r = f_q/q \). In initial autarky equilibrium, the market value of the capital stock \( q \) at home and abroad should be the same as its replacement cost \( \bar{q} \) in accordance with Tobin's \( q \) theory of investment. (See Tobin (1969), Tobin and Brainard (1977), Yoshikawa (1980), Hayashi (1982).)

If the replacement cost of capital goods is the same in the host economy as abroad, but initially \( \frac{f_k}{q} > \frac{f_{k*}}{q*} \), then the domestic yield on capital must be higher than the foreign yield. Foreign investors are now able to purchase domestic securities issued in the home country. Consistent with the theory of international trade in goods, free trade in financial capital, in the absence of uncertainty and transactions costs, will ultimately establish a common price, in this case the yield on capital, which will clear the unified markets.

With unrestricted foreign investment, the process of trade in financial claims immediately drives up the market value of the capital stock in the home country above replacement cost to equalise interest rates, thus eventually inducing the transfer of real capital from abroad i.e. \( r=r^* \Rightarrow q > \bar{q} \). In the final equilibrium, after unrestricted foreign investment has been allowed, \( q=\bar{q} \), but this may take some time given that real capital must be imported and installed. As additional units of capital are put into production, the domestic return on capital continues to fall since \( f_{kk} < 0 \). No further real capital is
imported when the market value of capital again equals its original replacement value, at which time the marginal product of capital is the same transnationally.

In the two region case of Figure 4.2, full capital mobility with financial claims means an initial increase in $q$ above replacement cost in country A, whose capital is relatively more productive, and a fall in $q$ in country B. The corresponding time paths of adjustment of the market values of claims to capital and the capital stock itself are shown in Figure 4.5. Given the initial accumulation and distribution of capital, the opening up at time $t_1$, of free trade in financial and real capital leads to a jump increase as $q$ rises in A and $q$ falls in B. As long as $q^A/q$ is greater than unity in A and $q^B/q$ is less than unity in B, capital will be exported by B and imported by A until the market value of capital again reflects its replacement value at time $t_2$.

![Time Paths for q and K](image)

Figure 4.5 – Time Paths for $q$ and $K$
4.3 **Intertemporal Approach**

In the above we examined the international macroeconomic consequences of liberalising foreign investment and demonstrated the welfare gains from full capital mobility. In the neoclassical approach however, the capital stock is simply determined by the given wealth level and as a single sector approach, it fails to allow for intersectoral borrowing and lending, consistent with the accounting flow of funds framework of Chapter 2. Nor does it allow for forward looking behaviour.


4.3.1 **The Basic Model**

In a two sector economy, comprised of households and firms, it can be assumed that aggregate output and expenditure are determined separately as in the earlier absorption approach of Chapter 3. Firms invest and combine labour, land, existing capital and given technology to produce maximum output over two periods of time (the present and the whole of the future), whereas households have preferences for present consumption ($C_1$) versus future consumption ($C_2$) and supply labour inelastically. Once again, we ignore capital stock depreciation.
Central to the intertemporal approach is the notion of an investment opportunities function \( f \) which transforms forgone present consumption (saving) into future output \( Y_2 \) through additional capital accumulation (investment \( I_t \)). The transformation curve is defined as \( F(Y_1, Y_2) \) and the intertemporal production function is of the form \( Y_2 = Y_1(K, L) + f(I_t) \). To fix ideas about the intertemporal approach, let us present some basic optimising conditions, initially in the closed economy context. These conditions form the basis for subsequent diagrammatic analysis for the open economy.

The economy's problem is to maximize its consumption or living standards \( l \) intertemporally, given present output and the available investment opportunities. The economy's utility function is therefore \( l(C_1, C_2) \). The present values of the future stream of output \( (Y_2) \) and consumption \( (C_2) \) are \( \frac{Y_2}{1+r} \) and \( \frac{C_2}{1+r} \) where \( r \) is the prevailing domestic interest rate. Output produced by firms over both periods, \( F(Y_1, Y_2) \), is maximized and the solvency condition for households is that income received over both periods is sufficient to fund the intertemporal consumption pattern i.e. \( Y_1 + \frac{Y_2}{1+r} = C_1 + \frac{C_2}{1+r} \). Hence if all of output produced by firms is consumed by households over the two periods, the problem becomes maximize the Lagrangean \( L(C, Y, \lambda) \):

\[
L(C_1, C_2, Y_1, Y_2, \lambda_1, \lambda_2) = l(C_1, C_2) + \lambda_1 \left( Y_1 + \frac{Y_2}{1+r} - C_1 - \frac{C_2}{1+r} \right) + \lambda_2 F(Y_1, Y_2)
\]

Then the first order conditions state

\[
D_1L = D_1l - \lambda_1 = 0 \quad (1)
\]

\[
D_2L = D_2l - \left( \frac{1}{1+r} \right) \lambda_1 = 0 \quad (2)
\]
From (1) and (2) it follows that for households

\[ \text{MRS} = \frac{D_1^L}{D_2^L} = 1+r \]

and for firms from (3) to (4)

\[ \text{MRT} = \frac{D_1^F}{D_2^F} = 1+r \]

Hence, MRS = MRT or the marginal rate of substitution of present for future consumption equals the marginal rate of transformation of present into future income.

4.3.2 Diagrammatic Analysis With Full Capital Mobility

With these results as a basis, we can again depict the welfare gains from foreign investment under conditions of full international capital mobility using a Fisherian framework. In Figure 4.6, if present period saving is zero, then in a certain world with unchanged production technology, output "endowed" in the future would be the same as in the present (as conveyed by the 45° line). With positive saving, however, the productive investment which abstinence allows yields higher future output and hence income, as determined by the investment opportunities frontier capturing domestic firms' ability to transform current income into future income. As in the previous neoclassical approach,
the marginal productivity of capital declines when more domestic capital is combined with the available supply of other resource inputs.

If capital is immobile internationally, the equilibrium return on capital for the economy would be determined by the intersection of investment opportunities and households' saving propensities. Hence, in equilibrium both the economy-wide return on capital and households' rate of time preference would equal the real interest rate. The slope of the investment opportunities curve and the consumption indifference curve would be $1+r$ at the point of tangency. Therefore, if nations' capital markets are isolated, the range of international interest rates would reflect the diversity of national saving propensities and investment opportunities.

However, with a move from zero capital mobility to full capital mobility, the correspondence between aggregate domestic saving and investment would be broken. The Fisher separation theorem, which suggests that financial markets enable consumption and investment decisions to be made independently, (see Fama and Miller (1972) and Fama (1976)) would therefore hold in an international macroeconomic setting. Moreover, in the absence of uncertainty, and abstracting from the complication of changing exchange rate expectations, domestic and foreign claims to real capital would become perfect substitutes. Through arbitrage, a small country's interest rate should equate with the prevailing world interest rate such that capital becomes perfectly mobile in the sense used earlier in the MF model. There are other measures of capital mobility, however, and the complete set of these conditions will be fully defined in the following chapter.
Figure 4.6 – Intertemporal Gains from Foreign Investment (a)
Figure 4.6 also illustrates the macroeconomic benefits of full capital mobility over zero mobility, yielding similar results to the neo-classical approach. If the autarky interest rate is initially higher than the world interest rate ($r^*$), full capital mobility necessarily creates a saving–investment imbalance, thus generating a KAS for the financially open economy. With reference to the figure, domestic capital formation rises by distance $KS$ since investment continues up to the point where the rate of return on capital equals the foreign interest rate.

The exact response of present consumption to interest rate changes is, however, a matter of some theoretical controversy. A fall in the interest rate makes current consumption less expensive relative to future consumption, discouraging saving – the substitution effect. On the other hand, the reduced income from interest receipts encourages households to save more – the income effect. Pre–Keynesian economists assumed the dominance of the substitution effect making current saving a rising function of the interest rate, but in theory this ambiguity cannot be resolved. (See Bailey (1957).

Assuming the dominance of the substitution effect, saving falls by distance $AS$, with point $E$ to the north east of the initial consumption point. If, however, the income effect dominated, the new consumption point would lie north west. In the case where the substitution and income effects offset, the new equilibrium would lie directly above the old. Foreign investment in the small country is matched by a collective CAS run by the rest of the world and is equivalent to distance $KA$ in the first period, the difference between domestic saving ($AV$) and domestic investment ($KV$).

Under the lower world interest rate regime, the equilibrium optimising condition is $\text{MRS} = \text{MRT} = 1+r^*$. Income and consumption both today and tomorrow can be higher than under zero capital mobility, again affirming that foreign investment under full capital
mobility improves the economy's standard of living. Provided initial expectations about the income producing potential of capital are fulfilled, future income will always be adequate to repay the external financial liabilities run up to finance the higher domestic capital accumulation. This is because geometrically, distance $OP$ in Figure 4.6 will exceed distance $OE$ as long as the interest rate is positive, since the slope of the budget line must then exceed unity (i.e. $\frac{OP}{OE} = 1 + r^* > 1$). In Chapter 6, we return to this variant of the intertemporal approach to focus explicitly on the stock adjustment effects of a move toward greater capital mobility.

The process of real capital transfer associated with the foreign investment recorded on the capital account is matched on the current account by either imported investment goods or imported consumption goods which release resources for domestic capital production. Since introducing intermediate goods would considerably complicate the analysis, we have implicitly assumed throughout that all goods are final goods.

As with the neoclassical approach, we can move from the small economy to the two region case, whereby interest rates become endogenously determined. Figure 4.7 shows the effects of integrating the capital markets of two previously autarkic regions with different investment opportunities and saving propensities. After allowing unrestricted foreign investment, arbitrage again ensures a single interest rate. Country A's initial interest rate falls and country B's rises. Living standards rise in both countries and the equilibrium condition is that $\text{MRS}_A = \text{MRS}_B = \text{MRT}_A = \text{MRT}_B = 1 + r^1$.

The external account triangles suggest that a move to full capital mobility from zero mobility creates capital inflow or a CAD of FG in country A matched by capital outflow or a CAS of IJ in B. To repay its international obligations in the future, economy A transfers EF income to B. Unambiguously, foreign investment under full capital
mobility raises living standards in both regions because the trade in saving allows households to reach higher levels of welfare compared with those possible in isolation i.e. for country A, $G>X$ and for country B, $H>Z$.

Figure 4.7 – Intertemporal Gains from Foreign Investment (b)

4.3.3 Offer Curve Analysis

The intertemporal approach to foreign investment provides a basis for introducing offer curves, usually only employed in the pure theory of international merchandise trade, to model the external accounts. Casting the intertemporal approach in terms of offer curves serves to highlight that, contrary to the approaches to the external accounts outlined
in Chapter 3, international trade in saving essentially determines the external accounts with consequent real effects. It also demonstrates that there are important similarities between the pure theory of international trade and the determination of the external accounts in a general equilibrium framework.

Figure 4.8 depicts an intertemporal offer curve for a small country which opens itself up to international trade in saving. It is based on the information contained in Figure 4.6. The horizontal axis records inward foreign investment or the present period CAD, whereas the vertical axis records the subsequent KAS which will be generated.

![Figure 4.8](image_url)

*Figure 4.8 – Intertemporal Offer Curve (a)*
Here we assume that the substitution effect on present consumption of an interest rate change at least offsets any income effect. Even if the income effect dominated the substitution effect, however, offer curves can still be constructed, provided the extra investment stemming from the lower interest rate exceeds any additional consumption in the first period.

The line $AA^1$ has the same slope in absolute value terms as the autarky budget line in Figure 4.6. Foreign investment continues to rise as the domestic interest rate approaches the world rate. When the domestic interest rate equals the world rate as shown by line $WW^1$, the small country imports $OF$ of foreign saving in period one, which it later repays with interest as $OP$. The triangle $E'OP$ is the same as the intertemporal trade triangle $E'OP$ in Figure 4.6.

In the two region case, the general equilibrium outcome is shown in Figure 4.9. The intersecting ray must lie above the negative $45^\circ$ line, whose slope equals unity, if the interest rate is to be positive.

In parallel with orthodox international trade theory, the offer curves demonstrate that when foreign investment is allowed and capital markets are fully integrated, a common price, the return on capital, must prevail, and this price clears the unified markets. Foreign investment confers welfare gains if economies' real interest rates would be different without trade. Economies would not engage in intertemporal trade, however, irrespective of the extent of capital mobility, if domestic interest rates were identical in autarky.
4.4 Loanable Funds Approach

The neoclassical and intertemporal approaches to foreign investment outlined above suggest that a country's external accounts, as a component of the larger framework of social accounts, are best perceived as a record of international capital flows between countries, rather than as the difference between exports and imports of goods and services.
The intertemporal approach explicitly recognizes that with capital mobility, the external accounts are a nation's saving–investment imbalance, consistent with the accounting flow of funds matrix of Chapter 2. So far, however liquid funds as such have not been afforded any major role in the capital centred approaches. To remedy this omission, we now introduce the loanable funds approach.

The loanable funds theory of interest rate determination advocated by Robertson (1940), amongst others, explicitly recognizes financial flows in the context of saving and investment behaviour. Originally specified for a closed economy, the loanable funds approach as exposited for instance by Tsiang (1989) suggests that on the demand side of the money market, there are $d^1$ funds required to finance firms' investment, $d^2$ funds required to finance firms' replacement capital (i.e. depreciation reserves), $d^3$ funds to be added to inactive balances held as liquid reserves (i.e. hoarding), and $d^4$ funds required to finance households' consumption in excess of disposable income (i.e. dissaving).

On the supply side, there are $s^1$ funds due to the excess of households' disposable income over planned consumption expenditure, $s^2$ depreciation reserves taken out of firms' gross sales of the preceding period, $s^3$ funds used from previously held inactive money balances (i.e. dishoarding) and $s^4$ funds representing the net creation of additional money by banks. In an open economy, again consistent with our earlier flow of funds matrix (Figure 2.4), we can add $s^5$ funds provided by the rest of the world.

The equilibrium condition for the total demand and supply of loanable funds is then

$$d^1 + d^2 + d^3 + d^4 = s^1 + s^2 + s^3 + s^4 + s^5$$
which can be rearranged as,

\[ I - S + \text{Net Hoarding} = KAS \]

\[ (d^1 + d^2) - (s^1 + s^2 - d^4 + s^4) + d^3 - s^3 = s^5 \]

Written this way we can see how the flow record of external imbalance relates to the demand and supply of loanable funds. Domestic and foreign money may be directly supplied by households and by non-residents to domestic firms for investment purposes via the purchase of equities and debt instruments from firms. Or excess funds may be supplied indirectly via financial intermediaries.

The loanable funds perspective also recognizes hoarding activity, or changes in demand for inactive cash balances, the basis for which may be explained by the precautionary and speculative motives, first outlined by Keynes (1936). In this way, the approach provides a link to the monetary underpinnings of the MF model. Though we abstract from hoarding behaviour in what follows, on the assumption that hoarding is relatively insignificant in relation to gross saving and investment flows, it is of interest to note that an increase in hoarding (dishoarding) should increase (decrease) the KAS if the demand for investible funds exceeds the domestic supply.

Since domestic saving equals households' lending and since domestic firms' investment equals borrowing at home and from abroad, the earlier intertemporal framework can now be entirely translated to the present period analysis of the loanable funds approach.
In Figure 4.10 above, firms' demand for funds becomes a decreasing function of the interest rate, whereas the supply of funds lent by households becomes an increasing function of the interest rate. We continue to abstract from the effects of exchange rate expectations and assume all variables are expressed in real terms. The investment possibilities frontier of the intertemporal framework suggests that domestic firms will
borrow funds if the interest rate is less than the return on additional real capital accumulation. The slope of the saving schedule is positive if the substitution effect dominates the income effect.

Schedule AA\(^1\) in the left panel shows economy A's excess demand for saving (its KAS or NFI) for given interest rates with full capital mobility. If the economy is small and the foreign interest rate is \(r^*\), the KAS is OW because the supply of foreign saving is perfectly elastic at any rate below \(r^A\), the autarky interest rate. A fall in the world interest rate would, ceteris paribus, therefore raise the small country's KAS.

In the two region case, schedule BB\(^1\) is introduced to show B's excess supply of saving (CAS) for interest rates above \(r^B\), B's autarky interest rate. This framework may now be used to predict the impact on the external accounts of various exogenous shocks. If, for instance, a decrease in time preference abroad raises foreign saving, the BB\(^1\) schedule would shift down to BB\(^{11}\), lowering the equilibrium interest rate for both countries. A's KAS rises to OD to match B's KAD. Similarly, it can be shown quite easily that a fall in the demand for investible funds in B has the same effect. Hence, with unrestricted foreign investment, A's KAB can also be determined entirely by changes in investment and saving behaviour in B. The shared external imbalance can also change due to shifts in the AA\(^1\) schedule. AA\(^1\) shifts down narrowing the KAS when either A's investment falls or its saving rises. Hence, the extent of foreign investment can depend on either internal and external macroeconomic disturbances.
4.5 Limitations

Like the traditional approaches of the previous chapter, capital theoretic models of the external accounts also have limitations which, for balance, should be canvassed. For instance, the single sector neoclassical approach is entirely static, and hence neglects the importance of expectations. While this deficiency is addressed in the two sector Fisherian approach, agents are there, somewhat unrealistically, assumed to have perfect foresight with no role for uncertainty in the model. Yet some of the key variables in the intertemporal analysis are by nature inherently uncertain – for instance, the expected productivity of capital and hence future income streams.

The location of firms' actual investment possibilities frontier is perhaps better understood as lying within a range, the size of which is determined by the extent of uncertainty. Moreover, the position of the frontier changes whenever there are supply shocks (See Frenkel and Razin (1987)) or changes in technology. Households are also uncertain about the future income on which they base their consumption plans. If future income happens to be less than expected, consumption may therefore prove unsustainable. Alternatively, there will be disequilibrium if income is higher than expected.

The intertemporal approach as outlined above also neglects public sector activity and hence does not explicitly allow for an interpretation of the effects of fiscal policy on the external accounts. However, fiscal policy can be analysed easily enough within the more general loanable funds framework. For instance, we can consider the effects of fiscal changes on either the $S^A$ or $I^A$ schedules of Figure 4.10 where these schedules now represent total domestic private and public saving and total domestic private and public investment.
If there is a fall in public saving following fiscal expansion, the $S_A$ schedule should shift leftwards, widening the external imbalance, assuming full capital mobility. Similarly, a rise in public investment expenditure could shift the $I_A$ schedule rightwards, increasing the KAS. Once again however, we are confronted with the ambiguities of the RE proposition, as discussed in the previous chapter. If RE held in a strict sense, there would be no effect on the external imbalance because, with either increased public consumption or investment there will be an offsetting fall in private consumption at given levels of output. With increased public consumption widening the public account deficit, RE implies no net change in the position of the $S_A$ schedule, whereas with increased public investment, it implies that any rightward shift in the $I_A$ schedule is matched by a rightward shift of the $S_A$ schedule, leaving the external imbalance unchanged at the prevailing interest rate. In practice, provided RE does not hold on a one for one basis, there would therefore be a link between the budget and external deficits. We also see in the following chapter, that capital is not fully mobile in reality, as just assumed in arguing this line of causality between the two deficits. Note that the line of causality is however an alternative to the causal chain implied by the MF model.

Many other underlying assumptions of the capital-theoretic approaches can also be questioned. For instance, prices may not adjust rapidly to clear the goods markets in the background, firms and labour unions may exercise monopoly power and there may be price signalling distortions in both goods and financial markets due to externalities. Moreover, the models abstract from the business cycle under the assumptions of market clearing and price flexibility and virtually ensure unemployment is at the "natural rate" at all times. As output is essentially supply side determined through a macroeconomic production function, the approaches are sharply at odds with the Keynesian inspired MF
approach covered in the previous chapter which stresses factors affecting aggregate demand including the fiscal and monetary policy instruments at the disposal of the authorities. While many of the above assumptions may be technically difficult to relax in capital-theoretic approaches, such relaxation is unlikely to change the broad conclusions about the welfare benefits of capital mobility.

By not affording a role to the central bank, another serious omission of the capital centred models of the external accounts and the open economy is that they fail to explicitly account for the effects of monetary policy and the generation of inflation, although as we saw in the previous chapter, by and large neither do the other more traditional open economy approaches. The approaches interpreted above also somewhat unrealistically put exchange rate considerations aside and hence totally abstracted from the impact of competitiveness on exports and imports.

4.6 Conclusion

In this chapter, international capital movements were examined using general equilibrium models for a small economy facing a fixed world interest rate or, in two country versions, capital mobility was considered in cases where the common interest rate was endogenous. In addition to highlighting the macroeconomic gains achievable through foreign investment, we demonstrated how capital and current account imbalances were intertemporally, and jointly, determined.

However, the foregoing analysis of the welfare effects of foreign investment presumed financial and real capital was perfectly mobile in the sense that cross border real rates of return on capital equalized in the absence of uncertainty. In practice however, foreigner's ignorance of investment opportunities abroad, the phenomena of country risk,
exchange rate risk, tax treatment of earnings on foreign investment and widespread exchange controls restricting capital movements may combine to ensure different national rates of return on capital. The actual extent of capital mobility in Australia is considered in the next chapter after interpreting, from a saving–investment perspective, the stylized facts about the open Australian economy presented in Chapter 2.

Using the precepts of the international capital theory outlined above, the actual extent of the national income and net worth gains attributable to the increase in foreign investment in Australia in the 1980's is quantified in Chapter 6. The principles outlined above are also referred to in the discussion of macroeconomic policy issues in the final chapter.
Appendix 4.1

Foreign Investment and Long Run Income Growth

This appendix examines the macroeconomic impact of full capital mobility on the long run equilibrium growth path of an economy with an expanding capital stock and labour force.¹

Assume a small economy characterised by perfect competition, constant technology and constant returns to scale, and full employment whose output (Y) is determined by an aggregate Cobb–Douglas production function of the form

\[ Y(t) = K(t)^\alpha L(t)^{1-\alpha} \]  

(A.4.1)

where \( K \) is the capital stock employed domestically, \( L \) is the amount of labour and \( \alpha \) is the elasticity of output with respect to capital inputs. Under the above assumptions, \( \alpha \) is also capital's share of total output. Therefore the domestic rate of return on capital is \( \alpha Y(t)/K(t) \).

Further assuming that domestic saving is a constant fraction, \( \gamma \), of national income and that labour effort is growing at a constant rate, \( n \), then without capital mobility the output–capital ratio along the equilibrium growth path is \( \frac{n}{\gamma} \), so that the rate of profit equals \( \frac{\alpha n}{\gamma} \).

Assume now that the economy moves from zero capital mobility to full capital mobility at period 0. If the foreign rate of return on capital is \( r^* \), then the economy will immediately import capital if \( r^* < \frac{\alpha n}{\gamma} \).

If \( K_f(t) \) is the total domestic capital stock, \( K^* \) of which is foreign owned, then

\[ K_f(t) = K(t) + K^*(t). \]  

(A.4.2)

¹ Amano (1965) adopts a similar approach.
Following a move to full capital mobility, the domestic return on capital equates with the foreign return on capital. Therefore, it can be shown that

\[ Y(t) = \frac{r^*}{\alpha} K_f(t) \]  

(A.4.3)

Since \( L(t) = L(0)e^{nt} \), it is possible to derive from (A.4.1) and (A.4.3)

\[ K_f(t) = K(0)e^{nt}; \quad K_f(0) = L(0)\left(\frac{\alpha}{r^*}\right)^{\frac{1}{1-\alpha}} \]  

(A.4.4)

As we know, national income \( (Y_n) \) is the difference between output and interest paid abroad

\[ Y_n(t) = Y(t) - r^*K_f(t) \]  

(A.4.5)

Lastly, we can express the saving–investment imbalance as

\[ \gamma Y(t) + \frac{dK^*(t)}{dt} = \frac{dK_f(t)}{dt} \]  

(A.4.6)

Using (A.4.3) and (A.4.4) and substituting (A.4.5) into (A.4.6) yields

\[ \frac{dK^*(t)}{dt} - r^*\gamma K^*(t) = \frac{dK_f(t)}{dt} - \gamma Y(t) \]

\[ = \left( \frac{dK_f(t)}{dt} - \gamma \frac{Y(t)}{K_f(t)} \right) K_f(0)e^{nt} \]

\[ = \left( n - \frac{r^*\gamma}{\alpha} \right) K_f(0)e^{nt} \]  

(A.4.7)
Equation (A.4.7) is a non-homogeneous first order linear differential equation in $K'(t)$ whose general solution is given by

$$K'(t) = C_1 e^{nt} + C_2 e^{-rt}$$  \hspace{1cm} (A.4.8)

where

$$C_1 = \frac{n - r \gamma}{\alpha} K(0) \quad \text{and} \quad C_2 = K(0) - C_1$$

$C_1 > 0$ since $n > r \gamma / \alpha$ and $\alpha < 1$ by assumption. $C_2$ can be re-expressed as

$$C_2 = \frac{(1 - \alpha) r \gamma}{\alpha(n - r \gamma)} K(0) - \frac{n - r \gamma}{\alpha(n - r \gamma)} K(0) - K(0)$$

$$= \frac{\gamma}{n - r \gamma} \left( \frac{1 - \alpha}{\alpha} r \gamma K(0) - \left( \frac{n - r \gamma}{\alpha} \right) K(0) \right)$$  \hspace{1cm} (A.4.9)

If $Y_0(0)$ is the value of national income which would have been produced at period 0 without foreign investment, then

$$Y_0(0) = \frac{1}{\alpha} \left( \alpha n \right) K(0) < Y(0) = \frac{r^*}{\alpha} (K(0) + K^*(0)) - r^* K^*(0)$$

or

$$\frac{1 - \alpha}{\alpha} r^* K^*(0) - \left( \frac{n}{\gamma} - \frac{r^*}{\alpha} \right) K(0) > 0$$  \hspace{1cm} (A.4.10)

From (A.4.9) and (A.4.10), it follows that $C_2 > 0$. 
The time path of national income may be derived from (A.4.3), (A.4.4), (A.4.5) and (A.4.8)

\[ Y_s(t) = \frac{(1 - \alpha)n r^*}{\alpha(n - r^*)} \frac{K_s(0)e^{nt}}{Y_s(t)} - C_f e^{r^*t} \]  

(A.4.11)

Therefore, we can express the rate of growth of national income, \( g(t) \), as

\[ g(t) = \frac{dY_s(t)}{Y_s(t)} = n + \frac{C_f e^{r^*t}}{Y_s(t)} (n - r^*) \]  

(A.4.12)

As \( C_2 > 0 \), it follows from (A.4.12) that \( g(t) > n \) for \( 0 \leq t < \infty \). However, \( g(t) \) declines through time as \( C_f e^{r^*t}/Y_s(t) \) diminishes. Finally, \( g(t) \to n \) as \( t \to \infty \).

Therefore, we can conclude that with a move from autarky to full capital mobility, the rate of growth of national income is transitionally higher than the equilibrium growth rate (\( n \)) in the very long run.
CHAPTER 5

SAVING, INVESTMENT AND CAPITAL MOBILITY: 1970's vs 1980's

5.1 Introduction

This chapter returns to the Australian external account experience and aims to explain the key determinants of the increase in Australia's CAD and NFI position during the 1980's compared to the 1970's. To do this, it examines the reasons for, and implications of, the stylized facts presented earlier in Chapter 2. Australia recorded one of the largest KAS's in the OECD over the 1980's with net capital inflow averaging 4.2 percent of GDP per year compared with 1.7 percent in the 1970's. Though the real external imbalance was less (at 2.3 percent) during the 1980's, it was argued in discussion of the first stylized fact of Chapter 2 that real capital transfer would have been significantly higher over the most recent decade.

Moreover, the second stylized fact of Chapter 2 drew attention to the sharp rise in net external liabilities, particularly foreign indebtedness from the early 1980's. The increase in NFI over the 1980's was also accompanied by a marked increase in domestic private capital accumulation, as stylized fact four asserted, while private saving behaviour remained fairly stable (fact three). Facts five and six described public saving and investment behaviour.

The chapter evolves by firstly evaluating possible economic determinants of domestic saving and investment with reference to a simple absorption inspired theoretical framework which is consistent with the models of the previous chapter. This explicitly allows us to consider shifts in saving and investment and their implications for NFI in the
context of changing national output. Influences canvassed in what follows include shifting demographics, both domestically and internationally, increased profitability and rising asset prices, fiscal activity, the terms of trade and monetary policy.

Notwithstanding changes in some of the likely determinants of private saving, the stability of this aggregate suggests that increased private investment spending, not lower saving, was the major cause of the rise in private NFI. Yet, there is also evidence that private and public saving are imperfect substitutes, contrary to the RE proposition, such that variations in the fiscal stance are likely to have affected external account outcomes by altering the pattern of public saving and investment.

Attention then turns to the impact of financial deregulation from the early 1980's as a necessary condition for the rise in NFI, with the primary emphasis on the effects of increased capital market integration arising from the liberalisation of international financial transactions. This allows us to model the sharp increase in foreign indebtedness during the 1980's as a stock adjustment process and to consider the extent to which international capital mobility, a unifying theme of the theoretical discussion in Chapters 3 and 4, increased in reality.

5.2 Domestic Saving, Investment and NFI

Chapter 4 stressed that the external account imbalance is best understood as the difference between domestic saving and investment. This suggests it may be illuminating to examine determinants of saving and investment behaviour separately over the 1970s and 1980's in order to explain external account outcomes over this period. In other words, what domestic and external shocks possibly influenced domestic saving and investment,
causing short term deviations from an apparent trend increase in NFI? And what other factors of themselves affected NFI in the 1980's?

To assist understanding of how medium to longer term influences on domestic saving and investment behaviour may affect NFI, consider Figure 5.1 below, frequently referred to in the subsequent discussion of this section.

Figure 5.1 – Saving, Investment and NFI

Domestic saving is depicted in this diagram as an increasing function of output and hence national disposable income, whereas investment opportunities are presumed autonomous. All variables are expressed in real terms.

Contrary to the closed economy case where the level of national saving fully constrains investment spending, this framework again shows that in a financially open economy, domestic investment, both private and public, may be independent of domestic saving. The difference between ex ante investment and saving determines the CAD, the KAS and NFI at any level of output.
Unlike the loanable funds approach of the last chapter, it explicitly allows for changing income levels and contrary to the MF model of Chapter 3, it is consistent with the absorption approach, since changes in domestic expenditure at a given output level immediately affect the external imbalance. Although saving is shown as an increasing function of income, the S schedule need not necessarily depict a simple Keynesian saving function, as usually assumed in the MF approach for example. If for example, the horizontal axis was relabelled permanent income, the S schedule would still be upward sloping, but would pass through the origin. However, since anticipated changes in permanent income could potentially affect both saving and investment, the separation of the saving and investment functions would not be as clear cut.

Without NFI, domestic capital accumulation would be only $DY_1$. With NFI however, capital accumulation is that much greater and as real capital, net of depreciation, is an input to the production process, this extra capital should further increase the future level of output, a result consistent with the intertemporal approach of Chapter 4. The arrows on the horizontal axis of Figure 5.1 signify that the additional productive capital, which NFI permits, is being accumulated in an economy growing through time. Hence, this simple model abstracts from the business cycle and is best suited to demonstrating the external account consequences of medium to longer run changes in saving and investment.

5.2.1 Saving Behaviour

Providing an historical perspective, McLean (1991) argues that Australia's gross saving rate over recent decades is markedly higher than it was in the second half of the last century, due to a secular trend increase. Treasury (1992) suggests there was a decline in nominal private saving as a proportion of national income between the 1970's and
1980's. Yet, according to our third stylized fact of Chapter 2, Australia's private saving behaviour, adjusted for inflation, has been quite stable over more recent decades, fluctuating in a fairly narrow band around 15 percent of GDP since the early 1970's. In decade average terms, officially measured gross private saving to GDP in nominal terms was at 18.5 percent, in the 1980's unchanged from the decade average of the 1970's, while inflation adjusted private saving rose slightly in decade average terms from 14.7 percent in the 1970's to 15.6 percent in the 1980's.

In contrast, Whitelaw and Howe (1992) seem to suggest that private saving was reduced in the 1980s. However, Whitelaw and Howe's claim about the decline in private saving is not as rigorously quantified as the treatment of private saving by Edey and Britten-Jones (1990) discussed earlier and at length in Chapter 2. Because Whitelaw and Howe's discussion tends at times to blur the distinction between private and total saving, it is possible that readers might perceive a sharper difference than actually exists between their conclusions about overall saving behaviour and the earlier discussion of Chapter 2 of this thesis.

Whitelaw and Howe only present one chart of nominal private saving (see Whitelaw and Howe (1992: p 13)) which in fact is entirely consistent with Chart 2.12 of Chapter 2 of this thesis. However, unlike Edey and Britten Jones' analysis of saving behaviour, Whitelaw and Howe fail to present any separate inflation-adjusted measure of private saving in isolation. Such a measure, as we noted in Chapter 2, suggests private saving was even more stable than indicated by the nominal measure of private saving.

Nonetheless, Whitelaw and Howe did present an inflation-adjusted measure of total saving which revealed some fall in total saving in the 1980s on account of the fall in public saving over this period. This fall in public saving has also been canvassed in Chapter 2.
Whitelaw and Howe argue that a range of factors influenced private saving in the 1980s. First, they argue that financial liberalisation allowed households to bring forward consumption more easily in anticipation of future income. Second, they proposed that the asset price inflation of the 1980s, to the extent that it raised wealth holdings, should have stimulated further private consumption. Third, they suggest that higher unemployment levels and the associated dependence on unfunded social security payments have tended to depress Australia's private saving levels below the OECD average.

Each of these factors will be considered more thoroughly in the remaining sections of this chapter when canvassing the wide range of influences on saving behaviour. Indeed, at times, the conclusions reached in the following discussion of these influences are at odds with those argued by Whitelaw and Howe.

The largest short run deviation from the relatively trendless pattern of private saving as a proportion of GDP since 1980 occurred in 1982–83, coinciding with a severe recession of that time. More generally, the short term behaviour of private saving is seemingly well explained by consumption smoothing, whereby saving moves inversely with temporary fluctuations in national income.

The household saving component of total saving declined significantly however in the 1980's, especially in countries where there had been domestic financial liberalisation, such as North America, the United Kingdom, Australia, New Zealand and the Nordic countries. Indeed, in Finland, Norway and Sweden, net household saving ratios became negative (See Lehmusarri (1990)). However, these falls in household saving tended to be offset by rises in business saving, leaving gross private saving, the aggregate we are most interested in from an international macroeconomic perspective, largely unchanged. Dean et al. (1989) provide recent empirical evidence of this phenomenon ("seeing through the corporate veil") for OECD countries. Furthermore, the empirical evidence suggests that neither movements in interest rates nor the strong rise
in private sector wealth in OECD countries had any effect on short run saving behaviour. (See Edey and Britten–Jones (1990) and Bosworth (1991).)

In the economic policy debate about Australia's external account imbalance which is addressed more fully in the final chapter, it has been suggested that the external position is a manifestation of domestic saving being "too low". (See Office of EPAC (1988a) and Moore (1990) for instance). Hence, by implication, policy measures should aim at shifting the saving schedule of Figure 5.1 upward to narrow the perceived problem of the CAD being "too high". In fact however, though not adjusted for the distortionary effects of domestic inflation, the OECD data presented in Chart 5.1 below shows that, relatively speaking, Australia saved in gross terms during the 1980's at much the same rate as the average for all member countries and slightly more than the United States and the United Kingdom.

Among OECD members, it is Japan's saving to GDP ratio which stands out as exceptional, because it is so high, being at least 50 percent greater than comparable ratios for Australia, the United States, the United Kingdom and Canada. A rising portion of the excess of Japan's gross saving over its own domestic investment financed additional investment in Australia in the 1980's, as suggested by data in Table 5.1 which shows the main sources of capital inflow.

Demographic factors may influence saving patterns through time, both across countries and within countries, by altering the age composition of the population, insofar as consumption behaviour changes between different age groups. According to ABS data (see ABS (1989)), Australia's population did age slightly between 1970 and 1989, with the percentage of the total population aged 65 and over, rising from 8.4 percent to 11.0 percent. There was also a fall in the proportion of young dependents (persons under 15) and a rise in proportion of the population of working age (15–64 years). If retirees have a higher consumption to income ratio, then consistent with
the "life-cycle" hypothesis (Ando and Modigliani (1963), this should have resulted in some fall in private saving over the 1980's, causing a downward shift of the S schedule of Figure 5.1. Yet this was not evident since cross sectional data for Australia actually indicates very little variation in saving across age groups (Edey and Britten-Jones (1990)).

Another demographic factor which could conceivably affect both domestic saving and investment behaviour is immigration, to the extent that it increases population growth, alters consumption patterns and creates a demand for additional capital to accommodate and employ the extra population. Since 1970, immigration growth rates have been more variable than the natural rate of population increase, and peaked in 1987 and 1988. This may have had some short term effects on aggregate investment though perhaps not saving.

Empirically however, the 1980's were not characterised by any sharp increase in overall population growth compared to the 1970's. In fact, the average annual rate of population growth fell very slightly from 1.6 percent in the 1970's to 1.5 percent in the 1980's. Though this steady growth would have sustained demand for investment, of itself, it can not explain the trend increase in the CAD and NFI in the 1980's.

Significant differences in age profiles, combined with the nature of the social security system and the way it provides for retirement, are likely however to account for at least part of the difference between saving rates across countries. In this regard, Dean et al (1989) proposed that saving rates differed internationally because age profiles and social security systems differed. Australia has a generous publicly funded pension scheme, in contrast to Japan for example. In other words, though demographic factors have not apparently affected saving much within Australia as between the 1970's and 1980's, such influences may well explain some of the differences between Australia and its sources of foreign capital. Heller (1988) predicts for instance that the proportion of
SAVINGS/GDP vs. INVESTMENT/GDP for selected OECD countries in the 1970s.
SAVINGS/GDP

CHART 5.1(b)  SAVING AND INVESTMENT IN THE 1980's - SELECT OECD COUNTRIES
### Table 3.1: Sources of Capital Inflow

| Year   | European Economic Community | | | United States of America | | | International capital markets |
|--------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|        | United Kingdom | Other | Japan | Other | Other | Other |
|        | $ million | percent to total | $ million | percent to total | $ million | percent to total | $ million | percent to total | $ million | percent to total |
| 1970-71 | 539 | 34.4 | n.a. | n.a. | n.a. | n.a. | 473 | 30.1 | 537 | 34.2 | n.a. | n.a. |
| 1971-72 | 382 | 25.6 | n.a. | n.a. | n.a. | n.a. | 562 | 37.7 | 502 | 33.7 | n.a. | n.a. |
| 1972-73 | 121 | 20.2 | 51 | 8.5 | 51 | 8.5 | 89 | 14.8 | 182 | 30.2 | n.a. | n.a. |
| 1973-74 | 104 | 14.7 | 83 | 11.7 | 77 | 10.9 | 189 | 26.7 | 36 | 5.1 | n.a. | n.a. |
| 1974-75 | 146 | 12.9 | 176 | 15.5 | 67 | 5.9 | 375 | 33.1 | 240 | 21.2 | n.a. | n.a. |
| 1975-76 | 328 | 39.6 | 19 | 2.3 | 98 | 11.8 | 378 | 45.6 | 38 | 4.6 | n.a. | n.a. |
| 1976-77 | 384 | 22.2 | 264 | 15.3 | 138 | 8.0 | 613 | 35.4 | 138 | 8.0 | n.a. | n.a. |
| 1977-78 | 404 | 28.4 | 77 | 5.4 | 197 | 13.9 | 605 | 42.5 | 36 | 2.5 | n.a. | n.a. |
| 1978-79 | 837 | 39.1 | 89 | 4.2 | 279 | 13.0 | 720 | 33.6 | 51 | 2.4 | n.a. | n.a. |
| 1979-80 | 1022 | 32.4 | 402 | 12.8 | 422 | 13.4 | 724 | 23.0 | 511 | 16.2 | n.a. | n.a. |
| 1980-81 | 1928 | 31.1 | 503 | 8.1 | 845 | 13.6 | 1329 | 21.5 | 1535 | 24.8 | n.a. | n.a. |
| 1981-82 | 2674 | 26.9 | 585 | 5.9 | 1272 | 12.8 | 1852 | 18.6 | 3466 | 34.8 | n.a. | n.a. |
| 1982-83 | 2237 | 23.8 | 875 | 9.3 | 2709 | 28.8 | 248 | 2.6 | 3159 | 33.6 | 102 | 1.1 |
| 1983-84 | 2312 | 26.1 | 755 | 8.5 | 905 | 10.2 | 1109 | 12.5 | 3794 | 42.7 | 574 | 6.5 |
| 1984-85 | 1987 | 18.5 | 726 | 6.8 | 1566 | 14.6 | 3227 | 30.1 | 3208 | 29.9 | 1869 | 17.4 |
| 1985-86 | 875 | 6.5 | 1684 | 12.5 | 1775 | 13.1 | 3077 | 22.8 | 6111 | 45.2 | 5711 | 42.2 |
| 1986-87 | 3237 | 20.3 | 1055 | 6.6 | 603 | 3.8 | 3148 | 19.7 | 7902 | 49.6 | 4271 | 26.8 |
| 1987-88 | 5772 | 27.4 | 1031 | 4.9 | 2659 | 12.6 | 958 | 4.6 | 10621 | 50.5 | 4666 | 22.2 |
| 1988-89 | 2195 | 8.6 | 1984 | 7.7 | 3803 | 14.8 | 5442 | 21.2 | 12230 | 47.7 | 6676 | 26.0 |
| 1989-90 | -570 | -2.6 | 781 | 3.6 | 6694 | 31.1 | 1745 | 8.1 | 3623 | 16.8 | 9253 | 43.0 |

Source: ABS, Cat. 5305.0.
elderly in Japan's population will grow quickly in the 1990's, reducing private saving from the relative highs of the 1980's, given the nature of the Japanese retirement provision system. In other words, the high rate of Japanese saving in the 1980's seems to have been partly determined by the forward looking consumption behaviour of a significant component of its population. Similarly, Hagenmann and Nicoletti (1989) suggest that the aging of Germany's population could soon lower Germany's relatively high saving rate.

Both Japan and Germany were major sources of capital inflow to Australia in the 1980's and to the extent that these demographic factors raised saving in those countries over the period, they were exogenous determinants of Australia's external imbalance. That is, increased capital inflow meant more domestic investment opportunities were exploited by domestic firms borrowing part of this "excess" foreign saving or by foreign controlled firms investing directly, such that NFI and the investment schedule of Figure 5.1 rose simultaneously.

It has also been argued that microeconomic distortions, due for instance to the nature of the taxation system, may make domestic saving less than optimal. The same may be said of tax systems abroad which make saving more than optimal. For our purposes, however, what is at issue is whether specific changes to Australia's tax system affected domestic saving as between the 1970's and 1980's. Though there were taxation initiatives affecting capital gains and superannuation in the mid 1980's, their net effect on private saving is unclear a priori and in any case, to re-emphasize, private saving remained stable. Kingston (1991) has also highlighted the business tax advantages afforded to borrowing as opposed to equity raising under conditions of high inflation, as a reason for the growth in external debt. However, since inflation was actually lower in the 1980's than 1970's, it is not clear why this factor of itself would have increased external
liabilities in the later decade. We will address the escalation in external debt shortly in the context of a stock adjustment process in the wake of financial deregulation.

### 5.2.2 Investment Behaviour

Whereas empirically, private saving behaviour in Australia, both inflation adjusted and unadjusted, was relatively stable over the 1970's and 1980's, nominal and real private investment expenditure as a proportion of GDP was on average higher in the 1980's. The rise in private investment is more evident from Chart 2.17 which reveals a near doubling of the average rate of growth of real domestic investment in the 1980's over the 1970's. Since private saving was fairly stable and private investment increased, the rise in private NFI therefore essentially financed additional real capital accumulation.

The 1970's were characterized by historically low levels of business investment, particularly during the recessionary trough of the mid-1970's. On the other hand, two investment booms distinguished the 1980's – a short lived mineral resources boom at the start of the decade and strong overall investment from the mid to late 1980's, with non-dwelling construction as the most buoyant component.

A fundamental determinant of private domestic investment in the 1980's was a rise in corporate profitability, attributable to real wage falls which occurred from 1983/84 onwards. (See Chapman (1990) for further discussion.) On the contrary real wages increased in the major industrial countries (Treasury (1990)). This meant that relative factor shares changed considerably more in Australia over the 1980's than in other OECD countries, particularly the United States and United Kingdom. As evident from Table 5.2, the size of the ratio of Australia's gross operating surplus (GOS) to GDP was similar to comparable ratios for Japan and Germany by the mid-1980's and was restored in Australia
to levels experienced in the early 1970's. Whether wage restraint, of itself, affected the external accounts is somewhat ambiguous however, since as Corden (1986) notes, a reduction in the wages share of national income is also likely to increase national output, as well as the domestic investment component of total expenditure.

Table 5.2 Gross Operating Surplus to GDP – Select OECD Countries

<table>
<thead>
<tr>
<th>Australia</th>
<th>Japan</th>
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<tr>
<td>1970</td>
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<td>0.18</td>
</tr>
</tbody>
</table>


A direct indicator of overall corporate profitability before-tax is the ratio of gross operating surplus to the capital stock i.e. \( \frac{GOS}{K} \). This approximate measure of the average rate of return on real capital rose in the 1980's for both the private and public
sectors. (See Chart 5.2.) The rise in the return on private capital was most dramatic, averaging over 14 percent in the second half of the 1980's, compared with around 11 percent in the 1970's.

By raising the rate of return on capital, the higher profit share in the 1980's should have raised the desired level of capital, giving rise to an adjustment period characterised by buoyant investment and output growth. As an ex post average measure of the rate of return on capital, \( \frac{GOS}{K} \) is, however, an imperfect proxy for the relative ex ante marginal rate concept used in the open economy capital theory of the previous chapter. Desirably, other macroeconomic rates of return on capital, such as relative earnings-price ratios for equities across country borders, should also be considered, but data limitations prevent this.

Sustained increases in profitability in the 1980's also undoubtedly improved the ratio of the market valuation of companies to the replacement cost of capital. The average annual nominal rise in equity prices in the 1980's was over 13 percent, well in excess of the 2 percent average of the 1970's. According to the q theory of investment outlined in Chapter 4, a rise in q should of itself stimulate additional real investment and therefore induce real capital transfer from abroad. Though McKibbin and Siegloff (1987) found that only a relatively small share of business investment expenditure could be explained by movements in the q ratio between the 1960's and the first half of the 1980's, it is evident from Chart 5.3 that there was a reasonably strong correspondence between q (as estimated by Treasury (1990)) and growth in the private capital stock over the 1970's and 1980's taken as a whole.
CHART 5.2  RATE OF RETURN AND CAPITAL STOCK GROWTH
Chart 5.3  Tobin's q Ratio and Capital Stock Growth
The 1980's witnessed a strong rise in nominal property values as well as nominal equity prices, referred to as "asset price inflation" (Urbanski 1991). The stock implications of this asset price inflation are discussed at greater length in Chapter 6 where national balance sheets for Australia are constructed.

In sum then, it appears that unexploited investment opportunities, initially reflected in rising q values for those companies listed on the Australian stock exchange, were greater in the 1980's relative to the 1970's. Again, in terms of our Figure 5.1, this suggests there were forces such as wage restraint shifting the investment schedule upward and that the additional investment was willingly financed by foreign saving, as manifested in higher NFI.

Foreign saving may be borrowed by domestic or foreign controlled firms to finance additional investment in Australia which is essentially the portfolio versus direct foreign investment distinction defined and quantified earlier in Chapter 2. Though foreign direct investment entails loss of control of corporate assets, it usually generates important benefits including technology transfer, international management expertise and product innovation. (See Agarwal (1980). With direct investment, the investment and funding decisions are often taken together by multinational corporations. Therefore, increased imports of capital goods, recorded on the trade account may be simultaneously matched by financial capital inflow to directly finance their purchase, though of course this will not necessarily occur. If it does however, the extra supply of foreign exchange can therefore be used directly to purchase additional imported capital goods; hence, there is unlikely to be any effect on the exchange rate attributable to a change in the net flow demand for foreign currency. As the acquisition of additional real capital is matched by additional external liabilities, national net worth, a concept to be discussed shortly, also remains
unchanged under these circumstances. Nonetheless, as we will see, net worth may change as indirect or portfolio foreign investment increases.

The rise in gross foreign investment in Australia was, as highlighted earlier in Chapter 2, largely attributable to borrowing activity, with the share of direct foreign investment remaining quite stable throughout the 1980's. Though still high, such direct investment data may, nonetheless, understate the full extent of real domestic investment activity initiated by foreign interests. Evidence of this is provided by the Foreign Investment Review Board (FIRB, Annual Report 1990–91), an independent advisory board to the Federal Treasurer, established in 1976. The FIRB discloses expected direct investment expenditure proposals submitted by foreign interests for establishing new businesses or acquiring existing resident firms. Yet FIRB direct investment statistics do not reconcile with corresponding ABS foreign investment statistics because direct foreign investment proposals are often funded through domestic borrowings, earnings retained in Australia, or through international capital markets which are outside the domain of particular economies whose residents exercise control over domestic enterprises. Interestingly, direct foreign investment approved by the FIRB exceeded $23 b in 1989–90 and $20 b in 1990–91, not including the value of proposals which fell below the FIRB's surveillance threshold. Though these values easily exceed ABS direct foreign investment flows for these years suggesting that an even greater share of real investment undertaken in Australia was exogenously determined, it should be borne in mind that the FIRB proposals data relate to officially approved projects which are not necessarily completed.

The FIRB data is also useful in a supplementary sense, indicating for instance that by the end of the 1980's, Japan was the most significant direct investor source country, followed by the United States and the United Kingdom. Domestic industries which
attracted most proposals were real estate development, particularly in Queensland, mining, manufacturing, services and tourism.

Offsetting this direct foreign investment in Australia was a step increase in direct Australian investment abroad, in the second half of the 1980's, peaking at around $9 b in 1987–88. This was the result of some large domestic enterprises, for instance in the brewing and transport industries, expanding their operations abroad. The abolition of official restrictions governing foreign investment inflows and outflows during the 1980's, to be discussed at greater length shortly, undoubtedly influenced the magnitude of foreign investment inflows and outflows.

5.2.3 Fiscal Activity

Although we have argued that there was a marked increase in NFI financing additional capital formation in the 1980's, McLean (1991), again providing an historical perspective, shows that the extent to which foreign saving financed gross capital formation in the 1980's is easily overshadowed by much earlier episodes, particularly during the 1890's and 1920's. At those times however, the public sector accounted for a relatively larger share of overseas borrowings. What broader role then has the public sector played in the rise in Australia's NFI in the 1980's?

There was some correspondence between annual changes in the inflation–adjusted budget and external account imbalances in the 1980's, as suggested by the "twin deficits" hypothesis, but this broke down completely in the late 1980's when rising budget surpluses coincided with increasing, not decreasing, CAD's. The CAD's of Canada and the United Kingdom also widened during similar fiscal consolidation. In Australia, this
phenomenon could also have been partly due to the foreign financed private investment boom of the late 1980's raising incomes and hence real tax revenue.

As argued in Chapter 3 and Chapter 4, the twin deficits hypothesis, irrespective of the nature of the theoretical linkages, ultimately depends on unchanged private saving behaviour in the face of a rising public debt, contrary to the RE proposition. Given the stability of inflation-adjusted private saving behaviour in the 1980's, in the face of lower public saving earlier in the decade and higher public saving later in the decade, it appears that private and public saving were not fully substitutable. Hence the RE proposition failed to hold on a one for one basis.

A considerable Australian literature has developed on the econometric relationship between fiscal imbalances and the external accounts. (See for instance, Monadjemi (1989) and Karunaratne (1991)). What apparently prompted Australian interest in this linkage was the near co-incident rise in the public sector borrowing requirement (PSBR) and the CAD in the early 1980's.

Several macroeconometric models have also been used to estimate the impact of fiscal expansion on the external accounts as surveyed by Nguyen (1989) and Pagan (1990). (See also Parsell, Powell and Wilcoxen (1991). Although these models yield a range of quantitative results, they imply that, ceteris paribus, a rise in the budget deficit increases the CAD. For instance, using the MSG2 model, McKibbin and Eliot (1989) showed that the CAD would rise by 0.5 percent of GDP in the first year and by 0.75 percent of GDP after five years, following a permanent one percent increase in government spending. Similarly, using the Treasury's NIF88 model, Kouparitsas, Pearce and Simes (1989) found that the extent of the initial rise in the CAD was about half that the increase in government spending. Murphy (1989), on the other hand showed that
according to his model, which remains the most thoroughly specified macroeconometric model for Australia, a tax cut which raised public debt also eventually raised foreign debt to the same extent. Conceptually, the Murphy model extends the MF approach along the lines of Dornbusch (1976), but also includes a reasonably well specified supply side (for further details, see Murphy (1986)). Freebairn (1989) obtained much the same result as Murphy from the industry-oriented ORANI model. In contrast, Hughes (1989) showed that according to the IMP model, there was no significant empirical link between fiscal expansion and the CAD.

Overall, the estimated responsiveness of the CAD to a change in the fiscal deficit varied between zero and one. To a large extent, the outcomes mirrored the assumptions and behavioural relationships underpinning the various models. For instance, in Murphy's model and the MSG2 model, government bonds are explicitly included as a component of private sector wealth and in this way directly influence domestic consumption. Consequently, it is not surprising that an increase in public debt raises the saving–investment imbalance, thus negating the open economy version of the RE proposition. Moreover, changes in taxes or public spending may, through incentive effects, alter private sector saving and investment behaviour in other ways. Hence as suggested by Genberg (1988), RE may be necessary but not sufficient for a one to one relationship between the consolidated public account and the CAB.

In terms of Figure 5.1, the failure of the RE proposition to hold implies that changes in public saving shifted the total S schedule about somewhat during the 1980's; downwards, for example, during the fiscal expansion and associated fall in public saving of the early to mid 1980's and upward during the fiscal contraction and rise in public saving of the late 1980's. To the extent that domestic fiscal policy does affect total
saving, it must also be acknowledged that fiscal policy abroad affects the availability of foreign capital. In this regard, it is noteworthy that there was strong fiscal consolidation in Japan and Germany throughout the 1980's, which should have augmented the total supply of capital available for domestic and foreign use in those countries. The reverse was true however for the United States in light of its relatively loose fiscal stance.

Fiscal restraint in Australia in the late 1980's lowered public investment as well as public consumption. Nonetheless, the reduced public investment was more than offset by rising private investment as discussed earlier. Hence, the total investment schedule of Figure 5.1 still shifted upward in net terms in the late 1980's by more than the increase in total saving, resulting in a wider CAD and increased NFI.

This outcome however ignores conceptual issues about whether a large part of public expenditure is more appropriately classified as investment rather than consumption. For instance, to the extent that increased health and education spending, now defined as public consumption, improves the productivity of the human capital stock, it could be considered as contributing to increased public investment, rather than lower public saving. Though the pattern of Australia's public saving and investment in the 1970's and 1980's would look quite different if reclassified this way, ceteris paribus, the size of recorded NFI would nonetheless remain the same. Australia's total saving would have been less affected by the swings in recorded public saving shifting the total saving schedule of Figure 5.1, but instead there would have been greater offsetting variation in public investment shifting the total investment schedule in the opposite direction.
5.2.4 The Terms of Trade

Another possible influence on the external accounts is the nation's terms of trade, defined as the ratio of the prices received for exports to prices paid for imports. Like most economies, Australia is small in the sense that it exerts negligible influence over the prices it receives for its exports or pays for its imports, the key assumption underlying the dependent economy or Swan–Salter model of an open economy evaluated in Chapter 3.

The applicability of the original version of this model for examining external account determination was questioned in Chapter 3 on the grounds that it failed to acknowledge capital flows and hence did not allow for saving–investment imbalances. However, since the model recognizes the distinction between output and expenditure decisions, it may be possible to adapt the approach to suit conditions of high capital mobility.

A further shortcoming of the dependent economy model, yet common to all traditional approaches to the external accounts, is that it presumes a given terms of trade. In the international literature, the impact of terms of trade shocks on the current account has been modelled by Obstfeld (1980, 1982), Dornbusch (1983), Svensson and Razin (1983), Persson and Svensson (1985), Frenkel and Razin (1987), Ostry (1988) and Pitchford (1990).

The structure of Australia's industry is such that its exportables are predominantly commodities and its importables are mainly high value added manufactures, a production pattern and goods market specification which makes the economy vulnerable to sometimes severe terms of trade shocks. Australia's susceptibility to terms of trade shocks is consistent with the fact that it has the second most variable terms of trade in the OECD region. See Table 5.3.
Table 5.3  Terms of Trade Variation – OECD Members 1960–1989

<table>
<thead>
<tr>
<th></th>
<th>Standard Deviation</th>
</tr>
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<tbody>
<tr>
<td>Japan</td>
<td>31.06</td>
</tr>
<tr>
<td>Australia</td>
<td>23.24</td>
</tr>
<tr>
<td>Spain</td>
<td>23.09</td>
</tr>
<tr>
<td>New Zealand</td>
<td>17.24</td>
</tr>
<tr>
<td>United States</td>
<td>16.82</td>
</tr>
<tr>
<td>Italy</td>
<td>15.67</td>
</tr>
<tr>
<td>Norway</td>
<td>15.13</td>
</tr>
<tr>
<td>Iceland</td>
<td>13.02</td>
</tr>
<tr>
<td>Greece</td>
<td>11.44</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>8.30</td>
</tr>
<tr>
<td>Germany</td>
<td>8.03</td>
</tr>
<tr>
<td>Denmark</td>
<td>7.95</td>
</tr>
<tr>
<td>Ireland</td>
<td>7.65</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6.18</td>
</tr>
<tr>
<td>France</td>
<td>5.94</td>
</tr>
<tr>
<td>Belgium</td>
<td>5.88</td>
</tr>
<tr>
<td>Netherlands</td>
<td>5.59</td>
</tr>
<tr>
<td>Austria</td>
<td>5.28</td>
</tr>
<tr>
<td>Sweden</td>
<td>5.18</td>
</tr>
<tr>
<td>Finland</td>
<td>5.01</td>
</tr>
<tr>
<td>Canada</td>
<td>4.75</td>
</tr>
</tbody>
</table>

Notes: (a) Annual terms of trade computed as the ratio of export unit values to import unit values;


During the 1970s, there were two significant terms of trade shocks – a sharp rise at the start of the period, followed by a marked decline through until the end of that decade. In the following decade, the most severe fluctuations were a slump in the mid 1980's, followed by an even sharper rebound in the late 1980s, reflecting strong movements in
world commodity prices. Nonetheless, over the past three decades, there does not appear to have been any secular change in Australia's terms of trade.

The terms of trade may impact directly and most immediately on the external accounts by affecting recorded export and import prices in domestic currency and hence the value of the trade account, unless exchange rate movements immediately offset world price movements. At a more fundamental level however, it is better to interpret the significance of terms of trade shocks through their impact on national income and saving. If for instance terms of trade induced fluctuations in income, due to changes in the purchasing power of exports (see Treasury (1986)), are perceived as temporary, household saving should rise and fall in line with the terms of trade in accordance with Friedman's (1957) permanent income theory of consumption.

McTaggart and Rogers (1989) suggest an empirical link exists between the household component of total saving and the terms of trade. As the saving–investment imbalance, the CAD should therefore widen during terms of trade slumps and narrow through upswings to the extent that, for given investment opportunities, consumption expenditure remains stable in the face of external price shocks. However, the stylized fact that total private saving, including business saving in inflation–adjusted terms remained reasonably stable throughout the 1970s and 1980s in the face of severe terms of trade shocks contradicts this. Murphy (1989) using a macroeconometric model, also shows that fluctuations in commodity prices, the major cause of terms of trade movements, had a quite limited influence on the increase in the CAD in the 1980's.

Nevertheless, the terms of trade are likely to have contributed to measurement noise in the external accounts through valuation effects on the CAD (discussed in Chapter 2) induced by terms of trade driven exchange rate fluctuations. This is because
empirically, as Blundell-Wignall and Thomas (1987) argue, there is an apparent inverse relationship between Australia's terms of trade and its exchange rate, defined as the price of foreign currency.

5.2.5 Monetary Policy

How changes in the stance of monetary policy affect the external accounts is a largely unresolved theoretical issue, since, as argued in the preceding chapters, existing models are somewhat ill equipped to deal with the consequences of monetary expansions and contractions for the CAD and NFI in an integrated way.

The MF approach for instance is most often used to predict the external consequences of monetary policy changes and, as outlined in Chapter 3, this model under the perfect capital mobility assumption implies that the trade account tends to surplus (deficit) following a monetary expansion (contraction). The main channel of influence is through financial capital flows affecting the nominal exchange rate and hence net exports by virtue of the Marshall–Lerner condition. Bewley and White (1990) have used the MF model in the Australian context to argue that the tighter monetary policy of the late 1980's caused a higher real exchange rate and hence widened the CAD. However, the MF transmission mechanism provides a less than satisfactory understanding of the process of external account determination for the many other reasons already outlined in Chapter 3. If financial capital is less than fully mobile in the MF sense, questions then arise as to the impact of domestic interest rate changes on total expenditure and hence imports. Additionally, whenever the monetary stance tightens, there is the further complication of the net income paid abroad component of the CAB increasing, due to rising interest payments on domestic currency debt owned by foreigners.
Whether monetary policy affected the external accounts any differently in the 1980s as compared to the 1970s is also clouded by disagreement over the actual stance of policy over the period. For instance, Macfarlane (1991) argues that the lower inflation rates in Australia in the 1980s, combined with the fact that it had the highest real interest rates in the OECD indicated that the 1980's was not a decade of easy money, with some episodic exceptions (for example in 1983 during the recession and also 1987, following the worldwide stockmarket crash).

Real interest rates in Australia were generally higher in the 1980's than in the 1970's, coinciding with stronger sustained output growth, but this was also true for many other OECD countries. Short term interest rates were considerably more volatile and higher than long term rates throughout the 1980's (See Chart 2.17) with the inverse yield curve providing further evidence of the tightness of monetary policy, particularly during the last half of the decade. Valentine (1991) on the other hand, argues that monetary policy tended to be overly expansionary throughout the 1980s, as indicated by relatively high money base growth. However, by the end of the 1980's money base growth was minimal.

The short term and long term influence of domestic monetary policy on the external accounts raises questions about the nature of the linkages between the money supply, inflation, interest rates, exchange rates and the external accounts themselves. Any consideration of the possibly different impact of monetary policy in the 1980's over the 1970's must however acknowledge both the move to a floating exchange rate from December 1983 as well as the host of other deregulatory reforms affecting domestic and international transactions introduced throughout the 1980's.
Under the managed exchange rate system of the 1970's, with some degree of financial capital mobility, a rise (fall) in official reserve assets could be expected to accompany attempts to contract (expand) the domestic money supply through open market operations in bonds. Accordingly, there should have been an immediate impact on the official component of the capital account since rises (falls) in reserves are recorded as part of official capital outflow (inflow). Consistent with the MF model, the move to a floating exchange rate should also have enhanced monetary control and hence improved the effectiveness of monetary policy as an income stabilisation tool.

However, the deregulatory reforms also increased the financial independence of domestic firms, enabling them to borrow offshore whenever monetary policy tended to push domestic interest rates above foreign rates. Conceivably, irrespective of RBA attempts to stem aggregate expenditure by limiting the availability of credit through financial intermediaries by monetary restraint, firms wishing to increase investment could borrow foreign exchange offshore. These funds could then be used to buy imported capital goods, thus giving effect to real international capital transfer. Under such circumstances, monetary restraint would simultaneously increase the CAD and the KAS, to the extent that it may restrict the domestic supply of loanable funds made available through the financial system. As a corollary, monetary expansion should narrow any external imbalance.

These effects are evident from Figure 5.2, based on the loanable funds approach to the external accounts, outlined in Chapter 4.
To the extent that a restrictive monetary policy implemented by the RBA causes a contraction of loanable funds made available by financial intermediaries, notably banks, the domestic supply of funds schedule shifts upwards. Under the assumptions of full capital mobility and an exogenous world interest rate ($r^*$), the CAD and NFI would increase following the monetary restriction, for given funds demand. In the figure, NFI increases by distance AB from BC to AC. Interestingly, this approach, like the MF model, suggests that the money supply and the CAD are inversely related. Unfortunately, however, the approach also fails to address the important role that money supply changes play in generating domestic inflationary pressures.

Domestic and international linkages between inflation, market interest rates, saving, investment and returns on real capital obviously provide a basis for better understanding of the overall monetary policy–external account relationship. These linkages will be considered again shortly when examining what capital mobility really means. As background to that discussion, we first consider the deregulatory revolution of recent
decades which greatly transformed the environment in which saving and investment decisions were made.

5.3 **Capital Market Integration and Capital Mobility**

In the wider international context, the presumption throughout the Bretton Woods era that free international trade in goods was to be encouraged did not extend to financial assets and no institutional framework analogous to GATT was established to negotiate on government imposed impediments to capital movements. Official attitudes to controlling international capital flows have changed dramatically since the Second World War. Whereas the IMF articles of agreement, expressing earlier attitudes to financial capital movements actually sanctioned exchange controls as a supplement to exchange rate management, in contrast, the OECD's Code of Liberalisation of Capital Movements, first drafted in 1961, proposed that international capital movements be progressively freed.

With the breakdown of the Bretton Woods system of exchange rate management, and in accordance with the OECD Code, financial markets were progressively liberalised with implications for capital flows, the effectiveness of monetary and fiscal policy and nations' external accounts. A range of deregulatory actions affecting domestic and international financial transactions were implemented, including the abolition of capital controls and interest rate ceilings, as well as the entry of foreign financial institutions into domestic markets. These policy initiatives, combined with technological progress in telecommunications, greatly reduced transactions costs and widespread financial innovation, have broken down barriers separating economies' financial markets. (See Frankel (1979,1983,1985), Aliber (1980), Hooper and Morton (1982), Shafer and Loopesko (1983), Meese and Rogoff (1985) Sachs (1985) Fukao and Hanzuki (1987) Isard

Historically, the process of capital market integration began gathering pace from the mid 1970's with the relaxation of capital controls in the United States and Canada. By the end of the 1970's, the United Kingdom had abolished all exchange controls and throughout the 1980's, Japan gradually relaxed restrictions on foreign outward investment by institutional investors. Liberalisation of Australia's financial markets was virtually complete by the mid 1980's, as it was in New Zealand and the Scandinavian countries. France and Italy moved more slowly but had eliminated most controls by the middle of 1990. With the exception of Spain, Portugal and Greece, which maintain relatively stringent regulations over domestic and international financial transactions, institutional barriers impeding the movement of financial capital within the OECD area have now largely disappeared.

Both domestic and international financial transactions were tightly controlled in Australia up until the early 1980's. For instance, at the domestic level there were quantitative limits on bank lending, deposit and lending rates were controlled and bank reserves were subject to the Statutory Reserve Deposit (SRD) arrangements whereby trading banks had to lodge a proportion of their deposits with the RBA. As well, the Liquid Assets and Commonwealth Government Securities (LGS) convention bound the trading banks to hold part of their deposit base as liquid assets, largely as Commonwealth Government bonds.

In the 1970's, a number of restrictions impeded international capital inflows and outflows as described by Argy (1987) and Laker (1988). For example, whenever the authorities considered capital inflows excessive, embargoes on short term offshore borrowing were imposed, as happened in 1972, 1974 and 1977. An instrument called the
Variable Deposit Ratio (VDR) also sought to dissuade domestic firms from foreign borrowing, which as Sieper and Fane (1982) argued, mostly affected large scale, long term projects.

These restrictions had largely been removed by the end of the 1970's. Thereafter, external borrowing began to rise sharply, as highlighted by our second stylized fact of Chapter 2. Throughout the 1980's, most remaining regulatory controls governing domestic and international financial transactions, as well as regulations governing foreign investment, were abolished in the wake of the Campbell and Martin Reports on Australia's financial system. A detailed chronology of financial deregulation which liberalised domestic transactions is contained in Appendix 5.2 and those measures which freed international transactions are listed in Appendix 5.3.

Deregulation proceeded apace in Australia essentially because there was widespread acceptance that microeconomic efficiency gains could be realised by removing domestic interest rate distortions and by fostering increased competition between financial intermediaries. Deregulation was also expected to improve the effectiveness of monetary policy as a macroeconomic stabilisation instrument. (See Harper (1986) for related discussion.) Accompanying the deregulatory changes were strengthened prudential supervisory arrangements. Capital backing of banks was the basis of prudential regulation and guidelines consistent with international practice were issued by the RBA in 1988. These set out the appropriate ratio of capital reserves banks were obliged to hold against risk weighted assets and were intended to strengthen the capitalisation of banks and hence the security of the financial system.

The main focus here is the liberalisation of international, as opposed to domestic, financial transactions, and the relaxation of official foreign investment guidelines as the primary influences on the saving–investment imbalance. Though it may be argued that
the deregulation of domestic financial transactions could have produced a once-only increase in consumption, because consumer credit became more readily available, the stylized fact remains that the private saving ratio remained fairly stable over the period. Nonetheless, Blundell-Wignall et al. (1992) provide econometric evidence suggesting that financial liberalisation altered the nature of consumption functions for Australia, the United States, Japan and Canada in the 1980's. These authors argue that consumption became less responsive to fluctuations in income compared to the 1970's because the easing of liquidity constraints assisted consumption smoothing behaviour. However, they do not suggest there was a step increase in consumption over the 1980's as a result.

Moreover, though difficult to assess, it is possible that the quality of domestically financed investment could have risen because domestic deregulation improved the allocation of domestic saving, allowing it to finance more profitable investment opportunities. It is also true that some deregulatory measures had direct implications for both domestic and international financial transactions. For example, the licensing of an increased number of foreign banks increased competitive pressures domestically, at the same time as it facilitated access to new sources of foreign saving.

The volume of both capital inflows and outflows increased in the 1980's and the single most significant deregulatory measure which contributed to this was the abolition of remaining exchange controls over the movement of financial flows into and out of Australia in December 1983, at the same time as the currency was floated.

Whereas foreign banks had lent most of the funds at the beginning of the decade, thereafter there was also extensive fundraising through the Eurodollar markets. This was not, of itself, a product of deregulatory measures in Australia, but a consequence of institutional developments in financial markets abroad. Moreover, though foreign borrowing was prevented from appearing on domestic banks' balance sheets in the 1970's,
this changed rapidly from the early 1980's as soon as deregulatory measures allowed. The extent to which Australian banks increasingly channelled foreign funds to the private and public sectors, both as significant borrowers and lenders in international capital markets, is evident from Chart 5.4. This chart, based on RBA data, reveals the gap which quickly developed in the 1980's between banks' own external liabilities in the form of foreign debt and their assets in the form of lending abroad.

In terms of public sector borrowing abroad, there are two components; borrowing undertaken by public trading enterprises (PTE's) and general government borrowing. In most respects, external borrowing by PTE's is similar in nature to borrowing by private enterprises. However, the sharp increase in foreign loan raising by PTE's was a consequence of a specific deregulatory measure permitting PTE's to borrow abroad to finance increased investment activity, for instance by state electricity authorities.

As regards official or general government borrowing abroad, it remained reasonably low throughout the 1980's reaching a peak of 2.3 percent of GDP in 1985–86. With the fiscal consolidation and budget surpluses of the late 1980's, officially incurred foreign debt was partially extinguished. However, this was more than offset by foreign purchases of previously issued public debt, denominated in Australian dollars, which increased the measured value of net official external debt over the same period.

With the removal of restrictions on outflows, Australian direct investment abroad also grew quickly, to a large extent financed by foreign borrowing (Tease (1990), Robertson (1990)), such that gross capital inflows exceeded the CAD throughout the 1980's.
Chart 5.4  External Borrowing and Lending by Australian Banks
In short, the abolition of official restrictions transformed the Australian financial sector from being heavily regulated and segmented, into one that was lightly regulated and internationally integrated. Access to international financial capital and services increased greatly, due in particular to the abolition of exchange controls in Australia and the entry of foreign banks. Combined with the removal of capital controls abroad and the development of the Eurodollar market, this boosted resident firms' borrowing opportunities and implied that capital mobility was significantly enhanced in the 1980's compared to the 1970's.

5.3.1 Defining Capital Mobility

A unifying theme of Chapters 3 and 4 was the macroeconomic significance of capital mobility. In Chapter 3 for example, we saw that the polar assumptions of perfect versus imperfect mobility yielded markedly different results about the effectiveness of policy instruments in the MF model. In the MF model, perfect capital mobility relates bond yields across borders, although as mentioned in Chapter 3, this approach fails to allow for exchange rate expectations which are implicitly assumed static. This implies that the international equalisation of interest rates is essentially determined in the first instance by the interaction of stock domestic money demands and supplies. With fixed price levels, nominal and real equalisation of interest rates is the same.

In contrast, Chapter 4 which outlined capital theoretic approaches to the external accounts showed that full capital mobility, understood in both a real and financial sense, unambiguously raised a nation's standard of living when compared to zero capital mobility. Similarly, capital mobility was characterised by the international equalisation of interest rates, but in the models of Chapter 4, the real interest rate, as a measure of the return on the capital stock, was determined by real forces including the eventual international transfer of physical capital. Both Chapters 3 and 4 highlighted the
significance of capital mobility by considering polar extremes. But how do we actually measure international capital mobility and to what extent did the international financial liberalisation just discussed enhance it?

Dornbusch and Giovannini (1990) suggest that when considering the extent of international capital market integration, it is important to distinguish between international asset substitutability and capital mobility. If economic agents are indifferent between holding financial securities at home or abroad for given yield differentials and exchange rate expectations, the assets are perfectly substitutable. The extent of capital mobility governs whether economic agents may achieve desired portfolio holdings and in practice is limited by factors such as ignorance of foreign investment opportunities and the phenomena of country, political and exchange rate risk.

Frankel (1989) goes further and proposes that the extent of capital mobility be tested against a range of conditions. The most comprehensive set of conditions would include (1) closed interest parity, (2) covered interest parity, (3) uncovered interest parity, (4) real interest parity and (5) the extent of correlation between changes in domestic saving and investment (as proposed by Feldstein and Horioka (1980)).

Closed interest parity obtains if financial capital flows equalise interest rates across borders when debt instruments are denominated in a common currency. Covered interest parity holds when the difference between the forward and spot exchange rates entirely reflects interest differentials on debt instruments denominated in different currencies. If covered interest parity does not hold, this suggests there are unexploited profit opportunities from interest arbitrage. Assuming arbitrage, the above equality will only fail to hold exactly if there is uninsurable risk, large transactions costs or exchange controls.

Uncovered interest parity (UIP) holds when capital flows equalise expected rates of return on bonds denominated in different currencies, after allowing for exchange rate
expectations. (See Aliber (1973)) It may be expressed as \( i - i^* = s_e \) where \( s_e \) is anticipated currency depreciation, \( i \) is the domestic nominal interest rate and \( i^* \) the foreign nominal interest rate. For UIP to hold empirically ex post, we must assume that agents are risk neutral and that observed nominal interest rates incorporate a premium for (rationally) expected future exchange rate movements. Alternative forms of UIP assuming, say, adaptive expectations could conceivably hold ex ante, though most specifications jointly propose risk neutrality and rational expectations in testing the relationship.

Real interest parity is simply the equalisation of real interest rates, \( r = r^* \). For real interest parity to hold however, both UIP and purchasing power parity (PPP) must hold. A simple proof of this is as follows. Since real ex ante interest rates at home and abroad are \( r = i - \pi_e \) and \( r^* = i^* - \pi_e' \) (where \( \pi_e \) and \( \pi_e' \) are the expected inflation rates at home and abroad), it follows that the real interest differential is \( r - r^* = i - i^* - \pi_e + \pi_e' \). Since the UIP condition is \( i - i^* = s_e \) and ex ante PPP is simply \( \pi_e - \pi_e' = s_e \), both UIP and PPP must hold exactly and at all times to equalise real interest rates internationally.

Another test of capital mobility ascribed to Feldstein and Horioka (1980) adopts a quite different perspective to the above conditions, which test capital mobility by measuring returns on debt instruments. The Feldstein–Horioka (FH) interpretation of capital mobility focuses on aggregate investment–saving imbalances and suggests that if international capital markets are highly integrated then there is likely to be little correlation between increases in the level of saving in one particular country and that country's level of investment.

Another way of putting this is that in an open economy, saving and investment behaviour should be independent of each other in the spirit of the Fisher separation theorem as explained in Chapter 4. If saving is free to move internationally, it will be
used to finance additional investment around the globe with little used to finance extra
investment at home. The FH proposition has been perceived as an alternative measure of
capital mobility and has spawned an extensive empirical literature. Since it affords an
explicit role to the saving and investment aggregates on which much of this and earlier
chapters have focussed, we will consider the issues raised by the FH condition in some
detail.

In their original paper, Feldstein and Horioka empirically tested an equation for
OECD economies of the form \( I/Y = a + bS/Y + \varepsilon \), where \( a \) and \( b \) are co-efficients, \( \varepsilon \) is
a stochastic error term and the other nominal variables are as earlier defined. In short,
they suggested \( b \) should be zero if capital was perfectly mobile. However, Feldstein and
Horioka's evidence of a high correlation between domestic saving and investment levels
for OECD countries implied a low level of international capital mobility with results for
the period 1960–1974 showing that domestic saving passed into domestic investment (the
"savings retention co-efficient") almost one to one. Subsequent empirical studies tended
to confirm this (See for instance Fieleke (1982), Feldstein (1983), Penati and Dooley
(1984), Murphy (1984), Caprio and Howard (1984) and Dooley, Frankel and Mathison

The FH approach to measuring capital mobility was subsequently criticized by
several authors. For example, Murphy (1984) and Obstfeld (1986) show that correlations
between saving and investment can be obtained in the presence of various shocks under
conditions of perfect mobility, as traditionally understood in terms of the interest parity
conditions outlined above. In particular, Obstfeld argued that saving and investment may
endogenously depend on population and productivity growth. Others, including Tobin
(1973), Westphal (1983), Summers (1985) and Bayoumi (1990) claimed that, to minimize
divergences between domestic saving and investment, governments tended to automatically
react to current account imbalances through fiscal responses, by changing public saving and investment to offset external account imbalances. This "policy-reaction" argument is the "twin deficits" hypothesis in another guise and implicitly rejects the RE proposition, though this rejection seems quite acceptable in light of the empirical evidence.

Feldstein and Bacchetta (1989) more recently addressed many of the theoretical and empirical criticisms levelled against the original FH methodology and found that although the savings retention coefficient had fallen in the 1980's for OECD countries, reaching a low of only 0.58 for the period 1983–1987, it was still higher than would be expected in a world of high capital mobility. High saving-investment correlations cannot however be interpreted in isolation as evidence of imperfect capital mobility since the FH definition of capital mobility only holds if real interest parity holds and the real interest rate is determined exogenously to the country in question. Moreover, all studies to date have worked with nominal saving and investment data. Hence, they do not allow for the distortionary effects of inflation on the saving-investment imbalance as discussed in Chapter 2.

To demonstrate why the interest parity conditions and the small country assumption are necessary and sufficient for the FH condition, consider Figure 5.2 below. Assume a small economy is initially in equilibrium, saving equals investment and all of the parity conditions outlined above are fulfilled, so that $r = r^*$. According to the FH proposition, perfect capital mobility would obtain if, following an increase in domestic saving, foreign outward investment increases by distance a, as manifested in an inflation-adjusted CAS. However, for this to occur all other conditions for capital mobility must be fulfilled since the domestic interest rate must still equal the foreign rate.
Alternatively, if capital is completely immobile according to the FH proposition, the additional saving generates increased investment at home and instead of capital outflow, the domestic interest rate falls below the world rate. In light of the analysis of foreign investment in Chapter 4, macroeconomic welfare is maximized if a CAS is generated, but is suboptimal if immobility prevails and the interest differential widens.

5.3.2 Increased Capital Market Integration and Stock Adjustment

In Chapter 4 we used the intertemporal approach to the external accounts to demonstrate the welfare benefits of full capital mobility against capital immobility. Elements of that approach can now be applied to model the stock adjustment effects of financial liberalisation which integrated Australia's capital markets more closely with other international capital markets. The approach also helps explain some of the stylized facts of Chapter 2.
Whereas much of the foregoing discussion of the external accounts canvassed influences on flow magnitudes determining the external accounts in the 1980's, this section also shifts attention to aggregate stocks. In particular, we seek to explain the effect of the international financial liberalisation in the early 1980's on the stock of Australia's external indebtedness, as well as the associated rise in the capital stock and wealth which occurred over this time.

To illustrate the effect of international financial liberalisation on investment, foreign debt, the capital stock and wealth consider Figure 5.3 below. The analysis is initially restricted to firms' behaviour. As in Chapter 4, we invoke an investment opportunities frontier which captures firms' ability to transform current investment into a future stream of income. Here however, we now focus for the first time on the stock adjustment aspects of increased capital market integration and assume all variables are expressed in real terms.

![Figure 5.4](image-url)  
*Figure 5.4 - International Financial Liberalisation and External Debt*
With prohibitive exchange controls in place, domestic investment would only proceed up to the point where the return on capital, net of depreciation, was equal to the domestic interest rate, \( r \). In the figure, investment would be \( E \) and the present value of the future income stream would be \( W_1 \). In a certain world with a competitive capital market and no transactions costs, the present value of firms' investment is also the market value of the firms' common shares, which in this simple model equals the value of the economy's assets. Optimal investment decisions by firms, maximize the net present value of investment and also maximize the value of national assets.

After dispensing with exchange controls and other institutional impediments to foreign investment, it becomes possible for firms to borrow at a lower rate of interest \( (r') \) prevailing in international capital markets. In Australia's case, this is consistent with the positive ex post interest differential between domestic interest rates and the lower implicit interest rate on foreign debt shown in Chart 19 of Chapter 2.

With reference to the above figure, firms borrow \( H' \) abroad after deregulation which then becomes the stock adjustment increase in foreign debt. By investing \( E + H' = I \), firms generate future income of \( Y_d \), the present value of which is \( Y_d/(1+r') \) or, \( H' + W_2 \). However, since \( H' \) plus \( r' \) in interest must eventually be paid to foreign lenders, the future income accrual to residents shrinks to \( Y_3 \). The present value of the future income stream to domestic residents, is

\[
\frac{Y_4 - H'(1+r')}{(1+r')^2} \quad \text{or} \quad W_2.
\]

Hence, this approach implies that under conditions where external borrowing is freely permitted, and cheaper funds are available from somewhere abroad, an increase in external indebtedness funding additional real investment should lead to a rise in the value
of national net worth, provided the increase in the present value of the capital stock as
reflected in equity prices exceeds the increase in external indebtedness.

Put another way, the increase in external liabilities is more than offset by an
increase in the market value of assets, such that national net worth rises, where net worth
is defined as the difference between national assets and external liabilities. We note from
the figure that this must be so since the increase in the future income stream made
possible by the external borrowing $Y_4 - Y_2$, exceeds future repayments, $H'(1+r')$.

We may also think of the dynamics of the increase in real investment in terms of
the q theory exposited in Chapter 4. Since $r = f_q/q$ initially, with a lower foreign interest
rate, q will immediately increase, raising the market price of capital above its replacement
cost. This induces the additional real investment, which eventually lowers the marginal
product of capital.

Though the emphasis so far has been on the use of external borrowing to finance
additional domestic investment, the intertemporal model also shows that it is possible to
increase the value of national assets and hence national net worth if the foreign loans are
used to finance investment abroad. In such a case, national net worth increases if the net
present value of the additional investment abroad exceeds the value of the foreign
borrowing used to finance it. This is of relevance since much of the increase in
Australia's external debt in the 1980's was actually used to finance investment abroad.
(See Robertson (1991)).

In summary, this simple variation of the Fisherian approach of Chapter 4 suggests
that other things equal, international financial market liberalisation may lead to an
immediate stock adjustment, as reflected in a sharp increase in external debt, higher real
investment and a rise in national wealth. The following chapter provides strong
quantitative support for such a process.
To simplify exposition, the above discussion ignored the effects of increased capital market integration on national saving. As discussed in Chapter 4, the impact of changes in the interest rates on saving is somewhat ambiguous in a theoretical sense, since there may be offsetting income and substitution effects. If the substitution and income effects of a fall in the cost of capital exactly offset each other, present saving becomes inelastic with respect to the interest rate.

Using this assumption, standard for instance in textbook discussion of closed and open economy Keynesian models, where the interest rate is not an argument in the consumption function, we can explicitly incorporate saving into Figure 5.3 by imagining consumption indifference curves tangential to points $Y_2$ and $Y_3$. The wealth levels $OW_1$ and $OW_2$ then represent the net present value of additional future consumption stemming from additional investment.

The above model also implicitly assumes "fundamental valuation efficiency" which according to Tobin (1984) prevails when the prices of financial claims to capital accurately reflect all future payments to which those claims give title. Many would argue, however, that "fundamental valuation efficiency" does not always prevail, as evidenced by the phenomenon of speculative bubbles followed by sharp collapses in various asset markets as with the behaviour of stock markets in 1987. (For related discussion, see Blanchard (1979), Blanchard and Watson (1982) and Bisignano (1991)). This then raises perennial and complex questions about the nature of expectations formation and financial market efficiency, and indeed the very worth of financial market activity. (On the latter aspect, see Keynes (1936) Ch 13 for an extremely pessimistic interpretation.) Many of these issues remain, and perhaps will always remain, unresolved and a full discussion lies beyond the scope of this chapter. Suffice to say that we presume over longer periods, such as a decade, that the valuation of the private capital stock is at least roughly efficient,
in an "on average" sense and that financial markets are not persistently prone to waves of irrational behaviour.

Nonetheless, it is still possible to capture the effects of well founded revisions to expectations about future income streams in the above model. If, for instance, expectations were suddenly revised upwards on the basis of new information about investment prospects, the investment opportunities frontier would bow upward from the origin. Though not drawn in the figure above, it is relatively straightforward to demonstrate that under the assumptions of the approach, an upward revision of investment prospects would further increase foreign debt, investment and national net worth, provided foreign lenders concurred with the upward revisions. If they did not, a risk premium would then be added to the foreign interest rate on offer limiting the investment, capital stock and external debt increase.

We can also model the effects of increased capital market integration on the external accounts in terms of the simple flow of funds framework used earlier. For instance, with reference to Figure 5.4, if capital controls were initially prohibitive, the domestic interest rate would be domestically determined at real interest rate \( r \), corresponding to the intersection of the interest inelastic saving schedule, and the downward sloping investment schedule.

Following deregulation which permits foreign borrowing at a lower real interest rate, the domestic real interest rate would fall to \( r' \), the foreign real interest rate, assuming real interest parity holds. Simultaneously, there would be a rise in investment financed by foreigners, and hence a rise of AC in the current account deficit. If capital was initially only partially mobile, on account of quantitative capital controls which limited foreign borrowing to the extent of distance AB, then the interest differential would be \( r' - r' \) which should disappear after the abolition of exchange controls, again assuming fulfilment
of the parity conditions. If the nation was initially a net debtor, saving would be defined as domestic saving i.e. net of interest payments paid on previously accumulated external debt. It also follows from the above diagram that if the parity conditions are fulfilled after deregulation, then the wider is the initial interest differential, the lower is the correspondence between saving and investment in the FH sense at a given level of income.

![Diagram](image)

**Figure 5.5 — Capital Market Integration and the External Accounts**

### 5.3.3 Empirical Evidence on Capital Mobility

In surveying the empirical evidence on capital mobility in light of the recent widespread liberalisation of financial markets, Blundell-Wignall and Brown (1991a, 1991b) conclude that capital mobility increased in OECD countries during the 1980's and was indeed highly mobile if judged against some but not all of the above capital mobility criteria.

For instance, on the basis of the closed interest parity condition, interest differentials had largely disappeared for the major OECD countries by the mid 1980's. This is of particular relevance for Australia since the Euro-currency markets were the
fastest growing source of capital funds in the 1980's, allowing much of the increased foreign debt to be denominated in Australian dollars. In 1986–87 and 1987–88 gross flows from these markets by themselves approximated the nominal CAD. See Chart 5.5.

Moreover, the massive increase in funds shown earlier under the source item "international capital markets" in Table 5.2 which by the end of the 1980's accounted for around thirty percent of gross capital inflow compared to a negligible amount at the beginning of last decade, is doubtless due to the effects of worldwide financial deregulation in facilitating capital mobility.

There is also strong evidence in favour of covered interest parity holding as earlier confirmed by, amongst others, Levich (1985) for the major OECD currencies and Turnovsky and Ball (1983) for Australia. On the contrary, the international and Australian evidence does not support uncovered interest parity. (See Hodjera (1973), Bryant (1975), Dooley and Isard (1980), Hansen and Hodrick (1980), Cumby and Obstfeld (1981), Bailey, Baillie and McMahon (1984), Loopesko (1984), Frankel and McArthur (1988) for international studies, and Tease (1988) for Australia.) This failure of UIP can perhaps be explained with reference to time varying risk premia and irrationally formed expectations about exchange rate movements, the determination of which remains poorly understood. Yet it seems plausible that exchange rate uncertainty has increased during the floating era, characterized as it is by such wide nominal exchange rate fluctuations (See Krugman (1989) for related discussion.)
CHART 5.5  NEW ISSUES OF $A EUROBONDS
Tests of real interest parity also reveal that, internationally the degree of co-movement of real interest rates has not increased markedly since the onset of financial liberalisation, nor has the real interest differential narrowed by as much as could be expected. (See Mishkin (1984a, 1984b), Mark (1985) Cumby and Mishkin (1986), Gaab, Franzoi and Horner (1986) and Frankel and McArthur (1988)). However, Tease (1990) suggests that for Australia, real interest differentials were closer to zero on average in the 1980's than previously, which is consistent with increased capital mobility facilitated by greater capital market integration. Nonetheless, given the failure of UIP to hold and the overwhelming evidence against PPP, particularly over shorter periods, it should not be surprising that real interest parity also fails to hold, for as derived above, UIP and PPP are preconditions for real interest parity.

Finally, as mentioned earlier, several empirical studies have confirmed that, on the basis of the FH measure, capital mobility increased in the 1980's. This result has also been supported with particular reference to Australia by Monadjemi (1990) and Tease (1990) who found that the correlation between saving and investment weakened significantly over the 1980's, although these authors did not use inflation-adjusted gross saving and investment data, which is not yet available for most OECD countries. Further evidence of a weakening of the correspondence between saving and investment in Australia in the 1980's is simply provided by the increase in NFI.

In summary, though it appears that capital mobility still lies somewhere between the polar extremes used as a pedagogical device in earlier chapters, the empirical evidence suggests that, on balance, capital mobility increased substantially in the wake of international financial liberalisation. Capital mobility remains less than perfect because increased exchange rate volatility under floating rates has tended to reduce financial asset substitutability; other reasons would have to include the inherent riskiness of foreign
investment, the threat of the re-imposition of official capital controls and remaining institutional practices which ensure part of domestic saving is directed largely toward financing strictly domestic activity, as for example with private household saving lodged with specialized financial institutions such as building societies.

Furthermore, some direct foreign investment may occur more for the purpose of overcoming goods and services trade restrictions than for strictly obtaining a higher rate of return on capital (See Caves (1971)). There is also evidence that fund managers of large institutions have actively sought to diversify asset holdings internationally in order to minimize risk due to uncertain returns (See Solnik (1976, 1991) and Bank for International Settlements (1986)). Hence, in practice, consistent with standard portfolio theory, capital flows may be driven to a large extent by the expected variance of returns on capital and not just the return itself. (See also Grubel (1968)).

Though we argued in Chapter 4 that the greater is capital mobility, the greater the macroeconomic welfare gains, there is a contrary view which suggests capital mobility has now become "excessive". Tobin (1978) and Dornbusch (1986), for instance, reflecting Keynes (1936, Ch. 13)) views on the inherent irrationality of financial markets, emphasize destabilising exchange rate movements which cause sustained deviations of real exchange rates from fundamentals with adverse implications for domestic inflation, output and employment.

Tobin (1978) in particular, has proposed that international capital mobility be limited by throwing some "sand on the wheels" of the international financial system; specifically, by imposing a worldwide financial transactions tax of one percent on the value of any spot conversion of one currency into another. However, it would obviously be difficult to apply such a tax consistently world wide. More importantly the proposal ignores the macroeconomic welfare losses that could result if foreign capital, irrespective
of its maturity, is prevented from flowing to areas where it earns its highest risk adjusted rate of return.

5.4 Conclusion

International capital flows are ultimately determined by factors affecting saving-investment imbalances across countries. This chapter canvassed a range of these factors to help determine the source of the increase in NFI and real capital transfer to Australia in the 1980's. For saving, we considered the possible effects of longer term demographic changes, terms of trade shocks and the stance of fiscal policy. Of these, changes in public saving due to fiscal activity seem to have most influenced total domestic saving.

It was argued however, that the rise in private investment in the 1980's was a relatively more important determinant of the increased NFI. In turn, this increased investment was driven by newly perceived investment opportunities and enhanced profitability, as reflected in rising equity prices. Many of these additional opportunities were realised within the 1980's because enhanced international financial intermediation facilitated additional external borrowing, as manifested in the sharp rise in foreign indebtedness.

The Australian financial sector was transformed in the 1980's from a heavily regulated and segmented financial structure into a system which was lightly regulated by international standards. Financial liberalisation in Australia and throughout the OECD region, along with continued innovation in the Eurocurrency markets, improved access to financial capital and the degree of capital mobility therefore increased. However, the enhanced mobility of capital and global integration of financial markets was a facilitating, not motivating, factor behind the growth and persistence of Australia's KAS, the size of which was essentially determined by the rise in real national investment.
Appendix 5.1

Deregulatory Measures Affecting Domestic Transactions

May 1980:  Limit on trading banks' ownership of merchant banks increased from 33.3% to 60%.

December 1980:  Removal of interest rate ceilings on deposits with trading and savings banks.

August 1981:  Minimum term for trading bank certificates of deposit reduced from 3 months to 30 days.


March 1982:  Savings banks permitted to accept fixed deposits.

June 1982:  Reserve Bank of Australia (RBA) ceased providing quantitative lending guidance to trading and savings banks.

- Relaxation of limitations on the assets of authorised dealers.
- Introduction of a tender system for Treasury Bond sales.

August 1982:  Relaxation of controls on the assets of savings banks.

- Commonwealth bank account debits (BAD) tax introduced.

January 1983:  State financial institutions duty (FID) first introduced.

August 1984:  Savings banks permitted to offer cheque accounts.

- Withdrawal of prohibition on the payment of interest on short-term trading bank deposits. Removal of limits on the size of fixed deposits with savings banks.
- Removal of limitation on trading bank ownership of merchant banks.
- Trading banks permitted to borrow funds for terms in excess of four years.

September 1984:  30/20 rule providing tax concessions to life insurance companies and superannuation funds holding at least 30 per cent of their assets in government or semi-government securities abolished.

- Maximum permissible individual holdings in a trading bank increased from 10 per cent to 15 per cent.
April 1985: Lifting of all bank interest rate ceilings, except for housing loans of under $100,000.

May 1985: LGS convention replaced by the Prime Asset Ratio (PAR), with banks required to hold 12 per cent of Australian dollar liabilities in prime assets such as cash and government securities.

July 1985: Treasury indexed bonds issued.


April 1986: Interest rate ceilings on new bank housing loans under $100,000 removed, with a subsidy paid to savings banks to maintain existing loans at the rate of 13.5 per cent per annum.

June 1986: Banks required to report all banking group exposures to individual clients exceeding 10 per cent of banking group capital.

April 1987: Abolition of deposit subsidy scheme for savings banks operative since April 1986.

Removal of limitations on ownership of stockbroking firms by Australian financial intermediaries.

December 1987: Insurance and Superannuation Commission (ISC) established, with responsibility for supervision of superannuation, life and general insurance (transferred from the Insurance Commission which was abolished).

May 1988: Introduction of 15 per cent tax on the income of life offices and superannuation funds.

July 1988: Changes in provisions relating to superannuation, including rates of tax on funds and benefits, reasonable benefit limits and deductible contributions.


September 1988: Banks' Statutory Reserve Deposit (SRD) requirement replaced by Non-Callable Deposit with the RBA of 1 per cent of total liabilities.


August 1989: Compliance with bank capital adequacy reporting guidelines extended from banking group to consolidated group.
September 1989: Interest paid on non-callable deposits held by banks with the RBA increased from 5 per cent per annum to 5 per cent below the Treasury bond note yield.


May 1990: Banks' PAR requirement reduced from 10 per cent to 6 per cent of total assets, excluding non-callable deposits.

Establishment of an Australian Banking Ombudsman.

Sources:
Reserve Bank of Australia, Bulletin, various.
Appendix 5.2

Deregulatory Measures Affecting International Transactions


October 1983: Trading Banks permitted to hold increased foreign exchange balances.

December 1983: The Australian dollar ($A) was floated and exchange controls were largely abolished, except those relating to $A balances held by foreign official institutions and banks, and the taking or sending of notes and coins out of Australia.

April 1984: Foreign investment policy was liberalised allowing foreigners to acquire shareholdings in resident stockbroking firms.

June 1984: Non-bank financial institutions were authorized to act as foreign exchange dealers and public enterprises were allowed greater access to foreign securities markets.

September 1984: Foreign banks were invited to apply for a limited number of new banking licences.

December 1984: The maximum permitted shareholding by foreigners in Australian stockbroking firms was increased from forty to fifty per cent.

January 1985: Certain restrictions on foreign banks investing in interest bearing $A assets were removed.

February 1985: Sixteen new foreign banks were given approval to establish operations in Australia.

May 1985: Public authorities were allowed to raise funds in the Eurodollar market.

September 1985: Chase-AMP Bank became the first new foreign bank to commence business in Australia.

October 1985: Simplified administrative procedures for assessing foreign investment proposals were announced, as well as a further relaxation of policy guidelines governing real estate purchases and foreign investment in non-bank financial intermediaries.

July 1986: Foreign investment policy guidelines governing the acquisition of manufacturing enterprises and commercial and farm land for development were further liberalised.
August 1986: Maximum foreign ownership of authorized dealers raised from twenty-five to fifty per cent and restrictions on their operations relaxed.

November 1986: Restrictions on purchases of $A securities by foreign governments and their agencies were removed.

April 1987: Foreign takeovers below certain thresholds were exempted from the foreign investment notification and monitoring procedures.

January 1988: Foreign investment policy was liberalised yet again with the elimination of the requirement that Australian enterprises participate with foreign investors in new mining projects.

Sources: as for Appendix 5.2 plus ABS, Foreign Investment Australia, various.
CHAPTER 6

MACROECONOMIC WELFARE GAINS FROM FOREIGN INVESTMENT

6.1 Introduction

This chapter empirically estimates the macroeconomic welfare effects of the increase in Australia's external imbalance and foreign debt in the 1980's, consistent with the stylized facts first presented in Chapter 2 and later interpreted in Chapter 5. The various approaches employed reflect aspects of the capital theoretic models of Chapter 4. The chapter begins by quantifying additional national income flows attributable to the greater international capital transfer to Australia in the 1980's. Next, a balance sheet method is devised which emphasizes international macroeconomic stocks. Stock-change measures of macroeconomic welfare not only reveal the gains in national net worth over the same period, but are adapted to present an alternative flow measure of national income.

6.2 Estimating National Income Gains from Foreign Investment

The theoretical welfare analysis of Chapter 4 implied that increased foreign investment flows may arise in the transition to an equilibrium, characterised by the equalisation of real ex ante rates of return on capital with positive effects on national income. The neoclassical foreign investment approach and the simple saving–investment model of Chapter 5 suggested that, given positive saving, foreign investment can finance that much more domestic investment. This increases the nation's capital stock and hence the possible output generating capacity of the economy.
In the 1980's, just over half the increase in Australia's total capital stock (net of depreciation) was financed by foreign capital inflow, compared to only 16 percent of the increase in the capital stock for the 1970's. Though the costs of foreign-financed capital accumulation are clearly identifiable and appear as part of net income paid abroad recorded in the current account (refer back to Figure 2.1), the additional output attributable to foreign investment is not separately identified in the national accounts.

Figure 6.1 summarises the earlier neoclassical argument which stresses the production, as opposed to disposal, of national income. In the figure, it has been assumed that the supply curve of foreign capital is perfectly elastic at world interest rate, \( r' \), consistent with the small economy assumption.

![Figure 6.1 - Income Gains from Foreign Investment](image)

The national income gain which arises from additional foreign investment of \( OK' \) under competitive conditions is the shaded area and the equilibrium, profit maximizing criterion for employment of capital is \( r^* = f_{K^*} \), where \( f_{K^*} \) is the marginal product of
foreign financed capital, net of capital stock depreciation. In short, as long as additional foreign capital produces more than its servicing cost, then a nation's income increases by more than otherwise (the shaded area).

### 6.2.1 The Accounting Method

A macroeconomic production function may be specified in general terms as

\[ Y = A.f(K, K', L) \]

where \( A \) is a technology parameter representing disembodied technical change. Then, the sources of increased national output can be shown as

\[ dY = f(K, K', L)dA + A.f_k dK + A.f_k' dK' + A.f_L dL. \] (1)

Now \( Y_n = Y - r'(K')K' \)

Therefore \( dY_n = dY - (r'dK' + r K' dK'). \)

If we assume the country is small, it faces a perfectly elastic supply of foreign capital, so that the term \( r K' dK' \) is zero i.e.

\[ dY_n = dY - r'dK'. \] (2)

From (1) and (2), domestic and foreign sources of income growth can be shown as

\[ dY_n = f(K, K', L)dA + f_k dK + f_k' dK' + (f_k dK' - r'dK') \]

\[ \text{domestic sources} \quad \text{foreign source} \] (3)

The final bracketed term isolates the net contribution of foreign capital to growth in national income of a small open economy like Australia. Hence, we may estimate the additional real national income attributable to the increased capital transfer as

\( (f_k - r'dK') \) where \( dK' \) represents foreign investment or the capital account surplus.
foreign financed capital, net of capital stock depreciation. In short, as long as additional foreign capital produces more than its servicing cost, then a nation's income increases by more than otherwise (the shaded area).

6.2.1 The Accounting Method

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dY = f(K, K', L) dA + A.f_K dK + A. f_{K'} dK' + A.f_L dL.
\]

(1)

Now \( Y_n = Y - r'(K').K' \)

Therefore \( dY_n = dY - (r'K' + r_K'K'dK') \).

If we assume the country is small, it faces a perfectly elastic supply of foreign capital, so that the term \( r_K'K'dK' \) is zero i.e.

\[
dY_n = dY - r'K'.
\]

(2)

From (1) and (2), domestic and foreign sources of income growth can be shown as

\[
dY_n = f(K, K', L) dA + f_L dL + f_K dK + (f_{K'} dK' - r'K').
\]

(3)

The final bracketed term isolates the net contribution of foreign capital to growth in national income of a small open economy like Australia. Hence, we may estimate the additional real national income attributable to the increased capital transfer as

\( (f_{K'} - r')dK' \) where \( dK' \) represents foreign investment or the capital account surplus.
Australia's national income in the 1980's should therefore have been that much higher because of foreign investment, if the value of extra national output produced by employing foreign capital exceeded its servicing cost. Therefore a sufficient condition for regarding the increased CAD's and foreign investment of the period positively is that $f_K > r^*.$

As a first step to evaluating the national income gains from foreign investment, it is necessary to estimate an economy-wide production function econometrically, by relating aggregate output to inputs of capital, labour and technology. One possible production function specification is the well-known Cobb–Douglas form, introduced in Appendix 4.1. The specification below adds the possibility of neutral, disembodied technological change and also allows for capacity utilization. It is

$$Y_t = A_t e^{\lambda t} K_t^{\alpha} L_t^{\beta} e^{\gamma U_t} u_t.$$ (4)

where

- $Y$ is GDP in 1984/85 dollars;
- $K$ is total capital stock, net of depreciation, in 1984/85 dollars;
- $L$ is hours worked;
- $U$ is CAI/Westpac measure of capacity utilization divided by 100 so that it ranges from -1 to +1;
- $u$ is stochastic error term assumed to satisfy the usual econometric assumptions;
- $A_t, \lambda, \alpha, \beta, \gamma$ are parameters to be estimated.

A common alternative specification is the constant elasticity of substitution (CES) functional form which allows the elasticity of substitution between capital and labour to be different from one. However, the Cobb–Douglas form has been found to provide an
adequate approximation to an empirical Australian macroeconomic production function (see Carmichael and Dews (1989)).

In equation (4) technological change is assumed neutral (as opposed to labour-enhancing in Carmichael and Dews) and allows levels of utilization of inputs to vary by employing hours worked and a capital utilization adjustment factor. The latter is obtained from the CAI/Westpac survey of manufacturing firms and is the net response of participants when asked about the level of capacity utilization. A net response of zero is taken to represent a 'normal' operating level in the economy, while a positive (negative) net response is taken to represent above (below) normal levels of operation. Finally, the capital stock measure includes private and public capital equipment, dwellings and non-dwelling construction.

Equation (4) was estimated by OLS in log form, using annual data spanning the period 1968/69–1988/89. It may be argued that, because of the possible endogeneity of the labour and capacity utilization variables, a more appropriate method of estimation would be the instrumental variables (IV) technique. This course was not followed for two reasons. First, in keeping with other production function estimation literature, the input variables are assumed exogenous. Second, the justification for IV estimation is prefaced on its theoretical large-sample advantages over OLS. Given an effective sample size of only 20 observations such a justification would not seem warranted. The estimation results are presented in Table 6.1.

All coefficients are of the a priori expected sign and are sufficiently statistically significant to warrant retention. In addition, all diagnostic checks are adequate. Importantly, the capacity utilization and technology parameter estimates are significant and appear sensible. The capital and labour elasticities sum to 1.07 which is statistically
greater than one, suggesting slightly increasing returns to scale over the sample of data employed. Finally, the estimated capital and labour shares of output ($\hat{\alpha}$ and $\hat{\beta}$) appear quite consistent with national accounts data over the period.

Table 6.1 Cobb-Douglas Estimation Results

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>$\hat{\sigma}^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\hat{\lambda}$</td>
<td>.0036 (3.1111)</td>
</tr>
<tr>
<td>$\hat{\alpha}$</td>
<td>.5658 (11.8710)</td>
</tr>
<tr>
<td>$\hat{\beta}$</td>
<td>.5068 (7.7388)</td>
</tr>
<tr>
<td>$\hat{\gamma}$</td>
<td>.0256 (1.7790)</td>
</tr>
<tr>
<td>$\hat{\sigma}^2$</td>
<td>.000074</td>
</tr>
</tbody>
</table>

Diagnostic Checks:

1. Normality of Residuals
   (a) Goodness of fit: $9.137 \chi^2(4)$
   (b) Jarque-Bera: $0.945 \chi^2(2)$

2. Autocorrelation Checks
   (a) Durbin-Watson = 1.557
   (b) Correlogram Portmanteau test = $2.445 \chi^2(5)$

3. Heteroscedasticity Checks
   (a) Breusch-Pagan-Godfrey: $5.549 \chi^2(3)$
   (b) Harvey: $1.776 \chi^2(3)$
   (c) Glejser: $4.732 \chi^2(3)$

4. Curvature Tests
   (a) Ramsey (2): $1.539 \text{ F}(1,15)$
   (b) Ramsey (3): $0.785 \text{ F}(2,14)$
   (c) Ramsey (4): $1.187 \text{ F}(3,13)$

Notes: $A_0$ proved to be insignificant, was dropped, and (1) re-estimated without it.

$t$-statistics appear in parentheses under the estimates.
To obtain actual estimates of the economy-wide marginal product of capital, we differentiate equation (4) with respect to capital

$$\frac{\partial Y}{\partial K} = \alpha A_o^{\gamma} e^{\lambda K} - L e^{\gamma e^\alpha}. \quad (5)$$

Interestingly, the values of the gross marginal productivity of capital generated by the estimated model according to equation (5) were consistently within the range of 18 to 20 percent. Net of capital stock depreciation, these returns were in the range 14 to 17 percent. These relatively high pre-tax returns are not inconsistent with the higher average return on capital over the period, discussed in the previous chapter. Having obtained marginal rates of return, it is then necessary to assume a foreign financed increase in the domestic capital stock is as productive as a strictly domestically financed increase. The final step uses both the marginal product of foreign capital and its cost to compute the additional national income attributable to foreign investment.

In nominal terms, a new series for the cost of foreign capital, $c'$ (an average measure) has already been presented in Chapter 2, where annual net interest and dividends paid to non-residents were expressed as a proportion of the weighted average annual level of net external liabilities. Under the small country assumption, the marginal cost of foreign capital equals the average cost of foreign capital as it is assumed that external borrowers exert no influence on the world interest rate. Therefore, the approximate real annual cost of foreign capital ($r'$) can simply be computed as the previously estimated ex post cost of foreign capital, less the domestic annual inflation rate i.e. $r' = c' - \pi$.

Table 6.2 presents estimates of the extra national income produced by the foreign-financed capital accumulated during the 1980's. In every year, it is evident that the
marginal product of foreign-financed capital easily exceeded the cost of foreign capital, ensuring the sufficient condition for welcoming external imbalances, as stated above, was met. The calculation of the extra national income stemming from earlier foreign investment ultimately relates to the end year chosen, which in this exercise was 1988–89. The additional national income for 1988–89 then reflects the cumulative productivity of foreign capital which was accumulated in the preceding years of the 1980's. However, the real cost of foreign capital varied throughout the 1980's, because world real rates of interest were not constant. Therefore, the cost of foreign capital used in the estimation of cumulative income was that applicable for the year in question, 1988–89. Finally, the inflation-adjusted CAB's of Chapter 2 were used as the appropriate measures of real international capital transfer in the 1980's.

<table>
<thead>
<tr>
<th>Year</th>
<th>( f_{K'} - d_e - r' )</th>
<th>( dK' ) ($)</th>
<th>Extra Y ($)</th>
<th>Cumulative Extra Y ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980–81</td>
<td>0.148</td>
<td>5.25</td>
<td>0.78</td>
<td>0.78</td>
</tr>
<tr>
<td>1981–82</td>
<td>0.143</td>
<td>6.68</td>
<td>0.96</td>
<td>1.74</td>
</tr>
<tr>
<td>1982–83</td>
<td>0.135</td>
<td>2.11</td>
<td>0.29</td>
<td>2.03</td>
</tr>
<tr>
<td>1983–84</td>
<td>0.137</td>
<td>4.70</td>
<td>0.64</td>
<td>2.67</td>
</tr>
<tr>
<td>1984–85</td>
<td>0.140</td>
<td>7.41</td>
<td>1.04</td>
<td>3.71</td>
</tr>
<tr>
<td>1985–86</td>
<td>0.142</td>
<td>5.20</td>
<td>0.74</td>
<td>4.45</td>
</tr>
<tr>
<td>1986–87</td>
<td>0.143</td>
<td>0.54</td>
<td>0.77</td>
<td>5.22</td>
</tr>
<tr>
<td>1987–88</td>
<td>0.145</td>
<td>1.93</td>
<td>0.28</td>
<td>5.50</td>
</tr>
<tr>
<td>1988–89</td>
<td>0.148</td>
<td>11.96</td>
<td>1.77</td>
<td>7.27</td>
</tr>
</tbody>
</table>

**Note:** The depreciation rate, \( d_e \), was estimated as the ratio of the consumption of fixed capital to the weighted average capital stock using data from ABS Cat. 5221.0. These estimates ranged between 3.44 and 3.48 percent over the period.
According to the above estimates, the cumulative gain in national income between
1980–81 and 1988–89 was around $7.27b, or 2.9 percent of real GDP in 1988–89. Income per head in Australia in 1988–89 was around $454 higher in constant price terms than it would have been without the foreign investment of the 1980's.

The estimates in Table 6.2 are of course based on some brave assumptions, one being that real capital is homogenous, an assumption which of course generated the heated capital controversy between the two Cambridges in the 1960's. Not only is it assumed that capital is homogenous in Australia and in the rest of the world, but that it is also relatively homogenous between the two areas. However, for a "technology dependent" economy like Australia, it is possible that technology is partly embodied in imported capital equipment. Hence foreign financed increases in the capital stock could be more productive than domestically financed increases. Accordingly, the above estimates of the productivity of foreign capital and hence the positive national income gains may be, if anything, understated.

6.2.2 The Simulation Method

The estimated Cobb–Douglas production function may be used in another way to approximate the contribution of foreign capital to national income growth. Specifically, given the positive levels of domestic saving during the 1980's, an estimate of the contribution of foreign capital to output generation may be obtained by subtracting foreign investment from total capital and using equation (4) to estimate output with the lower capital stock levels. In conducting this simulation exercise, it is necessary to assume the same time path for net national saving as was actually realized, identical rates of capacity

utilization as actually occurred and the same rate of technical progress, which remains disembodied from foreign capital. As far as labour input is concerned, the actual hours in each period were reduced so that the capital/labour ratio in the simulation was the same as the observed capital/labour ratio. This effectively presumes fixed proportions of capital and labour in production.

Hence, in the simulation, equation (4) estimates the levels of output under the abovedescribed conditions for each of the years 1984–85 to 1988–89. The results are then cumulated and compared with actual output. Since in the exercise, foreign investment is set to zero over the period, the annual real servicing requirement on external liabilities is assumed to have remained the same as it was in the year before the simulation period. Implicitly this also assumes the value of the exchange rate would not have changed. In fact, the Australian dollar depreciated by about 17 percent over the period of the simulation. To the extent the exchange rate would have depreciated anyway, the estimated capital income paid abroad is underestimated. Moreover, to the extent that some substitutability exists between labour and capital, such that labour hours worked would not fall by the same degree as the reduction in capital, then the simulated output estimates are also understated.

Nonetheless, as with the accounting method, the simulation approach suggested Australia's national income was higher as a result of increased capital inflow in the 1980's. Indeed, the results of the simulation exercise revealed a cumulated net benefit to each resident of the order of $740 in 1984/85 dollars resulting from the capital inflow between 1984–85 and 1988–89.
6.3 National Assets, External Liabilities and National Net Worth

Thus far in this chapter, Australia's international macroeconomic performance in the 1980's has been largely cast in terms of the linkages between the external accounts and national output and income flows. However, flow measures are only partially indicative of macroeconomic welfare and should be augmented with stock change measures, especially when evaluating the overall significance of Australia's external debt. The strong rise in external debt in the 1980's highlighted earlier by stylized fact two, was perhaps the single most discussed macroeconomic statistic over this period. However, it has generally been interpreted in isolation, or expressed in relation to macroeconomic flow magnitudes such as the ratio of net external debt to national income.

To understand how the structure of national assets and liabilities changed in practice in Australia during the extensive international financial liberalisation of the 1980's, it is necessary to construct a national balance sheet. This approach relates back to the intertemporal models of Chapter 4 and the treatment of the stock adjustment effects of international financial liberalisation in Chapter 5.

Ideally, national balance sheets should be an integral part of national accounting. They are tied directly to aggregate flows through the national capital account presented in Chapter 2, which records saving and investment aggregates, these in turn having been derived from the income and product accounts. While total domestic investment equals domestic saving plus net capital inflow, national net worth equals total assets less foreign liabilities.

As complements to the flow national income measures discussed at some length in Chapter 2, national balance sheets complete the full System of National Accounts (SNA), as actually recommended by the United Nations (see United Nations (1968)). They should
include all assets and liabilities which have market values and can be expressed in dollar terms. In a globally integrated economic system, market values should, ideally, reflect the prices bid for domestic assets if these assets were offered for sale on international goods, services and financial markets.

In the international literature, Goldsmith and Lipsey (1963) first devised a balance sheet for the United States and thoroughly detailed the conceptual and practical problems that arise with macroeconomic stock estimation. Goldsmith (1985) later extended this approach and provided stylized balance sheets for twenty countries, including Australia, stressing sectoral asset and liability positions but stopped short of identifying overall net worth outcomes. Indeed, in his work on the financial structure of national economies, Goldsmith devoted comparatively little attention to international assets and liabilities. In contrast, the nation's international investment position becomes a central feature of the following analysis.

Initial local attempts at constructing a national balance sheet have been limited to those by James Capel (1989) and Access (1990). Using different approaches to asset measurement, these earlier attempts yielded contrasting results and were not systematically based on officially published stock data expressed at market value. Nor did they try to explain changes in national net worth in the context of the extensive financial liberalisation of the 1980's and the associated rise in foreign investment.

6.3.1 Constructing a National Balance Sheet

There is considerable room for disagreement about the appropriate method of balance sheet estimation. The major questions which inevitably arise are about the scope of assets and liabilities to be included, the sources on which asset and liability data are

* See Postscript 1 on p. 261.
based, how the different assets and liabilities are to be valued, and ultimately, the reliability of the bottom line estimates.

As regards the scope of assets and liabilities for inclusion, the questions that arise are, in practice, largely restricted to the assets side of the national ledger. This is because official foreign investment statistics published by ABS have, since 1980, been expressed at market prices.

The guiding principle used here for asset inclusion is the potential saleability of domestic assets to non-residents. This means human capital is excluded. However, two strictly eligible assets, collectibles (art, jewellery and rare stamps) and publicly owned land, are not included, as data is simply unavailable. To this extent, total national asset entries below are understated.

As regards valuation of assets, the guiding principle is that tangible internationally saleable assets and external liabilities should be recorded at market prices, or where these are not available, at the nearest approximation to market prices (for example, replacement cost in the case of public assets). As we saw in Chapter 5, provided agents are risk neutral, the market value of a capital asset represents the present (discounted) value of the future net income stream from the use of the asset. Valuation at market prices is conceptually consistent with the estimation of flow national income and product, also on a market price basis, although flow national accounting measures, by convention, exclude all capital gains and losses on asset holdings over a given period.

There was a rapid increase in the value of assets located in Australia and in many other OECD countries during the 1980's. (See Urbanski (1990) and Valentine (1990) for further discussion.) Treasury (1990, 1991) and Callen (1991) have captured the effect of this "asset price inflation" in recent estimates of private sector wealth in Australia, using
methodologies which extend Helliwell and Boxall (1978) and Piggott's (1987) earlier work.

Treasury (1991), for instance, provides estimates of the major components of assets held by the private sector, as valued at market prices. These new data provide a crucial and hitherto unexploited link for constructing the national balance sheets shown below. In particular, total assets are determined by summing private and public tangible assets. Given national asset and external liability values, it is then possible to determine changes in national net worth throughout the 1980's.

In estimating net private sector wealth, Treasury (1991) sums the following financial and real assets—base money, bonds issued by governments and public enterprises, the business capital stock (plant and equipment, non-residential buildings and inventories), privately owned dwellings and land, consumer durables and foreign assets (Australian investment abroad). Though bonds and the money base are assets to domestic residents, they are ultimately liabilities of the official sector and hence must be excluded from total assets on consolidation. Therefore, to estimate national assets, it is only necessary to add the private sector capital stock, consumer durables, the public sector capital stock, and the level of Australian investment abroad.

In the following balance sheets, the private sector capital stock is the sum of the business capital and dwelling capital series estimated by Treasury (1991) at market prices. Included within business capital are non-dwelling construction (offices, factories, civil engineering, hotels) and equipment (office equipment, industrial machinery, vehicles, aircraft, ships). Dwelling capital data covers houses, flats and home units.

It is arguable that consumer durables (mainly passenger motor vehicles and household contents) should not be included in estimates of national assets, since by national accounting convention, these form part of measured consumption, which reduces
the domestic pool of loanable funds available for investment. However, consumer durables should be included on the basis of Eisner's (1988) argument that these items are conceptually more akin to investment goods, because they yield a stream of benefits through time, than ordinary consumption items (e.g. food, clothing, entertainment and petrol). Furthermore, consumer durables may, if necessary, be sold second-hand to extinguish liabilities. For comparative purposes, the national asset and net worth estimates presented below will both include, and exclude, consumer durables as part of national assets. Treasury (1991) also provides an historical consumer durables data series.

The public capital stock and public housing stock series, included as separate asset items below, are valued at replacement cost, a proxy for market value. These series come directly from ABS capital stock data and unfortunately exclude public land.

Finally, Australian investment abroad, from ABS foreign investment data, is added to private and public sector capital asset items. "Official" foreign investment includes the foreign assets of governments, whereas "non-official" foreign investment includes the assets of private and public trading enterprises.

Gross foreign investment data presented earlier in Chapter 2 measures foreign ownership of domestically issued bonds, equities, other debt instruments, dwellings and land. Valued at market prices, gross foreign investment represents total external claims on assets located in Australia. National net worth is simply the excess of residents' assets over external liabilities and, analogous to business accounting principles, provides a measure of the extent of national "solvency" when positive.

With this information on data sources and methods as background, a number of stylized balance sheets, showing the value of stock changes over the 1980's between 30 June 1980 and 30 June 1990 are set out below.
In national balance sheet (i), entries reflect market prices or proxies for market prices. In balance sheet (ii), market prices are deflated by the private consumption deflator for the relevant June quarter from the national accounts to enable across year comparison. The private consumption deflator was chosen because, conceptually, as we saw in Chapter 5, net worth embodies present and future consumption possibilities available to domestic residents. National balance sheets (iii) and (iv) are also in market and constant prices respectively but include consumer durables as an additional asset. The "Notes to the Accounts" following balance sheet (i) provide more detailed information on data manipulation and sources. Table 6.3 includes values of assets and claims on assets in 1984–85 prices for the 1980's as a whole.

**National Balance Sheet (i) as at 30 June (Billions of $A, market prices)**

<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Private Sector:</td>
<td></td>
<td></td>
<td>Gross External Debt:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital Stock(a)</td>
<td>147.66</td>
<td>635.04</td>
<td>Non-official(f)</td>
<td>10.77</td>
<td>125.96</td>
</tr>
<tr>
<td>Dwellings(b)</td>
<td>225.56</td>
<td>802.49</td>
<td>Official(g)</td>
<td>5.90</td>
<td>36.08</td>
</tr>
<tr>
<td></td>
<td>373.22</td>
<td>1473.53</td>
<td></td>
<td>16.67</td>
<td>162.04</td>
</tr>
<tr>
<td>Public Sector:</td>
<td></td>
<td></td>
<td>Foreign Equity(h)</td>
<td>23.22</td>
<td>90.23</td>
</tr>
<tr>
<td>Capital Stock(c)</td>
<td>119.71</td>
<td>325.89</td>
<td>Foreign Investment in Australia:</td>
<td>39.88</td>
<td>252.27</td>
</tr>
<tr>
<td>Dwellings(d)</td>
<td>5.26</td>
<td>21.51</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>124.97</td>
<td>347.40</td>
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<td></td>
</tr>
<tr>
<td>Australian Investment Abroad(e):</td>
<td></td>
<td></td>
<td>National net worth</td>
<td>471.86</td>
<td>1624.61</td>
</tr>
<tr>
<td>Non-Official</td>
<td>6.82</td>
<td>66.57</td>
<td></td>
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</tr>
<tr>
<td>Official</td>
<td>6.73</td>
<td>25.38</td>
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<td>13.55</td>
<td>91.95</td>
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<tr>
<td>Total Assets</td>
<td>511.74</td>
<td>1876.88</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Notes to the Accounts:

(a) the private sector capital stock at market prices is defined as the sum of equipment, non-dwelling construction and inventories. It has been derived from the business capital series in Treasury (1991) Table 1, p. 3 which is presented by Treasury net of foreign claims (i.e. corporate equities, net equity in branches and the gross external debt of financial enterprises). These foreign claims have been added back to yield the market value of business capital located in Australia. The estimates of foreign claims are from Reserve Bank of Australia (1991), Occasional Paper No. 8, Table 1.20, p. 42 and Table 1.21, p. 50.

(b) the market price value of private sector dwellings is from Treasury (1991) Table 1, p. 3.

(c) data for the public sector capital stock, defined as the sum of equipment and non-dwelling construction, is from RBA (1991) Table 5.23, p. 236.

(d) data for public sector dwellings is from RBA (1991) Table 5.23, p. 236.

(e) Australian investment abroad is from RBA (1991) Table 1.20b, p. 43.

(f) non-official external debt is derived from RBA (1991) Table 1.20a, p. 42 by subtracting equities from non-official foreign investment in Australia.

(g) official gross external debt is defined as the difference between total and non-official foreign investment in Australia and is from RBA (1991) Table 1.20a, p. 42.

(h) foreign equity (total corporate equities plus net equities in branches) is from RBA (1991) Table 1.20a, p. 42.

(i) all data extracted from RBA (1991) was originally published by ABS.
### National Balance Sheet (ii) at 30 June (Billions of $A, deflated market prices)

<table>
<thead>
<tr>
<th></th>
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<tr>
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<td>Gross External Debt:</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Non-official</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Official</td>
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</tr>
<tr>
<td>Private Sector:</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Capital Stock</td>
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<td>432.59</td>
<td>15.72</td>
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<td>Dwellings</td>
<td>329.28</td>
<td>546.66</td>
<td>8.61</td>
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<td>544.84</td>
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<td>Foreign Equity:</td>
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<td>Foreign Investment in Australia</td>
<td>58.22</td>
<td>171.85</td>
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<td>Australian Investment Abroad:</td>
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<tr>
<td>Non-Official</td>
<td>9.96</td>
<td>45.35</td>
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<tr>
<td>Official</td>
<td>9.82</td>
<td>17.29</td>
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<td></td>
<td>19.78</td>
<td>62.64</td>
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<tr>
<td>Total Assets</td>
<td>747.07</td>
<td>1278.53</td>
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</table>

### National Balance Sheet (iii) as at 30 June (Billions of $A, market prices)

<table>
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<td>Gross External Debt:</td>
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<td></td>
<td></td>
<td></td>
<td>Non-official</td>
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<td></td>
<td></td>
<td></td>
<td>Official</td>
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<td>Private Sector:</td>
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<tr>
<td>Capital Stock</td>
<td>147.66</td>
<td>635.04</td>
<td>10.77</td>
<td>125.96</td>
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<tr>
<td>Dwellings</td>
<td>225.56</td>
<td>802.49</td>
<td>5.90</td>
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<td>Consumer Durables</td>
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<td>405.34</td>
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<td>Foreign Equity</td>
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<td></td>
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<td>Foreign Investment in Australia</td>
<td>39.88</td>
<td>252.27</td>
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<td>Australian Investment Abroad:</td>
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<tr>
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<td>66.57</td>
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<tr>
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<td></td>
<td>13.55</td>
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<td></td>
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<td>Total Assets</td>
<td>543.86</td>
<td>1962.56</td>
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National Balance Sheet (iv) at 30 June (Billions of $A, deflated market prices)

<table>
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<tr>
<th></th>
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<td>591.73</td>
<td>1037.62</td>
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<td>33.90</td>
<td>61.46</td>
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<td>Official</td>
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<td>17.29</td>
<td></td>
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<tr>
<td></td>
<td>19.78</td>
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<tr>
<td>Total Assets</td>
<td>793.95</td>
<td>1336.91</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6.3 National Assets and Claims on Assets ($b, 1984–85 prices)

Assets

| Year | Private Sector | | | | | | Public Sector | | | | |
|------|----------------|---|---|---|---|---|---|----------------|---|---|---|---|
|      | Capital Dwellings | Consumer Durables | Total | Capital Dwellings | Total | Aust Invest Abroad | Total |
| 1980 | 215.56 | 329.28 | 46.89 | 591.74 | 174.76 | 7.68 | 182.44 | 19.78 | 793.96 |
| 1981 | 235.82 | 360.64 | 47.79 | 644.26 | 183.99 | 8.11 | 192.10 | 18.85 | 855.21 |
| 1982 | 206.16 | 357.76 | 49.33 | 613.25 | 194.48 | 8.39 | 202.87 | 20.12 | 836.25 |
| 1983 | 227.87 | 346.30 | 49.75 | 623.91 | 197.65 | 8.48 | 206.13 | 24.83 | 854.87 |
| 1984 | 240.26 | 363.61 | 49.91 | 653.77 | 201.14 | 9.07 | 210.21 | 27.68 | 891.66 |
| 1985 | 249.98 | 381.50 | 51.06 | 682.53 | 206.83 | 9.90 | 216.73 | 32.78 | 932.04 |
| 1986 | 317.08 | 376.69 | 54.27 | 748.04 | 212.67 | 10.64 | 223.31 | 38.89 | 1010.23 |
| 1987 | 364.95 | 370.69 | 56.66 | 792.30 | 214.98 | 11.12 | 226.10 | 51.35 | 1069.74 |
| 1988 | 384.51 | 454.37 | 57.51 | 896.40 | 217.14 | 12.18 | 229.32 | 56.04 | 1181.76 |
| 1989 | 416.32 | 555.20 | 57.62 | 1029.14 | 219.21 | 13.76 | 232.97 | 60.69 | 1322.79 |
| 1990 | 432.59 | 546.66 | 58.37 | 1037.61 | 222.00 | 16.65 | 236.65 | 62.64 | 1336.9 |

Claims on Assets

<table>
<thead>
<tr>
<th>Year</th>
<th>Non official Gross External Debt</th>
<th>Official Gross External Debt</th>
<th>Foreign Equity</th>
<th>Total Foreign Invest in Aust</th>
<th>Residents Net Worth</th>
<th>Total</th>
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<td>15.71</td>
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<td>33.90</td>
<td>58.22</td>
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<td>793.96</td>
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<td>1981</td>
<td>18.14</td>
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<td>37.66</td>
<td>62.64</td>
<td>792.57</td>
<td>855.21</td>
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<td>27.54</td>
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<td>32.16</td>
<td>67.11</td>
<td>769.14</td>
<td>836.25</td>
</tr>
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<td>1983</td>
<td>35.50</td>
<td>8.96</td>
<td>33.74</td>
<td>78.21</td>
<td>776.66</td>
<td>854.87</td>
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<tr>
<td>1984</td>
<td>41.89</td>
<td>9.56</td>
<td>33.39</td>
<td>84.84</td>
<td>806.82</td>
<td>891.66</td>
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<td>1985</td>
<td>57.14</td>
<td>14.76</td>
<td>36.18</td>
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<td>823.96</td>
<td>932.04</td>
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<td>1986</td>
<td>67.54</td>
<td>21.34</td>
<td>36.40</td>
<td>125.28</td>
<td>884.95</td>
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<td>1987</td>
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<td>24.97</td>
<td>53.07</td>
<td>146.66</td>
<td>923.09</td>
<td>1069.74</td>
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<td>1988</td>
<td>73.31</td>
<td>25.50</td>
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<td>151.20</td>
<td>1030.56</td>
<td>1181.76</td>
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<td>1989</td>
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<td>165.57</td>
<td>1157.23</td>
<td>1322.79</td>
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<td>1990</td>
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<td>61.46</td>
<td>171.85</td>
<td>1165.05</td>
<td>1336.9</td>
</tr>
</tbody>
</table>
6.3.2 Estimating Net Worth Gains

The deflated market value of all tangible assets grew by 68 percent over the 1980's, with most of this increase coming from a very strong rise in the value of private sector assets, particularly private sector capital. Business capital comprised 45 percent of total private sector capital in 1990, growing 100 percent over the 1980's, compared to a 66 percent growth in the value of private dwellings.

Consumer durables, a relatively minor part of total assets, actually fell as a proportion of total tangible assets, from 6 percent of the total in 1980 to 4 percent in 1990. Notwithstanding a 30 percent rise in the public capital stock over the decade, the value of real assets created by governments and public trading enterprises also fell as a proportion of total assets (from 23 to 10 percent). Australian investment abroad, though starting from a low base in 1980, had more than trebled in constant price terms by decade's close, but was nonetheless (at 5 percent) still a relatively insignificant component of total tangible assets in 1990.

On the external liabilities side of the balance sheet, there was, as discussed at some length in earlier chapters, strong growth in gross external debt, which rose from $24.3b to $110.4b in constant price dollars. The ratio of gross foreign debt to total (potentially) saleable assets is a more appropriate measure of international economic exposure than the oft-quoted gross external debt to GDP ratio of some 40 odd percent. Indeed, the foreign debt to income ratio makes little economic sense, of itself, because it expresses a stock as a proportion of a flow, and hence does not compare like with like. Expressed in relation to total assets, gross external debt was only around 8 percent in 1990, which is relatively low in a gearing sense. Total foreign claims in the form of both debt and equity amounted to 13 percent of total assets in 1990, up from 7 percent in 1980.
The most significant feature of the balance sheets is that strong growth in the value of total assets easily offset the sharp increase in foreign claims on real assets domiciled in Australia, as manifested in a $429b increase in the real value of national net worth over the period." Chart 6.1a depicts the rise in deflated asset values, (without consumer durables) and net worth throughout the 1980's, whereas Chart 6.1b shows the behaviour of the augmented measure of assets, (ie. with consumer durables) and net worth.

The vertical distance in Charts 6.1a and 6.1b between total asset and net worth values at any date is the value of gross external liabilities. The stock changes in the main asset and claim items of national balance sheets (ii) and (iv) are graphically illustrated in Charts 6.2a and 6.2b.

These charts clearly put the growth in external liabilities in proper perspective, making it obvious that the rise in the value of private sector assets dwarfed rises in gross external debt and foreign equity claims on real tangible assets domiciled in Australia. Indeed, for every constant dollar increase in external claims on domestic assets which occurred through the flow process of foreign investment between 1980 and 1990, net worth, inclusive of consumer durables, increased by a multiple of 3.78 ie.

\[
\frac{\text{Deflated Net Worth}_{1990} - \text{Deflated Net Worth}_{1980}}{\text{Deflated External Claims}_{1990} - \text{Deflated External Claims}_{1980}} = 3.78
\]

The stock change increase in the deflated market price value of the private capital stock alone (i.e. non–dwelling construction, equipment and inventories) was 2.5 times the increase in the gross external indebtedness of both the private and public sectors.

** See Postscript 2 on p. 261A.
Chart (a)

Gross External Liabilities

Net Worth Gain

Chart (b)

Gross External Liabilities

Net Worth Gain

year

CHART 6.1  TOTAL ASSETS, EXTERNAL LIABILITIES AND NATIONAL NET WORTH
Chart 6.2a: Stock Changes in Assets and Claims on Assets
CHART 6.2a  STOCK CHANGES IN ASSETS AND CLAIMS ON ASSETS
CHART 6.2b  STOCK CHANGES IN ASSETS AND CLAIMS ON ASSETS

ASSETS ($B 1984-85 PRICES)

YEAR

1980

1990
CLAIMS ON ASSETS ($B 1984-85 PRICES)

CHART 6.2b (cont) STOCK CHANGES IN ASSETS AND CLAIMS ON ASSETS
Ultimately, as with the national income measures presented earlier in this chapter, it is useful to express changes in net worth in per capita terms to convey trends in economic welfare. Australia's average annual population growth in the 1980's was 1.5 percent, down slightly from the 1.6 percent annual average growth of the 1970's. Yet despite this continued population growth, net worth per head was still 36 percent higher in 1990 than in 1980, rising from $50,000 to $68,131 in 1984–85 dollars.

The pattern of the substantial growth in real per capita wealth throughout the decade is depicted in Chart 6.3, two features of which are worth highlighting. The first is that the overall rise in net worth per head tended to be concentrated in the second half of the 1980's when external debt was the primary macroeconomic policy issue. The second is that the two downturns in deflated net worth per head in 1982 and 1990 coincided with the onset of the most severe recessions of recent decades. Although the above discussion mainly addressed stock changes between end June 1980 and end June 1990, it is also worth noting that real wealth per capita actually peaked at end June 1989. Further, though not covered in this chapter, it would obviously be of interest to know how the large net worth gain of the 1980's was distributed. In other words, which income groups and industry sectors benefited most from the phenomenon of increased national gearing?
CHART 6.3  NET WORTH PER HEAD ($A, 1984-85 PRICES)
6.3.3 Accumulation, Capital Gains and Hicksian National Income

The above balance sheets may be used to identify the sources of growth in net worth between two dates. These sources of growth are primarily saving changes or valuation changes. Again, since we are mainly concerned with the performance of the open Australian economy in the 1980's, our focus will be on decomposing the net worth growth which occurred between 30 June 1980 and 30 June 1990.

Over this time, the value of Australia's net worth increased because new internationally saleable assets were accumulated and because capital gains outweighed losses on previously acquired real saleable assets. In what follows, the sources of growth in national net worth are revealed in an expression which includes an explicit role for foreign investment. This expression then enables empirical decomposition of the changes in national net worth as between accumulation and valuation effects. In deriving the expression, all stock and flow variables are presumed to be inflation adjusted and net of capital stock depreciation.

Starting with the assets side of the national balance sheet, we can relate the real value of total assets at an earlier date (h) to the value of total assets at a later date (j), as well as to other accumulation and valuation changes which occurred between these points in time. Hence,

$$K_j(t) + A_j(t) = K_h(t) + \int_h^j I(t)dt + \int_h^j D(t)dt + v(t) + [A_h(t) + \int_h^j I_A(t)dt + v(t)^*]$$

(6)

where $K_{h,j}(t)$ is the market value at dates $h,j$ of the tangible capital stock located domestically,

$A_{h,j}(t)$ is the market value at dates $h,j$ of the foreign assets of residents,

$I(t)$ is domestic investment net of consumption of fixed capital between $h$ and $j$. 


D(t) is domestic expenditure on consumer durables between h and j,

v(t) is capital gains on all domestic assets between h and j,

I_A^*(t) is foreign investment abroad between h and j, and

v'(t) is capital gains on foreign assets between dates h and j.

Now, the definition of net worth relating national assets and external liabilities is

\[ NW_{h,j}(t) = K_{h,j}(t) + A_{h,j}^*(t) - F_{h,j}(t) \]  

(7)

where NW(t) is net worth and F(t) is gross external liabilities (or gross foreign investment in the host country).

Substituting (7) into (6),

\[ NW'_j(t) + F'_j(t) = NW'_h(t) + F'_h(t) + \int_h^j I(t) \, dt + v(t) + \int_h^j D(t) \, dt + \int_h^j I_A^*(t) \, dt + v'(t) \]  

(8)

Therefore, the stock change in the value of net worth (dNW) between dates h and j is

\[ dNW(t) = NW'_j(t) - NW'_h(t) = F'_j(t) - F'_h(t) + \int_h^j I(t) \, dt + \int_h^j I_A^*(t) \, dt + \int_h^j D(t) \, dt + v(t) + v'(t) \]  

(9)

We may now re-introduce net foreign investment by recalling that, conceptually, NFI is the difference between gross capital inflow and gross capital outflow between two dates. Also, according to SNA convention, external account flows exclude all capital gains and losses on the face value of stock claims. Hence,

\[ \int_a^j [NFI(t)] \, dt = \int_a^j [I'_h(t)] \, dt - \int_a^j [I'_j(t)] \, dt = [F'_j(t) - F'_h(t) - z(t)] - [A'_j(t) - A'_h(t) - v'(t)] \]  

(10)
where $NFI(t)$ is net foreign investment

$I_h^*(t)$ is gross foreign capital inflow and

$z(t)$ is capital gains on domestic assets to which foreigners hold direct claims.

Using (10) to substitute for $I^*_h$ in (9), it follows algebraically that

$$dNW(t) = \frac{\int I(t) \, dt - \int D(t) \, dt - \int NFI(t) \, dt}{net\ accumulation} + \int v(t) + \nu^*(t) - z(t) \, dt$$

Equation (11) reveals the fundamental sources of increase in national net worth, between dates $h$ and $j$. National net worth rises because of greater accumulation, capital gains or both. If we revert to the narrow definition of national saving introduced in Chapter 2, as exclusive of spending on consumer durables, then the accumulation term shown above is simply equal to national saving between $h$ and $j$. This is because the integral of $NFI$ is also the difference between the integrals for investment and the conventional saving measure i.e. $\int NFI(t) \, dt = \int I(t) \, dt - \int S(t) \, dt$.

To gauge the extent to which upward revisions in the market price valuations of property and private capital contributed to changes in net worth in Australia through the 1980's, we can rearrange equation (11) as

$$k = dNW(t) - \int I(t) \, dt - \int D(t) \, dt + \int NFI(t) \, dt$$

where $k$ summarizes the net revaluation of assets, or capital gains, between $h$ and $j$. 
Having already estimated an annual series for real net worth, annual values for $k$ can be determined, as a residual, by subtracting inflation-adjusted values for domestic investment (net of depreciation), consumer durables and NFI. ABS provides real annual domestic investment data, Treasury (1991) provides an inflation-adjusted consumer durables series and the inflation-adjusted CAB series, derived in Chapter 2, again provides an approximation for real NFI. The decomposition of the annual change in net worth as between accumulation and capital gains or losses is shown in Table 6.4.

Table 6.4 Accumulation, Capital Gains and Net Worth Changes (Inflation Adjusted) $b

<table>
<thead>
<tr>
<th></th>
<th>dNW(a)</th>
<th>I_p(b)</th>
<th>dD(c)</th>
<th>NFI(d)</th>
<th>Accumulation(e)</th>
<th>k(f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980–81</td>
<td>56.83</td>
<td>19.60</td>
<td>0.90</td>
<td>5.25</td>
<td>15.25</td>
<td>41.58</td>
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<td>1981–82</td>
<td>-23.43</td>
<td>23.05</td>
<td>1.54</td>
<td>6.68</td>
<td>17.91</td>
<td>-41.34</td>
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<td>7.52</td>
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<td>10.38</td>
<td>-2.86</td>
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<td>14.69</td>
<td>0.16</td>
<td>4.70</td>
<td>10.15</td>
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<td>1984–85</td>
<td>17.14</td>
<td>18.81</td>
<td>1.15</td>
<td>7.41</td>
<td>12.54</td>
<td>4.60</td>
</tr>
<tr>
<td>1985–86</td>
<td>60.99</td>
<td>20.55</td>
<td>3.21</td>
<td>5.20</td>
<td>18.51</td>
<td>42.58</td>
</tr>
<tr>
<td>1986–87</td>
<td>38.14</td>
<td>16.69</td>
<td>2.39</td>
<td>0.54</td>
<td>18.52</td>
<td>19.62</td>
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<tr>
<td>1987–88</td>
<td>107.47</td>
<td>19.64</td>
<td>0.85</td>
<td>1.93</td>
<td>18.56</td>
<td>88.91</td>
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<td>1988–89</td>
<td>126.67</td>
<td>28.71</td>
<td>0.11</td>
<td>11.96</td>
<td>16.86</td>
<td>109.81</td>
</tr>
<tr>
<td>1989–90</td>
<td>7.82</td>
<td>27.06</td>
<td>0.75</td>
<td>14.60</td>
<td>13.21</td>
<td>-5.39</td>
</tr>
</tbody>
</table>

Notes:

(a) annual change in deflated net worth
(b) real private and public investment, including inventory changes, net of depreciation; source RBA (1991) Table 5.19, p. 228
(c) annual change in real stock of consumer durables; source Treasury (1991) p. 2
(d) NFI approximated by real CAB series (see Table 2.2)
(e) annual real accumulation derived as (b)+(c)-(d)
(f) capital gains derived as (a)-(e).
This decomposition of net worth gains makes evident that valuation changes were easily the major source of variation in national net worth during the 1980's and had a particularly marked effect in the late 1980's. Nonetheless, real capital accumulation also contributed and was quite buoyant in the second half of the decade.

The earlier Charts 6.1a and 6.1b suggest that ordinary consumption, fully financed by foreign borrowing, could have been substantially higher in the 1980's to the extent of the shaded area without worsening the nation's net worth position between the beginning and end of the decade. In the late 1980's in particular, the charts reveal that gross external liabilities could have more than doubled to finance extraordinary consumption, which would have unambiguously improved economic welfare, and that this would have left the nation no worse off in real net worth terms than at the beginning of the 1980's.

The econometrically based estimates of the macroeconomic income gains from foreign investment, which were presented earlier in this chapter, treated national income in the conventional manner, as prescribed by the SNA. However, national income can be measured another way. According to Hicks (1946) income is "...the maximum value a person can consume during a given period and still expect to be as well off at the end of the period as at the beginning". By extension, national income could alternatively be defined as the maximum attainable consumption by a nation's residents in a given period, which leaves the aggregate real value of future consumption possibilities, as reflected in national net worth, the same at the end of the period as at the outset.

This alternative Hicksian concept of national income can actually be measured using the information provided in the national balance sheets and Table 6.4. To approximate Hicksian national income ($Y^h$) in a given year, we simply add realized aggregate consumption to potential additional consumption, as represented by the change
in national net worth i.e. $Y^h = dNW + C$. See Table 6.5. The net worth measure used here, to avoid double counting, is the narrower measure, which excludes spending on consumer durables.

In the table below, conventional national disposable income is compared with estimates of Hicksian national income which have been derived along the lines suggested above. The alternative series are contrasted in Table 6.5 and Chart 6.4. Interestingly, this chart reveals that Hicksian national income persistently exceeded the standard income measure throughout the 1980's, except in the recession affected years, 1982–83 and 1989–90. Conventional national income averaged $180.0b in 1984–85 prices over the decade, whereas Hicksian income averaged a significantly higher $212.9b. The Hicksian estimates are evidently more variable than the conventional measures however, largely reflecting sharp movements in the market price values of private sector assets.

Table 6.5 Conventional vs Hicksian National Income ($b, 1984–85 prices)

<table>
<thead>
<tr>
<th>Year</th>
<th>National Disposable Income</th>
<th>$C_p$</th>
<th>$C_g$</th>
<th>$C$</th>
<th>dNW</th>
<th>Hicksian National Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980–81</td>
<td>160.8</td>
<td>114.3</td>
<td>35.0</td>
<td>149.3</td>
<td>55.9</td>
<td>205.2</td>
</tr>
<tr>
<td>1981–82</td>
<td>163.3</td>
<td>119.0</td>
<td>35.3</td>
<td>154.3</td>
<td>–21.9</td>
<td>132.4</td>
</tr>
<tr>
<td>1982–83</td>
<td>158.4</td>
<td>120.3</td>
<td>36.3</td>
<td>156.6</td>
<td>7.1</td>
<td>163.7</td>
</tr>
<tr>
<td>1983–84</td>
<td>167.5</td>
<td>123.4</td>
<td>38.0</td>
<td>161.4</td>
<td>30.0</td>
<td>191.4</td>
</tr>
<tr>
<td>1984–85</td>
<td>175.4</td>
<td>127.9</td>
<td>40.2</td>
<td>168.1</td>
<td>15.99</td>
<td>184.1</td>
</tr>
<tr>
<td>1985–86</td>
<td>179.7</td>
<td>132.4</td>
<td>42.1</td>
<td>174.5</td>
<td>57.78</td>
<td>232.3</td>
</tr>
<tr>
<td>1986–87</td>
<td>182.9</td>
<td>133.5</td>
<td>43.1</td>
<td>176.6</td>
<td>35.75</td>
<td>212.4</td>
</tr>
<tr>
<td>1987–88</td>
<td>194.1</td>
<td>138.9</td>
<td>44.2</td>
<td>183.1</td>
<td>106.62</td>
<td>289.7</td>
</tr>
<tr>
<td>1988–89</td>
<td>206.7</td>
<td>144.3</td>
<td>44.8</td>
<td>189.1</td>
<td>126.56</td>
<td>315.7</td>
</tr>
<tr>
<td>1989–90</td>
<td>210.9</td>
<td>150.4</td>
<td>45.4</td>
<td>195.8</td>
<td>7.07</td>
<td>202.9</td>
</tr>
</tbody>
</table>
CHART 6.4  ALTERNATIVE NATIONAL INCOME MEASURES
6.4 Conclusion

Popular and official discussion of Australia's external flow magnitudes in the 1980's centred on the CAD and neglected that the matching KAS allowed real investment, and hence national output growth, to be higher than otherwise, as estimated in this chapter.

Estimations of national income gains were performed in two ways. First, a macroeconometric production function for Australia was estimated which enabled a comparison of the difference between the marginal productivity and cost of foreign capital. Second, actual estimated national income was compared to simulated national output and national income without a foreign-financed capital stock. Both methods revealed there were significant national income gains attributable to the foreign capital accumulated throughout the 1980's.

Similarly, the focus on the rise in external debt failed to acknowledge that increased national gearing following intensified capital market integration facilitated rising asset values and hence enabled national net worth to be significantly higher than otherwise.

As a stock measure, national net worth is conceptually equivalent to the wealth of the nation, estimated in practice by constructing national balance sheets with all assets and claims on assets, where possible, included at market prices. Clearly, as a production unit, the nation geared up throughout the 1980's. Because asset value growth far exceeded the rise in external liabilities, the higher leverage was, however, favourable. The balance sheets were also used to identify the sources of growth in wealth as between accumulation and valuation changes in the 1980's, as well as to derive new Hicksian measures of national income.
Based on misperceptions about the consequences of the external imbalance, a range of prescriptions were proposed in the policy debate as ways of "improving" Australia's external position. These prescriptions, along with many of the misperceptions about Australia's external accounts, are critically evaluated in the final chapter.

Postscripts

1. One examiner of this thesis suggested that these estimates might be compared to other macroeconometric estimates of the return on capital to establish their reasonableness. In particular, the Murphy–Access model which estimates a macroeconometric production function using a CES specification could also be used to derive alternative estimates of the return on Australia's capital. Some key features of the Murphy model have already been discussed earlier in Chapter 5 in the context of evaluating econometric approaches to quantifying the effects of fiscal imbalances on Australia's CAD.

The Murphy–Access model obtains CES parameters using data for the period 1976–1992. It estimates an actual rate of return which in principle is the same as the marginal product of capital under the assumption of constant returns to scale. The average value of this estimate for the period 1976 to 1992 was around 11 per cent.

The differences between the estimates in this thesis and those implied by the Murphy–Access model are due to a number of factors. For instance, the alternative CES specification in the Murphy–Access model, as well as the actual data used obviously matters. Both the labour data and capital stock series were quite different. Whereas the estimation of this thesis was based on labour input measured as hours worked, the Murphy–Access model used persons in the labour force.

The capital stock data used in this thesis was as published by the ABS, whereas Murphy–Access uses a more partial capital stock measure which excludes government capital. It makes other adjustments to the ABS capital stock series as well, for instance to exclude the land component from the ABS series.

It should also be emphasized that the estimates of marginal product in this thesis are unambiguously estimates of the gross, not net, marginal product. After subtracting an estimated capital depreciation rate of, say, 8 percent, these returns do not seem unusually high. On the other hand, the Murphy–Access capital stock series mixes net capital stock data with gross investment flows, suggesting some ambiguity about whether the derived marginal productivity estimates actually reflect gross values or values net of depreciation.
Furthermore, the estimated Cobb–Douglas production function above generated estimates of capital and labour elasticities which sum to 1.07, suggesting slightly increasing returns to scale. On the other hand, had constant returns to scale been strictly imposed in the estimation, by making the capital and labour elasticities equal one, then the derived estimates may well have been a little lower.

2. Examiners of this thesis also drew attention to the balance sheet analysis by Whitelaw and Howe (1992: p 2), presented in a single table (Table 2) of their paper. It should be noted, however, that sections 6.3.1 and 6.3.2 of this thesis was actually written well before publication of the Whitelaw–Howe paper. In contrast to what is contained in this Chapter, the Whitelaw–Howe balance sheet exercise was quite rudimentary. Their paper included only a single balance sheet, with national assets restricted to four broad categories (Domestic Business, Domestic Other, Australian Equity Investment Overseas and Foreign Lending (Gross)). Liabilities were simply limited to two categories (Foreign Equity Investment and Foreign Debt). Furthermore it is noteworthy that Whitelaw and Howe were rather dismissive of the balance sheet notion, notwithstanding their results which are mentioned in Postscript 3.

Relatedly, one examiner of this thesis also commented that many would assert that asset values were unrealistically high near the end of the 1980's and that subsequent asset–price deflation, as reflected in falling equity and property values, has created unnecessary economic distress and also contributed to the recent recession. A full set of data covering all asset categories recorded in Table 6.3 is not yet available for the early 1990's. Yet partial indicators, such as sharemarket indices and real–estate values, suggest that market prices for the bulk of national assets, though sluggish, have not actually fallen below 1990 levels, notwithstanding evidence of some localised falls in commercial–property values. Moreover, it should be pointed out in this context (as earlier made clear in Chapter 2) that the aim of the empirical component of this thesis was to consider in depth the behaviour of the Australian economy in the 1970's and 1980's. Strictly speaking, the behaviour of macroeconomic variables beyond this period lay outside the scope of this work.

3. This result can be compared with the later estimates of national net worth changes derived by Whitelaw and Howe, who presented their current price balance sheet estimates as percentages, in terms of nominal GDP. Whereas, they subsequently showed that national net worth rose as a percentage of GDP from 423 per cent to 426 per cent, the estimates from National Balance Sheet (i) on p 239 show that national net worth rose from 384 per cent to 436 per cent between the earlier years 1980 and 1990. In other words, both sets of estimates confirm the strength of the rise in national wealth over much the same time period.
7.1 Introduction

As highlighted in Chapter 1, Australia's external accounts, particularly from the mid-1980's were widely interpreted in negative terms. Imports were popularly considered to have been too high relative to exports, gross national expenditure too high relative to gross national product, domestic saving too low relative to investment and foreign debt too high relative to GDP. These views were based on the different ways of presenting the external imbalance in international macroeconomic accounting terms as set out in Chapter 2.

The most comprehensive assembly of the chimeras that dominated public thinking and the policy response to Australia's external imbalance in the 1980's is found in the official report of the Joint Parliamentary Committee on Foreign Affairs, Defence and Trade, entitled *Australia's Current Account Deficit and Overseas Debt* (1991). This report was based on evidence presented in 72 written submissions from academics, the Reserve Bank of Australia, the Treasury, other government departments and industry groups.

The Parliamentary Report concluded that the trade deficit, the saving-investment imbalance and external debt were serious problems and in its first recommendation affirmed that external balance should be an explicit goal of economic policy, along with full employment, low inflation and improved living standards. A key theme of the Report
was that both goods and financial markets had somehow failed to respond appropriately to Australia's external imbalance and that this alleged failure justified direct policy action. The arguments for public policy initiatives advocated by the Committee, such as positive assistance to value-adding export and import-replacement industries, measures to alter saving and investment behaviour, and the use of macroeconomic instruments to lower the exchange rate and real interest rates, reflected two key, yet somewhat unrealistic, assumptions.

The first was that policymakers possessed more knowledge than private markets and the second that policymakers behaved according to a well defined social-welfare function and placed the public interest above self-interest. However, it seems implausible, particularly in relation to industry policy, that officials can know more about unexploited profit opportunities for particular industries than individual firms operating in the industries. The very survival of private firms, unlike that of government agencies, depends on seeking out these opportunities. As for the second assumption, it seems unlikely that any lasting agreement about the public interest could ever be reached among government ministers and their departments.

Like much of the popular discussion on the external accounts, the Parliamentary Report did not adequately explain why the CAD and the external debt increased in the 1980's, although it certainly had much to say about how to reduce them. (See also EPAC (1986, 1988b, 1990c, 1991, 1992).

In what follows, various policy "solutions" to Australia's external imbalance, as proposed by the Parliamentary Committee and others, are firstly addressed, with reference to the content of earlier chapters. The chapter then concludes by highlighting the main points of the thesis.
7.2 **Misplaced Responses to CAD**

From the misplaced assumption that Australia had a trade and current account problem, it was often concluded, by viewing the external imbalance from a trade balance perspective, (see also Australian Manufacturing Council (1990), for instance) that exports were suboptimal and that the CAD itself was symptomatic of a lack of trade competitiveness. This prompted calls for increased budgetary assistance for exporters and also provided the rationale for the Federal Government's microeconomic reform (or supply side) program. (See Industry Commission (1990) for full details).

To analyse the macroeconomic impact of widespread industry intervention and microeconomic reform on net exports, it is necessary to reconsider the role of changes in the real exchange rate, or competitiveness using the dependent economy model outlined in Chapter 3. Gregory (1976) and Corden and Neary (1982) also used the dependent economy framework to analyse the dynamic effects of a booming mineral sector. As seen earlier, it is necessary to abstract from capital flows in order to isolate the influence of changes in competitiveness on the trade account in a general equilibrium framework. Then, with a floating exchange rate, exports automatically equal imports as an equilibrium condition in the foreign exchange market.

From the earlier Figure 3.1 it is possible to derive demand and supply schedules for tradables, as shown in Figure 7.1. In the tradable sector, output is an increasing function of competitiveness, whereas total expenditure or absorption of tradables is a decreasing function. The downward sloping schedule is a compensated demand curve, drawn for a given level of gross national expenditure. The upward sloping supply schedule is drawn for a given level of output. Point E corresponds to equilibrium in Figure 3.1.
7.2.1 Industry Assistance

The intellectual basis for the proposals to assist industries in the tradable sector in order to raise net exports and eliminate the CAD derives from the recent literature on strategic trade policy (See Spencer and Brander (1983), Brander and Spencer (1985) and Krugman (1987)). Strategic trade policy has been criticised in the Australian context on microeconomic grounds (See Industry Commission (1989) and Bates (1990)). However, the case against widespread industry assistance did not specifically address the key issues of how effective such a policy strategy may be in 'improving' the trade balance and hence the external imbalance.

Consider the effect of public assistance aimed at boosting the production of tradables, for example by means of direct subsidies paid from the Federal budget or perhaps concessional tax treatment for tradable industries with potential to increase
exports. Under the assumptions of fully flexible prices in all markets, the absence of capital flows must ensure \( Y - E = 0 \) (see the earlier Figure 3.1 of Chapter 3) and hence \( X - M = 0 \) as an equilibrium condition. Implicitly, this also assumes full employment and hence abstracts from macroeconomic policy interventions.

If public assistance measures raised tradable production, Figure 7.1 predicts the following transitory effects on exports, imports and the trade balance between equilibrium positions. The analysis serves to highlight the importance of competitiveness and the behaviour of the exchange rate in restoring external equilibrium following policy shocks explicitly directed at the goods markets, per se. For a given level of national output, the industry policy induced increase in the supply of tradables causes a trade surplus of \( AC \). However, the attendant excess supply of foreign exchange immediately appreciates the currency, worsening competitiveness. The appreciation must, however, eventually crowd out production of more traditional tradables to the extent of distance \( BC \). At the same time, the appreciation stimulates demand for tradables, thereby raising imports. The fall in competitiveness due to a nominal exchange rate appreciation is also compounded by a rise in the price of non-tradables which comes about as resources are shifted toward production of tradables. In equilibrium, the trade account is again balanced with the initial increase in production \( AC \) fully matched by displacement of earlier exportable production \( BC \) and a rise in demand for importables \( AB \). In short, industry interventionism to raise the production of tradables at the expense of non-tradables ultimately proves futile as a means of affecting the trade balance.

The above analysis shows that it is immaterial whether selective tax concessions or production subsidies be provided to existing exportable industries in the primary sectors or to existing importable manufacturing industries engaged in higher value-added production.
Either way, the boost to total tradable output would not create a lasting trade surplus. Indeed, neither would the alternative of providing subsidies for ex post export performance which was how the now defunct Export Expansion Grants Scheme, administered by the Federal Department of Trade in the early 1980's operated. If subsidies are paid for past export achievement, the incentive must exist for firms to divert sales of their product from domestic to foreign markets. However, if households and firms maintain domestic expenditure on the good in question at the previously desired level, this suggests imports would rise equivalently, having no net effect on the trade account. In much the same way, 'Buy Australian' campaigns which seek to influence absorption instead of output only tend to switch domestic demand for tradables from foreign to domestic suppliers, leaving the overall trade balance unaffected.

7.2.2 Microeconomic Reform

Concern about the trade deficit component of the current account during the 1980's not only prompted calls for widespread assistance for tradable industries, but was also responsible for the inclusion of microeconomic reform within the Federal Government's policy armoury. It was argued that microeconomic reform by boosting productivity through more efficient practice could raise national output and hence reduce the output–expenditure imbalance.

The microeconomic reform agenda included initiatives to eliminate restrictive labour practices, improve efficiency in water transport, rail services, grain handling, aviation, post and telecommunications, electricity pricing and contracting of government services, to name the most publicised. According to the Industry Commission (1989, 1990), the substantial reforms made at both Commonwealth and State levels since the late
1980's could contribute an additional $22 billion a year (in 1988–89 dollars), to national output over the longer term, an amount in excess of annual nominal values of the external imbalance in the late 1980's.

The proposition that microeconomic reform aimed at increasing overall productivity in the economy was an ineffective means of restoring external balance can also be demonstrated by extending the dependent economy approach. The key difference compared with the static macroeconomic modelling of interventionism is that we now have a dynamic economy whose production possibilities are being augmented. In the dependent economy framework, microeconomic reform translates to an outward shift of the production possibility frontier of Figure 3.1. As output and exports rise, the nominal exchange rate appreciates inducing a rise in imports. The higher income flowing from the higher output levels also induces increased spending on both tradables and non–tradables. See Figure 7.2. As with interventionism, the floating exchange rate renders microeconomic reform ineffective to influence the trade balance.

The above analysis re-invoked the dependent economy model of Chapter 3 for the purpose of examining goods market disturbances and isolating the role of competitiveness in the trade balance adjustment process. However, as emphasized repeatedly earlier, to understand the determination of the external imbalance under conditions of capital mobility, it is necessary to recognize that a zero external balance does not suggest optimality.
Forsyth (1990a, 1990b) also challenged the view that microeconomic reform would, of itself, narrow the current account deficit. From a saving–investment perspective, Forsyth argues that only to the extent that reforms of any kind alter saving or investment behaviour will the current account imbalance be affected. Indeed, it is conceivable that some reforms could further widen the deficit if, for given saving, the reforms increase available investment opportunities throughout the economy. Such an argument is fully consistent with the earlier theoretical approaches of Chapter 4 which highlighted the independence of saving and investment decisions under conditions where capital is mobile.
7.2.3 The Pattern of Trade

From the premise that Australia developed a serious trade and external account problem in the 1980's, the Federal Parliamentary Committee, the Australian Manufacturing Council and others concluded that not only should Australia export more, but that the composition of exports should somehow be altered by making unprocessed commodity exports relatively less important as a component of total exports of goods and services.

In relative terms, Australia has an abundance of productive land and natural resources relative to working population. These resources are extracted, harvested, or, in the case of visiting foreign tourists, observed for pleasure. In contrast, the economies of many of its trading partners, such as Japan, have an abundance of labour relative to natural exploitable resources. Those countries find it advantageous to employ the relatively abundant factor in adding value to imported primary products through manufacturing activity. So relatively natural resource-intensive economies such as Australia and relatively labour-intensive ones like Japan are complementary to one another.

Traditional trade theory stresses the mutual benefits conferred on nations when they exchange, through international trade, commodities that each can produce at least cost. As David Hume (1963:336) pointed out in the 18th century, 'Nature, by giving a diversity of geniuses, climates and soils, to different nations, has secured their mutual intercourse and commerce, as long as they all remain industrious and civilized'. David Ricardo (1817) and many modern international trade theorists later transformed this idea into the well-known theory of comparative advantage. In his famous example, Ricardo argued that both England and Portugal could raise their national incomes through the increased trade made possible if England specialised more in cloth production and Portugal specialised more in
making wine. Proposals to increase public assistance to encourage more value-added exports effectively turned this Ricardian prescription on its head: as if England really would have been better off with more vineyards and Portugal with more cotton mills.

To reveal the structure of Australia's production and how the pattern of its international trade in goods and services accords with its relatively large natural resource endowment, it is illuminating to trichotomize economic activity according to whether it is exportable, importable or non-tradable. This can be done using the most recent input-output tables which also form part of the Australian National Accounts. See Makin (1992c).

In line with the theoretical analysis outlined in Appendix 7.1, an exportable industry is classified as one whose domestic production exceeds expenditure; an importable industry as one where domestic expenditure exceeds production; and a non-tradable industry as one without potential to be affected significantly by international trade.

Australia's exportables are mainly primary and lightly processed agricultural and mineral commodities, its importables are manufactures, and its non-tradables are largely services. Net exports of a small group of commodities (viz. cereal grains, metal ores, coal, minerals and meat) in fact account for over three quarters of total merchandise exports while much more highly processed goods (machines, textiles, chemicals, processed food products and other manufactures) account for about four fifths of total imports.

There is nothing to suggest that Australia's production and trade pattern, or more particularly, the revealed lack of diversity within exportables is suboptimal, as advocated in the policy debate. After all, the principle of comparative advantage implies high, not low, trade specialisation for small economies. Indeed, if industry policies did go some
way toward homogenising the pattern of Australia's trade, making its exportables appear more like its importables, then to the extent that this moved Australia out of areas of activity where it enjoys relative cost advantages, such as in natural resource based industries, its long term growth could suffer. In general, it is necessary to establish that externalities exist before intervening to affect trade patterns.

7.3 **Saving, Investment and Policy**

Apart from the above discussed concerns about the trade deficit and the composition of exports, there was widespread disquiet about Australia's saving and investment behaviour in the 1980's, as also conveyed in the report of the Parliamentary Committee. Indeed, common fallacies about the nation's saving and investment performance, some of which have also been addressed by Pitchford (1990), apparently influenced the stance of monetary and fiscal policy, particularly in the late 1980's.

7.3.1 **Fallacies About Savings and Investment**

The absorption equation, which expresses the external imbalance as the excess of expenditure over output, provided a basis for the common assertion of the 1980's that Australia was "living beyond its means". This phrase implied that, as for a household, consumption could not be sustained beyond income. Yet, as demonstrated in earlier chapters, the pure absorption equation has no explicit intertemporal dimension. Since it fails to distinguish between consumption and investment expenditure, it can therefore be misleading. Almost by definition, Australia was not consuming beyond its means in the 1980's, because it generated significant positive saving, as discussed at length in Chapters 2 and 5.
Despite our stylized fact that private saving did not fall over the 1970's and 1980's, it was argued (by Moore (1990) for example) that any rise in consumption financed by increased NFI should be cause for concern, as it would not generate future income to service the increased foreign liabilities. However, what this argument neglects is that any fall in saving can only be reflected in the CAD if foreigners are also willing to finance an equivalent amount of domestic investment. The earlier Figure 5.1 made this point obvious. See Harper (1990) for related discussion.

In other words, if foreigners' propensity to finance investment in Australia remains unchanged, yet domestic saving falls, then NFI should fall to the extent of the fall in domestic saving. It was not often understood that foreign lenders were always making judgements about whether the increased domestic activity they financed had the potential to create sufficient revenue to allow for eventual repayment of their capital. Moreover, as depicted earlier in Chart 5.1, Australia's saving performance was not unusual by international standards, which is not to say there were absolutely no microeconomic factors making the level of saving less than optimal.

At a more fundamental level, however, private saving in the aggregate should have revealed individuals' intertemporal choices about consumption, as proposed by the Fisherian approach of Chapter 4. Accordingly, a "low" saving rate then simply reveals one economy's preference for current consumption relative to another economy's whose higher saving rate reveals its stronger preference for future consumption. It follows that if Australia's saving rate in the 1980's was such that insufficient national saving was available to finance domestic investment opportunities, then this should not have been of concern to policymakers if non-residents were willing to bridge the gap with their saving.
Indeed, as proposed in earlier chapters, such a process confers macroeconomic welfare gains on both debtor and creditor economies.

In the policy debate about Australia's saving–investment imbalance, questions were raised about the nature of investment activities that foreign funds financed, specifically whether foreign capital was directed toward expanding tradable or non–tradable activities. Notwithstanding some of the difficulties which arise in trying to classify activities as between tradable and non–tradable, a number of points can be made against the proposition that the kind of investment financed matters in any case. First, some non–tradable activities (for example, business services) are probably best thought of as complementary to tradable activities, so that foreign investment in such areas may well ultimately improve the overall competitiveness of tradable industries. Second, foreign funds may directly finance the creation of new tangible assets which would not otherwise be created, as for example with the construction of buildings, and the creation of those assets may simply be motivated by the prospect of a capital gain on the sale of the asset to other foreigners, with no undesirable economic consequences for Australia.

Indeed, foreign investment in the form of purchases of existing property puts upward pressure on all property values. In this way, foreign investment in property in the 1980's would have contributed to asset price inflation and hence the higher national net worth outcomes which were quantified in Chapter 6. Those residents who sold existing property assets to foreigners obtained capital gains which would not otherwise have occurred, though of course these capital gains were excluded from conventional measures of national income. Third, in any event around forty percent of the foreign debt was actually denominated in Australian dollars by the end of the 1980's, as we saw in
Chapter 2. Hence, it was unnecessary to eventually generate foreign exchange for the extra activity that part of foreign debt financed.

Fourth, as argued by Pitchford (1990), external debt should not, of itself, be considered a macroeconomic problem, unless sources of market failure can be identified which led to levels in excess of those normally incurred in the process of financing private investment.

Somewhat curiously, the widespread perception that Australia had an external debt problem was driven by the availability of perhaps the most comprehensive and timely measures of international indebtedness of any nation. One therefore wonders whether the problem would have loomed so large as a policy issue if the ABS had not provided as much information.

The absolute value of the external debt created anxiety because it was interpreted as a sign that the nation was somehow on the verge of international insolvency. The national balance sheets of Chapter 6 of course showed otherwise. Moreover, comparisons with Latin American indebtedness abounded, despite the relatively small share of sovereign or official debt within Australia's total debt and despite the absence of any explicit official underwriting of private sector debt as often occurs in other debtor countries with less sophisticated capital markets. Australia's external debt should have been distinguished clearly from that of Latin American countries because official international financial institutions had not been involved directly. Furthermore, borrowings did not directly finance public consumption which is often a major reason for IMF's concerns about other nations' external debt.
Of course, it may then be argued that the monetary authorities provide implicit guarantees to large external debtors and would assume a significant share of external liabilities in the event of widespread servicing difficulties. However, it remains a matter of conjecture as to whether, and to what extent, such guarantees would be applied, even in extreme circumstances, such as a severe depression.

7.3.2 Monetary and Fiscal Policy

A fundamental inconsistency in macroeconomic policy in the 1980's arose because it was not recognised that continuing capital inflow and rising CADs were being jointly determined. Financial deregulation facilitated greater foreign investment in Australia, yet the external imbalance which was a manifestation of this inflow became the main target of macroeconomic policy.

Why was this? If it was because the overall level of economic activity became too buoyant, and inflation was too high, then the problem was excess aggregate demand, not excess foreign debt. However, what was not explained was why the higher investment that fuelled the increased economic activity levels in the late 1980's was so worrisome. Moreover, as suggested in Chapter 5, any tightening of monetary policy over this period could, to some extent, have perversely raised the external imbalance because it contracted the supply of loanable funds available for given domestic investment demand. As regards inflation as a goal of monetary policy it is noteworthy that as conventionally measured, domestic inflation and external imbalances are not really independent targets. From Chapter 2, it follows that lower domestic inflation automatically lowers measured CAD's, other things equal.
If the monetary authorities thought business enterprises became too careless about offshore borrowing the most direct policy response would have been the reimposition of exchange controls prohibiting such activity. But of course, the reduction of capital inflow would, other things equal, have immediately put downward pressure on the exchange rate and, more generally, have lessened the Reserve Bank's capacity to influence competitiveness through the interest rate channel. In any case, such a re-regulatory policy would not have been advisable in view of the efficiency arguments originally proposed to support financial deregulation.

The salient feature of Australia's external indebtedness was that most of it was incurred by private enterprises operating in Australia, irrespective of whether they were owned and controlled by residents or non-residents. Hence it should have been taken for granted that private firms committed to servicing their overseas borrowings also rationally assessed ex ante whether the income stream generated through the use of foreign capital would have been sufficient to meet repayments. To suppose otherwise was tantamount to questioning whether private firms generally acted to maximise profit. In this regard, to say external indebtedness was in some way a national problem meant enterprises which borrowed offshore were mostly mistaken.

At the microeconomic level, as long as firms operating in Australia contracted loans with offshore lenders and paid lower interest (inclusive of exchange rate effects) than the return on additional productive investment, then the economy's growth rate was higher. If they did not, losses were made, and at the macroeconomic level, investment fell reducing the external imbalance. In short, NFI, irrespective of its form (debt or equity participation), in net terms enabled Australia to finance that much more investment which,
for given domestic saving, enlarged the capital stock and allowed more output to be produced, as quantified in Chapter 6.

Obviously there were instances where domestic firms 'over-borrowed' offshore or, what amounted to the same thing, cases where foreigners unwisely invested their funds in Australia. Moreover, there were grounds for doubting whether all of the public business enterprises which borrowed heavily offshore after deregulation used foreign loans prudently. At a fundamental level, problems encountered for such firms arose because the future profitability of the enterprises was uncertain at the time loan contracts were struck. What was important however were not the isolated, yet usually well-publicised, cases of private and public companies in financial difficulty but whether public and private firms with external liabilities, in the aggregate, were profitable in the sense that the real return on foreign capital exceeded its servicing cost.

To have been less than sanguine about firms' ability to achieve such a result in truth revealed misgivings about the nature of capitalism itself. An essentially Keynesian view of the world therefore applied to the extent that the Federal Government assumed a highly activist role in stabilising the economy because goods, services and financial markets were judged to have failed to ensure macroeconomic stability.

Though it is normally assumed that the business sector's domestic financial liabilities are used productively, the authorities implicitly assumed otherwise about its external liabilities. Yet domestic lenders lend against a firm's collateral and foreign lenders in principle act no differently. In extreme cases where firms found they were too overgeared to service debt, the liquidator was called in to wind them up. By and large, it was immaterial under such circumstances whether troubled firms' liabilities were to residents or to foreigners. Assets were sold and part of the external debt disappeared.
The debt/income ratio of a family on average earnings and with an average housing mortgage easily exceeded Australia's external debt/income ratio throughout the 1980's. Yet neither households, bankers nor officials were concerned about the burden of householders' debt or indeed about the possible insolvency of the household sector as a whole. So why was the much smaller external debt/national income ratio considered so important? Indeed, the significance attached by financial markets and the authorities to the existing external debt/income ratio and the frequent questioning about whether it would stabilise seemed quite arbitrary. Foreign debt angst was really akin to worrying about housing mortgages and forgetting that mortgages allowed more people to live in affordable houses of their choice.

One possible side effect of the greater external borrowing by Australian firms in the 1980's which should be acknowledged as a caveat to earlier arguments was that larger foreign loan raising by more adventurous firms could have raised the interest rate risk premium charged to all other borrowers. Arndt (1989) emphasized this particular factor, which he viewed as an "externality", in arguing that Australia's external debt was a severe public policy problem, while Juttner and Luedecke (1991) provided supporting econometric evidence of a risk premium. Relatedly, Corden (1991) stressed this "contamination" effect in his thorough search for qualifications to the so-called "new view" of the external accounts, which suggested that CAD's did not matter.

As the official view in the 1980's was that Australia had a severe external account problem, it was not surprising that in fact the international creditrating agencies, Moody's and Standard and Poor's, came to believe it as well. The downgrading of Australia's creditworthiness from the highest AAA to the lower AA rating in 1986 seemed a natural response to the alarm about the external debt so actively generated in Australia.
Nonetheless, other OECD countries, for different reasons, also experienced similar downgradings during the 1980's. Lower creditworthiness, and higher risk premia may well have raised foreign interest rates on offer to Australian borrowers. Nonetheless, even if a risk premium was included in foreign rates on offer, it was logically inconsistent for those worried about the escalation of the debt, also to be concerned that lower creditworthiness made it harder to borrow offshore.

The most fundamental reason for the persistence of Australia's external account imbalance in the 1980's was that domestic private savings fell short of domestic investment opportunities as perceived by residents and non-residents alike. While this may suggest public policy initiatives of a microeconomic nature to encourage greater domestic saving, attempts to change saving behaviour permanently may well have been frustrated, since consuming less out of disposable income would have immediately lowered living standards for most Australian households. Saving more today could result in less income being transferred to foreigners tomorrow but households are unlikely to judge such a sacrifice worthwhile. Moreover, such a sacrifice would be unjustified since the output gain from the use of foreign saving outweighed its servicing cost.

To the extent that households did not behave as predicted by the Ricardian Equivalence proposition and raise private saving to offset the average fall in saving in the 1980's over the 1970's, it could be argued that an appropriate fiscal policy response to the external imbalance would have been to raise Federal budget surpluses even higher in the late 1980's. However, as Corden (1991) notes, the macroeconomic policy issue then becomes not whether the external imbalance per se is excessive, but whether the budget imbalance is appropriate, in and of itself.
More generally, Pitchford (1990) was responsible for widespread questioning of the tight macroeconomic policy response to the higher current account deficit and external debt by promoting the "new view" that fiscal and monetary policy should essentially be directed toward lowering unemployment and inflation.

7.4 Conclusion

Australia's external account imbalance and external debt were policy concerns apparently because they grew so quickly during the mid-1980's after financial deregulation. Yet, as we have seen, real investment and national net worth also grew faster in Australia over the same period, in part because the thoroughgoing internationalisation of Australia's financial markets greatly improved access to foreign saving.

Throughout the 1980's in Australia, the official approach to the external accounts bore a striking resemblance to the old mercantilist doctrine, first debunked by David Hume, the key features of which were that governments should regulate their way toward trade surpluses (these being perceived as the source of national wealth), and that international trade was as a zero-sum game. The popularity of mercantilism also provided Adam Smith, the original classical economist, with a motive for writing his *The Wealth of Nations* (1776), a major theme of which was that international trade, or more generally free economic exchange, conferred net gains on the parties to the exchange. Though few economists would disagree with this insight, Australia's policymakers apparently missed this point, particularly as it related to international financial transactions.

This thesis has shown that a proper analysis of the determination of the external accounts under current conditions of highly mobile financial capital should acknowledge
the gains from international trade in saving and that foreign investment has important real macroeconomic implications. It benefits some countries to lend excess saving to others and thereby run CAS's, at the same time as it benefits others with excess investment opportunities to borrow foreign saving and run CAD's. Foreign investment or capital account surpluses can indeed be beneficial, in a macroeconomic sense, for foreign funds help a nation expand its stock of productive capital. Focusing only on the corresponding trade and current account deficit and the cost of foreign capital in the external accounts is misleading and inevitably unpropitious.

In developing this argument, an extended national accounting framework was introduced which allowed Australia's sectoral balances to be presented systematically in inflation-adjusted terms. Mainstay theoretical models of the open economy were then critically surveyed and judged unsatisfactory as vehicles for explaining international capital transfer and external account determination. Alternatively, more meaningful capital-theoretic models of the external accounts linking saving, domestic investment and foreign investment were adapted to demonstrate the macroeconomic gains from international capital mobility and foreign investment.

In the 1980's, greater capital mobility resulted from the increased global integration of international capital markets in the wake of worldwide financial liberalisation. This facilitated higher investment levels in Australia which, combined with the pattern of saving, manifested in the larger capital account surplus.

Using the insights of the capital-theoretic approaches to external account determination, macroeconometric modelling and estimation showed there were significant national income gains resulting from the increased foreign investment of the 1980's. New
balance sheet measures also revealed that Australia's net worth or wealth position improved substantially over this time, notwithstanding the sharp rise in external debt.

All in all, the theory and evidence presented in this thesis would appear to justify the increased foreign investment in Australia in the 1980's.
Appendix 7.1

Exportables, Importables and Non-tradables

Consider first the distinction between exportables and importables. At the industry level, whether a particular product is an exportable or importable depends amongst other things on that industry's comparative cost structure, and total domestic expenditure on the good. Firms supply a tradable good or service, while households, other firms or the public sector absorb it. If output is produced beyond that required to satisfy domestic demand, it is exportable, and importable if insufficient is produced.

In the diagram presented in Figure A.7.1, the world price (P*) of the good expressed in domestic currency is $P_w = eP'$ where $e$ is the exchange rate. At $P_w$ the industry produces the dotted area while the shaded area is the value of net imports in domestic currency and is the difference between total spending on the good (the two areas) and the industry's production. At price $P_w$, therefore, the good is an importable. The good may be tradable at $P_A$, but is not traded internationally at that price. With a rise in $P_w$ above $P_A$ it becomes exportable.

This of course implicitly assumes the "law of one price" which cannot be expected to hold up very well if a particular good is highly differentiated. Although arbitrage tends to equalise the prices of primary commodities, this does not generally happen with more elaborately transformed goods. See Isard (1977). Further, economies contributing little to world output may potentially influence world prices of products they specialise in, for example as with wool from Australia or coffee from Brazil. Though such examples violate the dependency criterion they are usually exceptional. In effect, dependency assumes countries accept world prices as given in much the same way as firms do in a Marshallian market.
Figure A.7.1 – Exportable vs. Importable Activity

For a dependent economy, 'IE' (or excess supply schedules) can be imagined for every internationally transferable good or service for which markets exist. What determines their slope is the responsiveness of both domestic output and expenditure to changes in the domestic currency price. A particular tradable industry's IE schedule would be flatter the more price elastic are both demand and supply and the higher these elasticities, the greater the industry's contribution to net exports following a rise in the world price of the good. On the other hand, non-tradables are generally insensitive to movements in corresponding prices of similar goods and services determined in other economies. For any strictly non-tradable category of national product, the IE, schedule
would lie along the price axis. Hence, given world prices, comparative costs and demand preferences, a dependent economy's output at any point in time is partly exportable, partly importable with the rest non-tradable.

At the macroeconomic or total industry level the value of the total domestic output of exportables, importables and non-tradables, or GDP, less domestic absorption is the nation's trade imbalance. In symbols,

\[(\sum \Sigma P_x O_x + \Sigma P_m O_m + \Sigma P_n O_n) - (\sum \Sigma P_x A_x + \Sigma P_m A_m + \Sigma P_n O_n) = \Sigma P_x X - \Sigma P_m M\]

where \(P_{x,m,n}\) are prices of individual exportables, importables and non-tradables,

\(O_{x,m,n}\) the production of exportable, importable and non-tradable industries,

\(A_{x,m,n}\) is absorption,

\(X\) is the volume of exports and

\(M\) is the volume of imports.

Under a floating exchange rate and in the absence of capital flows the exchange rate itself will always move to ensure that the value of exports equals the value of imports. However, once capital flows are introduced, this condition no longer holds. Persistent trade or current account imbalances are then best understood as national investment-saving imbalances as discussed.


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