



# **INTERNATIONAL CAPITAL MOVEMENTS FROM AN AUSTRALIAN PERSPECTIVE**

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This paper reflects the view of the author, and does not necessarily represent the policies of the Reserve Bank of Australia, or the opinion of my colleagues at the Bank.

## **Abstract**

There has been recent interest in the role of capital flows in the process of exchange rate determination given the apparent breakdown of traditional relationships between fundamentals and currencies. This is true of the United States, Euro area and Japan, but also Australia. In this paper we do not attempt to settle the debate as to whether there is a theoretical justification for including capital flows in the analysis of exchange rate movements, nor do we attempt to find a role for capital flows in explaining the recent trends observed in the currency. Rather, the attempt here is to highlight that simplistic analysis of capital flows is unlikely to be helpful in furthering our understanding of exchange rates. While the balance of payments data may not be without information content, the complexity of the economic relationships reflected in the data needs to be appreciated. Some of these complexities are laid out in this paper. Some questions are answered, new questions are raised, and some loose threads are tied together.\*

Keywords: capital flows, exchange rate, current account, balance of payments

\* I would like to acknowledge the research assistance of Peggy To. The paper benefited from helpful comments provided by Craig Callum, Jonathan Milligan, and Bob Rankin, although remaining errors are not attributable to them.

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# **INTERNATIONAL CAPITAL MOVEMENTS FROM AN AUSTRALIAN PERSPECTIVE**

## **1. Introduction**

The Australian capital account, and indeed financial markets more generally, have been open and essentially deregulated for some time now. Implicit in this is that the composition of capital movements to and from Australia is not a major policy concern in its own right. That is not to say that the flows are not monitored or that prudential regulations do not have a role to play.<sup>1</sup>

The most recent interest in capital flows stems from puzzles that have arisen in terms of exchange rate determination. Over recent years traditional models based on fundamental determinants of the Australian dollar and other major exchange rates have tended to break down. While in the very long term exchange rate fundamentals are still expected to reassert themselves by way of the purchasing power parity doctrine or the Balassa-Samuelson augmentation thereof, in recent years there appears to have been a more prolonged than usual period of deviation between exchange rate outcomes and fundamentals. Many analysts have consequently sought medium term answers in capital movements on the premise that the large increase in international gross flows that have resulted from increased global financial integration can at least in part explain shorter-term exchange rate fluctuations.

The purpose of this paper is therefore to explore some of the issues related to capital flows as recorded in the balance of payments. The paper makes no attempt to weigh into the debate about whether or not capital flows are important in a causal sense to exchange rate determination. Rather it is descriptive of the observed flows and raises some of the issues and facts that are often misinterpreted when capital flows are discussed in the Australian context.

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<sup>1</sup> Micro-level exceptions include the Foreign Investment Review Board, financial sanctions imposed against individuals and entities in line with the recommendations of the United Nations, and anti money laundering procedures administered by the Australian Transaction Reports and Analysis Centre (AUSTRAC).

The remainder of the paper is organised in the following way. The next section briefly reviews the balance of payments identity and cautions against the commonly held misconception that Australia has suffered from capital outflows in recent years that have resulted in exchange rate depreciation. Section 3 provides a brief breakdown of the capital account and describes recent flows. Section 4 considers hedging practices of firms and how this may mask the exchange rate impact of the various components of capital flows. Section 5 looks at the statistical evidence for drawing distinctions between hot and cold, or short- and long-term flows. Section 6 considers a number of further potential limitations to our use of capital flows data. The final section offers some concluding comments and assessments.

## 2. Capital flows and the balance of payments

We start this section by reiterating some very simple but too often forgotten basic principles, which when ignored lead to a compounding of errors and misinterpretation.

The balance of payments identity is such that the sum of the current account, capital account, and changes in reserve assets must be equal to zero.

$$BOP \equiv C + K + \Delta R \equiv 0$$

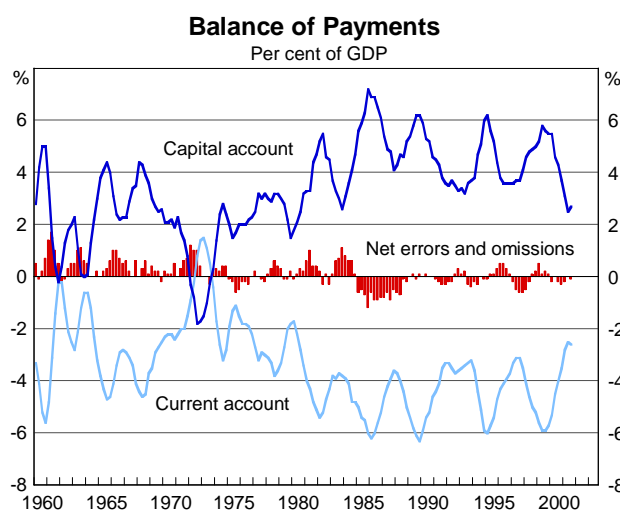
Where BOP is the balance of payments, C is the current account, K is the capital account, and R represents reserve assets.<sup>2</sup>

The double-entry accounting system adopted in the published balance of payments statistics reflects this constraint, with the sum of credits and debits set equal to zero. Estimation errors and omissions, usually attributed to the problems associated with measuring items in the capital account, ensure that this constraint is

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<sup>2</sup> Note that while there is typically a textbook distinction made between the capital account and changes in reserve assets, the balance of payments records reserve assets as part of the capital account (as depicted in the graph shown). Throughout we refer to capital flows as being recorded in the capital account. In practice they are recorded in what is termed the financial account.

met in every period.<sup>3</sup> It is therefore not surprising to find that movements in the capital account mirror the current account.<sup>4</sup>



Furthermore, since the current account has been in deficit since the early 1970s capital has been continuously flowing into Australia to fund this shortfall in domestic saving over investment.

There is usually some confusion about this simple fact when capital flows are discussed in the context of exchange rate determination. The graph clearly shows that over the past 30 years capital has been flowing into Australia. Yet commentators often cite capital *outflows* as causing exchange rate depreciation. With net capital inflows in recent experience, a shortfall of capital inflow *per se* cannot be the cause of depreciation. Also note that, the above discussion clearly lays out that calls for more capital inflow to support the currency have a direct symmetry – they are equivalent to running an argument that higher current account deficits lead to exchange rate appreciation. While the argument is identical, few would actually seriously propose it.<sup>5</sup> Insofar as capital movements are thought to

<sup>3</sup> Refer also to section 6.5 on revisions and estimation errors below.

<sup>4</sup> Since Australia's exchange rate regime is best described as being an independent float without an unannounced target path for the exchange rate, changes in reserves average to be close to zero over time, the implication being that the current account is largely offset by non-reserve asset capital movements.

<sup>5</sup> For those not familiar with Australia's external position, persistent current account deficits have often been cited as a major policy concern. Concern about the sustainability of ongoing large current account deficits has led to sharp depreciations in the currency in the past, although there is some evidence of structural improvement over recent years.

be causal in exchange rate determination, capital inflow of its own therefore does not imply ongoing exchange rate appreciation. Instead, proponents of this view must seek answers in the composition of flows that make up the capital account.

The question that concerns us most is therefore how the composition of capital flows may relate to exchange rate determination, and why one type of capital flow is more important than another. It would appear that a dollar is not a dollar when it comes to capital movements.

### **3. Composition of capital flows**

The flow of capital between countries takes two main forms: equity and debt. Equity flows may be of a portfolio nature or in the form of direct investment.<sup>6</sup> Debt flows are usually of a portfolio nature, or reflect money market flows largely associated with the short-term financing needs of the banking sector.

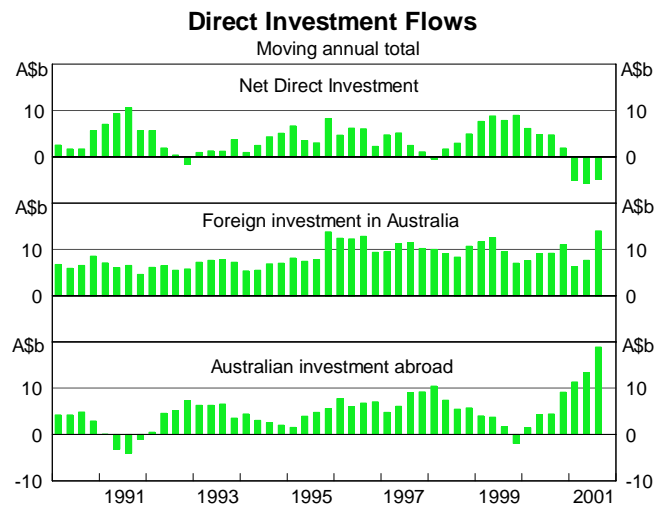
The transactions that give rise to these different types of capital flows are described in the following sections. Since the accompanying graphs of the associated net and gross flows are self explanatory and easy to interpret, the descriptions are kept brief.

#### **3.1 Foreign direct investment**

Foreign direct investment in Australia has been solid over the past 10 years. While there have been some fluctuations in the inflows, they have averaged in excess of \$5 billion per annum over the past decade, and on the latest data available were running at around \$15 billion per year. The variability in the net flows is therefore almost entirely attributable to Australian direct investment abroad. The sharp step up in Australian acquisitions of foreign firms since the start of 2000 has resulted in net direct capital outflows over the course of 2001.

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<sup>6</sup> Direct investment is usually distinguished from portfolio equity investment by the size of the stake taken in a foreign company. A stake greater than 10 per cent is deemed to invest some degree of control and constitutes direct investment. Anything less than that is deemed to be a portfolio allocation decision.



While the determinants of foreign direct investment are difficult to isolate, note that claims that domestic firms are bought when they are cheap in foreign currency terms (that is, when the Australian dollar is low) are difficult to justify on the basis of these data.

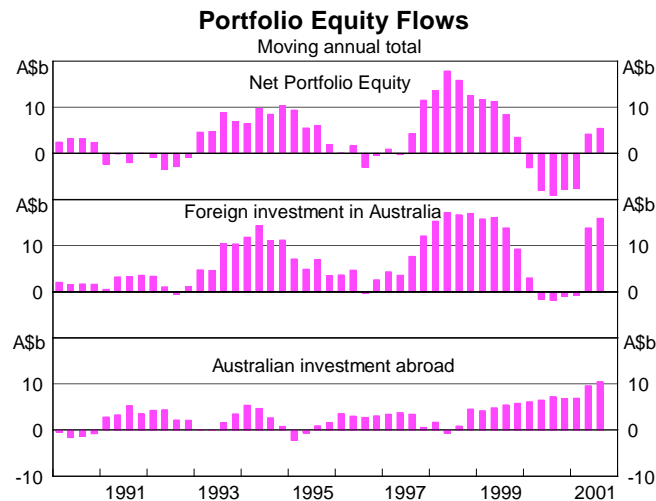
## 3.2 Portfolio investment

As mentioned above, portfolio allocation decisions normally take the form of equity or fixed income investments. Since the driving forces between these two types of flows are likely to be quite different we distinguish between portfolio equity and portfolio bond flows.

### 3.2.1 *Portfolio equity investment*

Foreign flows into Australian equities began to slow in 1999. At around this time the popularity of technology stocks led to a boom in overseas indices such as the NASDAQ in the United States. Australian equity markets had less weight to technology stocks. Through 1999 the flows into domestic equities continued to dwindle before turning into outflows over much of 2000. At the same time, Australian investment in foreign equities continued to grow. The net inflows thus dried up over 1999 and turned to become sharp outflows over the following year. However, the most recent data available indicate that domestic equities are once again attracting inflows from abroad.



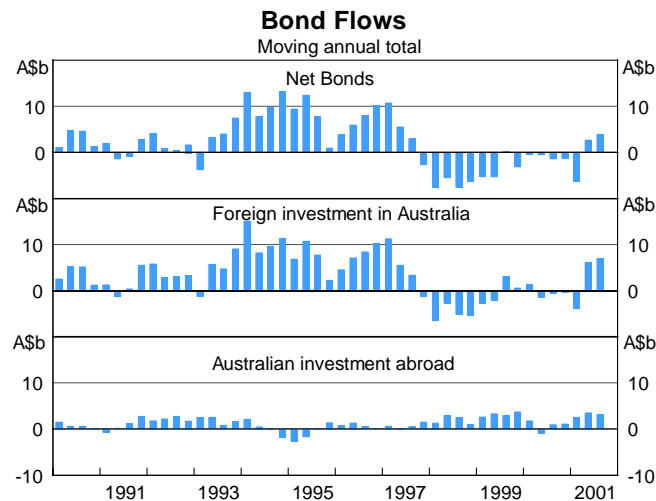


Interestingly, it has been these equity flows that have attracted the most attention from commentators. Since the flows described above roughly corresponded to the observed exchange rate trends over the period, many seemed convinced that equity flows were a major driver. While this may have been the case, the arguments always neglected to satisfactorily explain why a dollar associated with equity flows should be more important than a dollar associated with the more than offsetting inflows. We will return to some of these questions in a later section.

### 3.2.2 *Portfolio debt investment*

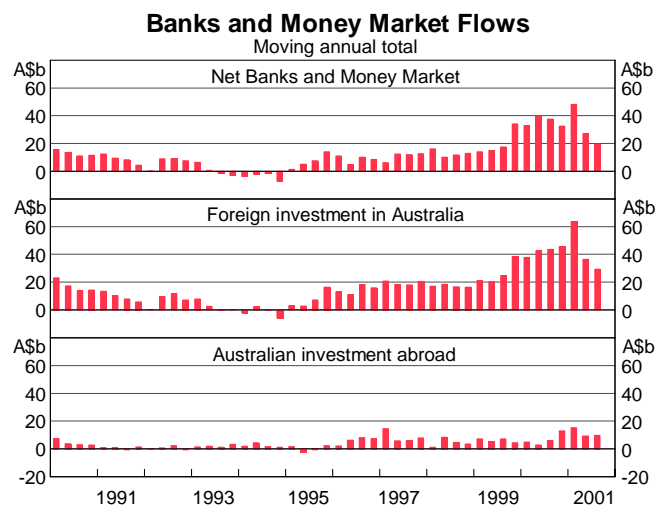
The movements in bond flows are somewhat difficult to describe since the worldwide reduction in public indebtedness has raised supply issues that are difficult to disentangle from the demand factors at work. The effect on inbound investment opportunities resulting from the emerging shortage of government bonds is difficult to gauge and crosses the boundaries into the debate on fiscal policy, which is somewhat beyond the scope of this paper.

It is clear, however, that while investment abroad has been relatively slow and steady, foreign inbound investment fluctuates widely, slowing to zero in 1997, turning to outflows for several years, only to steady for a period before rebounding sharply in the most recently available data.



### 3.3 Money market (and other) investment

At around the time when net equity and bond flows could have been considered as weighing on the exchange rate, the residual of the capital account, associated mainly with international bank financing and money market flows, was strongly positive.<sup>7</sup> In fact, the net inflows recorded under this item of the capital account more than offset the reported outflows elsewhere. This is not surprising since we know that the current account was in deficit and section 2 reminded us of the balance of payments identity.



<sup>7</sup> Also note that while this item is effectively calculated as a residual, it excludes official reserve assets.

The most obvious discernible trend is the sharp acceleration in foreign investment in Australia mainly associated with domestic banks raising short-term debt in overseas markets to fund their domestic lending operations.<sup>8</sup> The rise corresponds with the domestic increase in household indebtedness in the absence of corresponding deposits with the banking sector. In effect this is a reflection of the infinitely elastic supply of credit available under a deregulated banking system where credit is always available at a price. Banks may choose to raise offshore debt to tap into more liquid markets or to take advantage of favourable interest rate spreads.

On balance then, we observe some capital outflows at the same time as we observe some capital inflows and note that these can correspond with either exchange rate appreciation or depreciation.

#### **4. Hedging of foreign exchange exposures**

A complication to disentangling the possible exchange rate impact of the measured capital flows is the widespread use of hedging by firms to limit their exposure to foreign currency risk. For example, obligations to make payments in a foreign currency at a future date can be insulated from the associated risk of adverse exchange rate movements if an entity enters a contract to acquire an offsetting foreign currency asset. While the actual practice of hedging foreign currency exposures is far more complicated, and normally involves the use of sophisticated derivatives products, the basic principle remains the same.

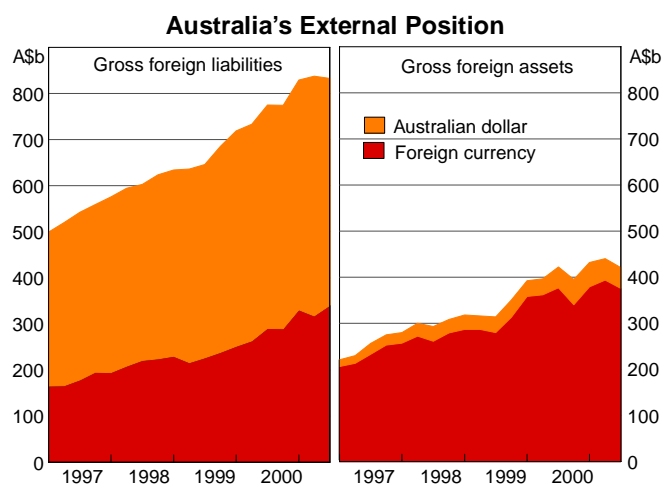
The impact of an underlying capital flow is obviously going to be affected by the degree to which it is hedged. If it is fully hedged it should have no impact. Importantly, if there are systematic differences in the degree of hedging for different types of flows, it may be that some types of capital flow do have different potential impacts than others.

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<sup>8</sup> See also Reserve Bank of Australia (2000).

## 4.1 Evidence from a recent survey

The Australian economy is insulated from the impact of adverse exchange rate movements on the value of foreign liabilities in two ways. Firstly, a large proportion of outstanding claims foreigners have on domestic assets, are denominated in Australian dollars and therefore not subject to exchange rate fluctuations. In effect, the exchange rate risk of these claims has been fully assumed by agents abroad.



Secondly, much of the remaining liabilities that are denominated in foreign currencies are more than fully hedged, meaning that as a whole the Australian economy is long foreign currency.<sup>9</sup>

Equity positions held by domestic entities abroad typically remain largely unhedged, with around 12 per cent of positions intended to be hedged on average. This would seem to indicate that to the extent that actual flows from abroad into domestic equities in the form of direct or portfolio investment can be accurately observed, they probably result in commensurate flows through the foreign exchange market that give rise to demand for and supply of Australian dollars.

On the other hand, net foreign debt positions held by Australian entities are almost fully hedged, with a reported intention to hedge around 77 per cent of the exposure back into Australian dollars. The certainty associated with the payments and receipts arising from foreign currency debt means that this type of exposure lends

<sup>9</sup> Refer also to Australian Bureau of Statistics (2002).

itself to hedging. Thus, the exchange rate impact of international debt flows is likely to be at least in part offset by hedging practices.

The banking sector provides a useful illustration.<sup>10</sup> As alluded to in section 3.3 above, the banking sector raises offshore debt to fund its domestic lending operations, thereby giving rise to substantial capital inflows. If we combine this evidence from the balance of payments with the stylised facts of hedging that we know about the banking sector, we can draw several broad conclusions.

The sector has foreign debt assets and liabilities that give rise to a net liability position on debt. The accumulation of this position is reflected in the capital inflows under this item in the balance of payments. We also know that a significant proportion of the foreign currency exposure that arises from this position is offset by foreign currency derivatives entered into by the banking sector to manage the associated exchange rate risk. This hedging is not reflected in the balance of payments statistics and is therefore not taken into account when looking at published capital flows data.

**Banking Sector's Foreign Currency Exposure\***  
**A\$ billion, as at 30 June 2001**

Net position on debt	-117
+ Foreign equity assets	31
+ Net position on foreign currency derivatives	109
<b>= Foreign Currency Exposure</b>	<b>23</b>

+/- long/short foreign currency

\* Amounts may not add due to rounding.

Source: ABS 5302.0

However, the exchange rate impact from an international debt flow that appears to be at least partially hedged therefore becomes very difficult to interpret. Not only does the practice of hedging offset at least some of the positive impact of the associated capital inflows, the type and duration of the hedge also assumes some importance. Unfortunately data constraints make it difficult to take hedging into

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<sup>10</sup> Refer also to Reserve Bank of Australia (2000) for a more detailed discussion on the foreign currency exposures of the Australian banking sector.

account when looking at capital flows, thereby limiting their application to questions about exchange rate determination.

## 5. Disaggregated capital flows and exchange rate correlations

It is often argued that volatile capital flows can contribute to exchange rate overshooting. It is also often asserted that some types of capital flows are typically more stable than others, the implication being that a greater proportion of the less volatile kind translates into less erratic exchange rate movements. The resulting terminology labels short-term flows into money markets as ‘hot money’ and longer-term flows as ‘cold money’. This is then only one step removed from the argument that foreign direct investment inflows are ‘good’ because they engender longer term connotations, while money market flows are ‘bad’ due to their flighty nature.<sup>11</sup>

For the Australian data we find that net direct investment is indeed relatively stable, but that short-term money market flows are in fact even more so.<sup>12</sup> Net portfolio debt is more volatile than portfolio equity flows. Notice also that the overall volatility in the capital account itself is considerably less than that of the individual components. The implication here is that some of the volatility observed in categories of flows net out to some extent. The labels of long- and short-term flows therefore do not appear to be very helpful in describing the persistence of flows.<sup>13</sup>

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<sup>11</sup> Refer to Claessens *et. al.* (1995) for a more in depth discussion and cross-country studies.

<sup>12</sup> To assess the degree of volatility we follow the literature in using the coefficient of variation (i.e. standard deviation divided by the mean). A particular type of capital flows that has the same standard deviation but a higher mean than another is therefore judged to be less volatile.

<sup>13</sup> These results are consistent with the findings of Lipsey (1999) that US foreign direct investment flows are more volatile than short-term flows over a sample from 1969 to 1993. Similarly, results published in Claessens *et. al.* (1995) confirm these findings for the United States.

### Volatility of Net Capital Flows

Sample: 1988:3 to 2001:3

	Mean (\$m)	Standard Deviation (\$m)	Coefficient of Variation
Direct investment	842.3	2111.9	2.5
Portfolio equity investment	799.1	2735.3	3.4
Portfolio debt investment	627.7	2768.7	4.4
Short-term debt investment	3054.0	5367.4	1.8
Capital account*	5323.1	3020.1	0.6

\* Excluding reserve assets, errors and omissions.

This finding is supported by negative correlation between short-term debt flows and other types of capital flows. This is consistent with the hypothesis that short-term debt flows respond to movements in other flows – and in effect represent residual financing. Of course, our work does not test for causality, but it does suggest that attempts to distinguish between ‘hot’ and ‘cold’ flows are further brought into question. Similarly, distinctions between ‘short-’ and ‘long-term’ flows would also become difficult to substantiate.<sup>14</sup>

### Cross-Correlation of Net Capital Flows

Sample: 1988:3 to 2001:3

	Exchange rate	Foreign direct	Portfolio equity	Portfolio debt	Money market	Capital account
Exchange rate	<b>1.00</b>					
Foreign direct	0.01	<b>1.00</b>				
Portfolio equity	0.12	0.29	<b>1.00</b>			
Portfolio debt	0.14	0.04	0.20	<b>1.00</b>		
Money market	-0.24	-0.37	-0.59	-0.68	<b>1.00</b>	
Capital account*	-0.19	0.34	0.24	-0.10	0.36	<b>1.00</b>

\* Excluding reserve assets, errors and omissions.

Note also from the table that while there is evidence of cross-correlations between the flows themselves, there is very little correlation between the flows and

<sup>14</sup> Claessens *et. al.*, (1995) find that the labels ‘short-term’ and ‘long-term’ do not provide any information about the time series properties of the flows given that long-term flows are often as volatile as short-term flows and that knowledge of the type of flow does not improve the ability to forecast the aggregate capital account.

exchange rate changes. Furthermore, the exchange rate tends to move in the opposite direction to the overall capital account.

While this section provides only a cursory description of the time series properties of the data, the apparent substitutability between the flows is worth bearing in mind.

## 6. Other data issues and limitations

The preceding sections alluded to some of the problems associated with interpretation of capital flows. In particular, it was highlighted that hedging behaviour, which is likely to be an important modifier of the effects of capital flows on markets, is not reflected in the published data. In this section, we discuss some remaining issues and limitations that should be addressed before using capital flows data in econometric work.

### 6.1 Relating the change in stocks to the flows

A change in the estimated stock of foreign assets or liabilities between periods is not necessarily always the result of an actual capital flow that could influence the exchange rate, even after hedging is taken into account.

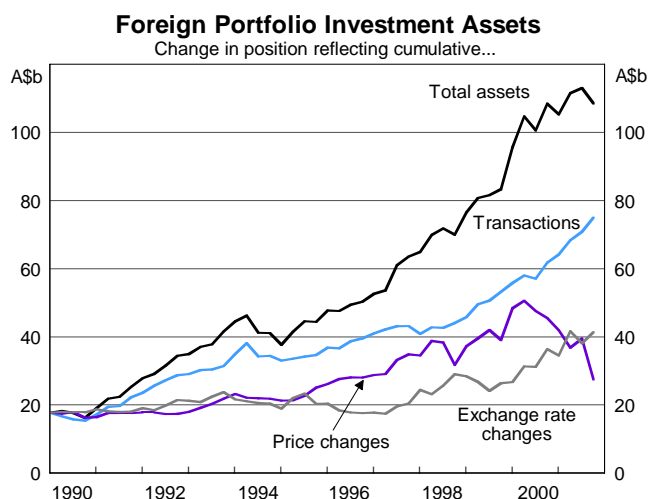
The change in the stock of foreign assets and liabilities can be broken down as arising from four separate sources. These are easily described in the following simple formula:

$$\Delta S = T + \underbrace{\Delta P + \Delta ER + \mu}_{\text{not actual flows}}$$

where  $S$  is the stock of foreign assets/liabilities and the change in that stock ( $\Delta S$ ) between the beginning and end of the period is described by the right hand side variables;  $T$  represents the transactions that take place during the period to add or subtract from the existing stock;  $\Delta P$  is the change in the price of assets associated with the outstanding stock (i.e. valuation effects); similarly, but due to a quite separate source, the domestic currency value of the outstanding stock may change due to changes in the exchange rate ( $\Delta ER$ ); finally, there may be a number of other



sources of change ( $\mu$ ). These data are published in the official statistics, and can be easily extracted.



Consider the total stock of foreign portfolio assets outstanding and how it has changed between the beginning of 1990 and the latest available data point at the end of the September quarter of 2001. Over the period in question, portfolio assets rose by almost \$100 billion. The majority of this increase was due to the cumulative effect of transactions to acquire foreign portfolio assets. However, as the price of existing assets rose until 2000 and subsequently fell, there were also considerable valuation effects at work. Also note that the exchange rate depreciation from the start of 2000 in effect boosted the Australian dollar value of the existing stock of portfolio assets denominated in foreign currencies.

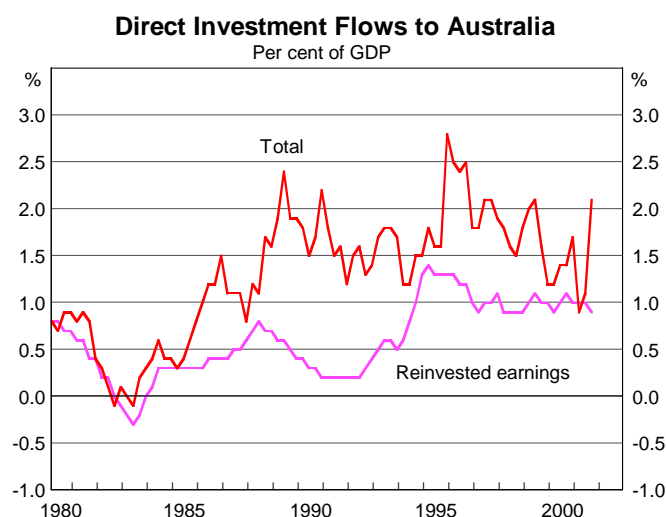
If we are concerned with capital flows in the context of exchange rate determination we are most interested in actual transactions that pass through the foreign exchange market. Changes due to valuation and exchange rate effects in themselves are unimportant and should be adjusted for. Indeed, the graphs used to describe recent flows in preceding sections focus on transactions data only. This important point is too often overlooked.

## 6.2 Imputed transactions

Even when care is taken to focus exclusively on the transactions data, problems remain. Some of the data reported as being part of transactions is not a physical

flow. Retained earnings for example are deemed to be a transaction, but are an imputed figure and do not involve the buying or selling of foreign exchange.

This is most pronounced when looking at the relationship between direct investment flows and the retained earnings component thereof.



Retained earnings are clearly a major component of direct investment flows to Australia, as shown above. However, a stream of retained earnings cannot have a direct exchange rate impact and should ideally be excluded when examining exchange rate determination.

### 6.3 Residency of transacting entities

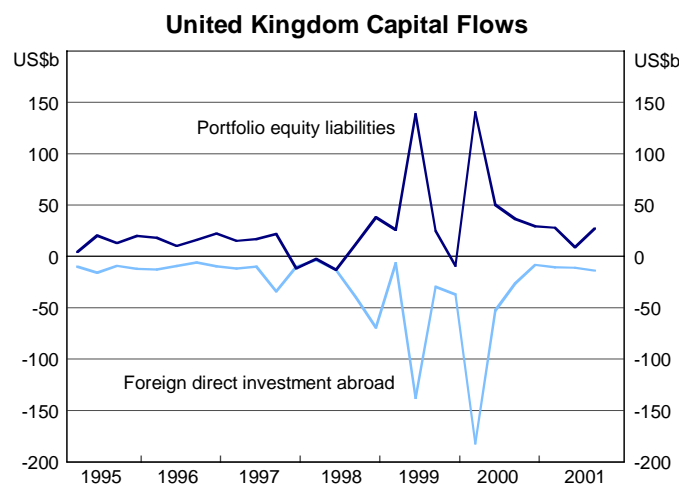
International capital movements are generally deemed to occur on the basis of the residency principle rather than the actual origin of the flow. That is, a capital flow is deemed to have occurred when a domestic resident transacts with a non-resident entity. However, it is entirely possible for such a transaction not to involve an exchange of foreign currency. If for example the foreign entity is using its holdings of Australian currency to transact with a resident entity this is not going to have an exchange rate impact.

Similarly, a foreign company may have invested in a country's share market in the past, giving rise to a portfolio equity inflow. Assuming the host country's capital markets are deep enough, it is possible that this investment can be liquidated, with a new investment in the same host country, say direct investment, financed entirely

from the proceeds. In this situation the balance of payments would record a portfolio equity outflow and a direct investment inflow of equal and offsetting magnitudes. Neither transaction, however, would at any stage involve purchases or sales in the foreign exchange market.<sup>15</sup> Clearly then there may be interrelationships between the recorded flows that are important in forming an understanding of capital movements. Whereas we suggested earlier that disaggregation of the capital account is important, this is one example where it is critical to keep the overall flows in perspective.

#### 6.4 Interrelationship between the measured flows

There is another noteworthy source of interaction between capital flows. In recent years it has been increasingly common for takeovers to be financed through a combination of cash and stock-swaps where the acquiring firm offers to swap one of its shares for those of the firm to be acquired. While the direct investment part of the transaction shows up as a capital outflow from the country in which the acquiring firm is domiciled, the stock-swap is recorded as a portfolio equity inflow. The effect is most visible in data for the United Kingdom where recent mergers and acquisitions have been relatively large.



In early 2000 Vodafone Plc, domiciled in the United Kingdom, acquired the German firm Mannesmann AG in a deal almost entirely financed through a stock-

<sup>15</sup> Note also that this highlights the fact that it is impossible to make value judgements about 'good' and 'bad' capital flows. There is no guarantee that capital that flowed in as one type will ever flow out in the same form if capital markets are sufficiently deep.

swap that was the largest takeover on record. Not surprisingly, the foreign direct investment outflow associated with the deal showed a sharp spike. The agreement to swap Vodafone shares for Mannesmann shares gave rise to a portfolio equity inflow into the United Kingdom of offsetting magnitude. Exclusive focus on one or the other flow would have resulted in a misinterpretation of the data. While this influence is most visible in the data for the United Kingdom, similar effects affect the Australian data.<sup>16</sup>

## **6.5 Revisions and estimation errors**

Section 2 had briefly touched on the errors and omissions in the balance of payments being largely attributable to estimation problems with the capital account. These errors and omissions average out to be close to zero over long periods of time, but can be large and persistent over shorter intervals. This, in conjunction with problems in accurately determining the seasonal patterns in the flows complicates the interpretation of successive observations.

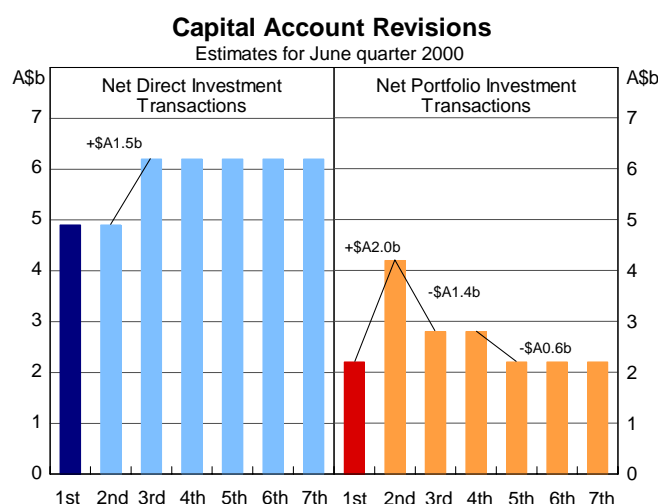
In its assessment of the quality of the published balance of payments estimates the Australian Bureau of Statistics rates most components of the current account either A or B – on a scale from A to D, with A being the most reliable estimate. However, all components of the capital account are given relatively poor ratings of either C or D.<sup>17</sup>

Furthermore, the same factors that give rise to large initial estimation errors also lead to substantial revisions to the initially published data as additional information becomes available. The real time use of the data for applied analysts such as market participants and policy makers is therefore considerably complicated.

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<sup>16</sup> This interdependence between the flows naturally has a bearing on the casual descriptive statistics presented in section 5 above.

<sup>17</sup> Portfolio liabilities are the least reliable, with its D grading corresponding to a margin of error exceeding 15 per cent. Refer also to Australian Bureau of Statistics (1998).



The revisions made to the capital account flows are highlighted when examining successive estimates for net direct and net portfolio flows for the June quarter 2000. The third estimate for direct investment revised up the flow in that three-month period by around \$1.5 billion, a considerable change six months after the first estimate was published. The revisions to portfolio flows are even more striking. The initial estimate for the June quarter 2000 was revised up by \$2 billion in the next release of the balance of payments, then revised back down by \$1.4 billion six months after the initial print, and was trimmed back by a further \$0.6 billion on the fifth estimate. Not only are the revisions large, they may even change sign as new information comes to hand.<sup>18</sup>

With this in mind, analysts are wise to use caution when interpreting the most recently available data.

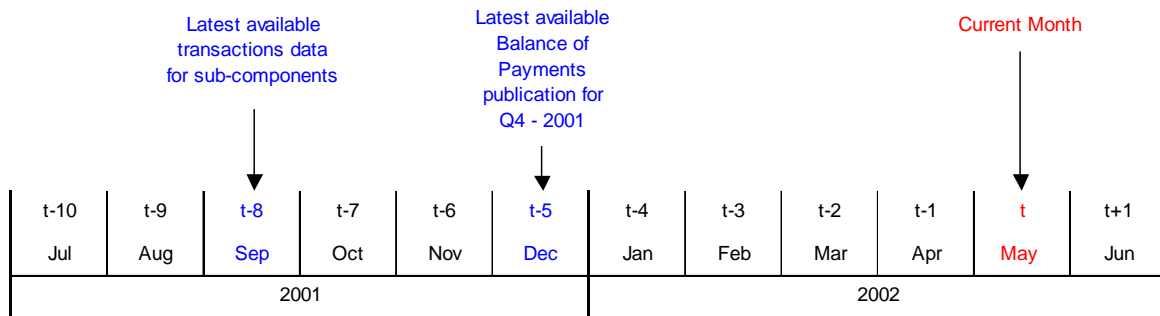
## 6.6 Timeliness

Leaving aside the abovementioned data concerns, the timeliness of published statistics is probably the most limiting practical constraint.

The Australian balance of payments and international investment statistics are released on a quarterly basis, two months after the end of the quarter. In May 2002

<sup>18</sup> These revisions are not peculiar to the Australian data. Lipsey (1999) notes that the initial estimate of United States portfolio investment abroad at the end of 1994 was US\$556 billion, which was subsequently revised up by 64 per cent to US\$910 billion (refer to page 15 of the paper).

we therefore had access to most of the data for the December quarter of 2001. However, some of the key transactions data we are interested in is only released with a further 3 month lag, so that at the time of writing (almost the middle of 2002) the most recent observation for the relevant data set is only for the end of the September quarter of 2001, a lag of around 8 months.



The lack of timeliness therefore greatly compromises the relevance of balance of payments data from the point of view of market participants and policy makers.

The remaining interest is therefore generally restricted to intellectual curiosities about what events may have determined exchange rate movements at a certain point in history. This is still important and relevant to understanding the present, but somewhat less for making assessments about the current juncture and expected future changes in exchange rates.<sup>19</sup>

## 7. Concluding comments

This paper was motivated by the recent interest in the role that capital flows may play in the determination of exchange rate outcomes. We explore some of the theoretical and practical features of the data in an attempt to understand better how they might be used in models of exchange rate determination.

<sup>19</sup> Alternative sources of capital flows data attempt to overcome this constraint. Most notable among these are the portfolio flow data compiled by large institutional investors such as State Street International and Deutsche Bank. However, the usefulness of these data remains somewhat difficult to assess given its inaccessibility. Its application is therefore often only peripheral.

We raise the question whether some types of capital flows should be more important than other types of flows, and propose that at least part of the answer may be found in the extent to which the flows are hedged.

We also find some evidence of correlation between different types of flows, and in particular that money market flows may tend to offset changes in other flows (as happened in Australia through 2000). This substitutability between the flows tends to make the overall capital account less volatile than any of its components. The notion that some flows such as foreign direct investment are of a longer-term nature than flows such as money market flows is dispelled, citing evidence for Australia and the United States. Foreign direct investment is in fact more volatile than the flows often termed 'hot money'.

Of the remaining data issues and limitations, the most important are the unreliability of initially published estimates and the lack of timeliness.

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