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Autumn 2005

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Economic forecasting: history and procedures

John Hawkins[1]

Macroeconomic forecasting in some form has a long history, although its current nature is a product of the Keynesian revolution. Forecasting is an important part of the budgetary process.

Treasury has a wide-ranging approach to forecasting, gathering insights from business liaison, econometric models (both single equations and an economy-wide model) and partial and leading indicators, interpreted with a good deal of judgement.[2] The forecasts are discussed both within Treasury and with other government agencies. Over time, Treasury has made public more details of its forecasts. The accompanying narrative also now gives more attention to risks and uncertainty surrounding the forecasts.

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2   Earlier articles on forecasting within Treasury appeared in the Autumn 1992 and Autumn 1996 Economic Roundups.

Introduction

Economic forecasting is a prerequisite for a forward-looking macroeconomic policy. It is a necessary part of the inflation-targeting regime currently in place for monetary policy. Even if fiscal authorities eschew countercyclical fiscal policy in favour of adhering to medium-term rules, economic forecasting is necessary to frame a budget. Treasury's forecasts are used by many government agencies and it has been noted that they heavily influence private sector forecasts.[3] But in producing and using economic forecasts it is important to be aware of their limitations.[4]

A brief history of economic forecasting

Macroeconomic forecasting in some form has a long history. The ancient Egyptians foretold harvests (a large part of what we would call their GDP) from the level reached by the Nile in the flood season. The Oracles of Delphi and Nostradamus are early examples of often ambiguous forecasters. In the 17th century Sir William Petty discerned a seven-year business cycle, suggesting a basis for systematic economic forecasts. In the USA a forecasting industry developed around 1910-1930 but much of it was wiped out by the Great Depression — which it failed to foresee![5]

Macroeconomic forecasting as we know it today was a product of the Keynesian revolution. Official forecasts were produced regularly soon after World War II in the Scandinavian countries, and the practice spread to the UK in the early 1950s and most other advanced economies by the 1960s.

Macroeconomic forecasting requires macroeconomists and macroeconomic data. The Australian Treasury started to recruit specialist economists by the late 1930s.[6] Distinguished economists such as future secretaries Fred Wheeler and Roland Wilson and future Reserve Bank governor HC 'Nugget' Coombs joined Treasury around the start of World War II.[7]

The first official estimates of Australia's national income on a Keynesian basis referred to the years 1938-39 to 1944-45 and were published with the 1945 budget as *Estimates of*

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3   For example, Pagan et al (1982) comment that many private sector forecasters 'seem to adjust [their forecasts] towards those given in the budget'.

4   As Stevens (1999) put it, 'one of the key objectives of good policy-making is to try to lessen the sensitivity of outcomes to forecast errors as much as possible'.

5   Some of these early forecasters are discussed in Cox (1929) and Lebergott (1945).

6   The Commonwealth (central) Bank appointed its first economist in 1931. By 1946 the Bank was forecasting the main national accounts aggregates and by the 1950s such exercises occurred a number of times during the year.

7   Treasury (2001) gives a history of the department.

National Income and Public Authority Income and Expenditure.[8] The first macroeconomic forecasts for Australia were prepared around the same time.[9] They appeared in some early drafts of the *White Paper on Full Employment* in 1945 but not in its final published version.[10] The first public references to the outlook for national income started to appear in the budget speeches in the 1940s. A brief discussion of prospects for the forthcoming year first appeared in the supporting statements to the budget in 1968. They did not evolve into an explicit table of detailed forecasts until 1986.[11]

In the early 1960s Treasury and the Reserve Bank started regular meetings to discuss macroeconomic forecasts. These became formalised as the National Income Forecasting Committee, the forerunner of the Joint Economic Forecasting Group.[12]

At the same time as judgemental forecasting was being developed, more formal approaches were being made possible by the construction of econometric models of the Australian economy. A small national accounting model had been estimated by Trevor Swan (1943, 1945) in the Department of Post-War Reconstruction. Although Swan's efforts were praised as a breakthrough by Colin Clark (1949), they did not progress far and were not published until after his death. The first Treasury model, constructed in conjunction with the Commonwealth Bureau of Census and Statistics (forerunner of the Australian Bureau of Statistics), was the National Income Forecasting (NIF) model; presented in Higgins (1970).[13] The NIF model went through a

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8 Interestingly, Australia had been a pioneer on national income estimation, with the world's first official national income statistics published in annual publications starting with Coghlan (1887); see Haig (2001). But Coghlan's work, far ahead of its time, was not sustained. Coombs (1944) presented some 'semi-official' national income estimates for 1938-39 and projections for 1947-48.

9 There had been earlier unheeded calls for forecasts. Copland (1923) hoped that 'business barometers' would soon be prepared for Australia and Walker (1929) expressed the 'vital need' for forecasting.

10 Cornish (1981) describes the evolution of the White Paper.

11 There had been a long tradition within Treasury of opposition to publication of forecasts. When the first forecasts were being prepared for possible inclusion in the White Paper, future secretary Wheeler successfully argued against it on the grounds that '(a) the estimates would be understood only by a limited number of people, (b) would be misunderstood by many, and (c) would be generally misused by sectional interests.' (cited by Cornish (1981).)

12 Around the same time private sector forecasting developed. There had been annual reviews of the Australian economy in the *Economic Record* from 1956 to 1967, which usually contained some forecasts, but there were few others in the public domain. Philip Shrapnel started the first newsletter with quantitative economic projections. The Institute of Applied Economic and Social Research at the University of Melbourne started publishing short-term forecasts in 1968.

13 Around the same time a team at the Reserve Bank developed the first of what were later called the RBI models; Norton (1969). There were also a number of models estimated by Australian academics during the 1960s — Nevile (1962), Kmenta (1966), Cameron (1967), Podder (1969) and Zerby (1969) — but only Podder's model was used for forecasting.

considerable evolution, up to NIF-10, before a revamp as NIF-88; see Higgins and Fitzgerald (1973), Treasury (1981, 1984) and Simes and Horn (1988). NIF-88 was described at the time as a medium-sized model, with 97 behavioural equations.

A new stream of modelling was commenced in Treasury around 1991. The Treasury Macroeconomic Model (TRYM) is smaller (25 estimated behavioural equations), with more emphasis on a theoretical basis for equations and their steady-state properties. Most equations are specified in an error correction model format which makes a clear distinction between short- and long-run properties. Some subsets of equations were estimated as a system; Taplin et al (1993).

From 1994 the budget was switched from August to May, making the task of forecasting a fiscal year that runs from July to June somewhat harder. While the government's forecasts in the annual budget papers remain the focus of Treasury's forecasting, the *Charter of Budget Honesty Act 1998* requires that an updated set of forecasts be presented in the *Mid-Year Economic and Fiscal Outlook* (MYEFO), released in October-January. It also requires preparation of an abbreviated set of forecasts, the *Pre-Election Economic and Fiscal Outlook* (PEFO) when a federal election is called. Accordingly, PEFOs have been released in September 1998, October 2001 and September 2004. As well as forecasts, the budget papers, MYEFOs and PEFOs include projections, based on long-term average growth rates, for subsequent years.

The current forecasting procedures

Treasury generally has two major forecasting rounds in the year. One is used as the basis for the government's forecasts published in the budget each May. Another forms the basis for the revised forecasts published in the MYEFO in October-January. Two other rounds are also held, around June and December. As they come soon after the intensive forecasting for the budget and MYEFO (usually published in November) respectively, these rounds tend to be less formal. Sectoral analysts continually monitor economic developments, assessing these data for their implications for the forecasts.

Before the start of each forecasting round, information is gathered from business liaison visits.[14] These involve Treasury economists visiting some of the state capitals and regional centres to speak with large, medium and small businesses, industry

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14   The liaison procedures are discussed in more detail in the Spring 2001 Roundup. The liaison programme was commenced in the early 1990s and from 1992 to 1999 was largely conducted by offices in Sydney and Melbourne. Since 2000 the programme has been run out of Canberra. Summaries of the key findings have been included in almost every issue of the Roundup since Winter 2002.

organisations and State Treasuries. A typical liaison round involves around 100 meetings over a two-week period.

The forecasting round gathers pace with the release of the quarterly national accounts, about two months after the end of the quarter to which they refer. The national accounts form the framework for the forecasting exercise. The technical assumptions about interest rates, exchange rates and oil prices are reset in the light of recent developments.[15] Treasury's International Economy Division provides its latest assessment of the world outlook. Any changes to fiscal policy are also incorporated. A range of other statistical releases from the Australian Bureau of Statistics and information from other government departments and private sector surveys are also analysed.

Sectoral teams within the Domestic Economy Division assess the implications of all this information for their forecasts using a mix of single-equation econometric models, partial indicators (for example, retail sales for private consumption), leading indicators (for example, housing loan approvals for dwelling investment), business surveys (for example, private sector surveys covering confidence and hiring intentions and the ABS survey of capital expenditure intentions), and advice from specialist agencies such as the Australian Bureau of Agricultural and Resource Economics and the Tax Office. The judgement is informed by economic theory and assessments of recent economic analysis. The teams discuss their forecasts with their colleagues and management and present them to a meeting of the division for review. Another perspective is supplied at these meetings from the forecasts generated by the TRYM model.

An iterative process is used to ensure consistency between the various elements of the forecast (for example, employment is an important influence on private consumption and hence GDP, but GDP also strongly influences employment). The individual sector forecasts are linked together using the National Accounts Forecasting Framework, rather than in an econometric model, although the TRYM is also used as a consistency check.

An internal quality test of the forecasts follows by presenting them to senior management within Treasury. They are then subject to an external quality test at the

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15 The major forecasting rounds assume that the Reserve Bank's cash rate target will be maintained at its current level for the forecasting horizon, that exchange rates will remain around recent average levels, and that oil prices will follow the path embodied in futures markets. In the case of exchange rates (and possibly oil prices), the economic literature suggests forecasters would be unlikely to do any better if they tried to forecast them. In addition to the base forecasts predicated on these assumptions, the sensitivity of the forecasts to alternative assumptions (for example, interest rates moving as suggested by futures markets, or oil prices staying at current levels) may also be examined. The TRYM model is particularly helpful in these sensitivity analyses.

Joint Economic Forecasting Group meeting, where the forecasts are discussed with representatives from the Reserve Bank, the Australian Bureau of Statistics and the Departments of the Prime Minister and Cabinet and Finance and Administration.

Lessons from the history of forecasting

Perhaps the main lesson that has been drawn from the history of forecasting is the need for appropriate humility about the task. To adapt an adage attributed to Socrates, economic forecasters may be wiser than are other commentators as they are at least aware of the extent of the uncertainties.

The consensus from the economic literature evaluating economic forecasts is that they are generally somewhat better than extrapolating trends. They tend to be better for macroeconomic variables such as inflation and GDP than for financial variables such as exchange rates or stockmarket prices. But they tend to have significant difficulties with large turning points. There also is a common tendency for forecasters to engage in 'forecast smoothing', which leads to a succession of revisions in the same direction over successive forecasts.[16]

But while accepting that forecasting is difficult, forecasters should keep trying to improve. Analysing forecast errors can be an important part of this process. Finding that an econometric model, or a set of judgements, has been consistently overpredicting may be a sign that the approach has missed some structural change in the economy.[17]

Much discussion of forecasts focuses on the point estimates, but arguably more important is the accompanying narrative about the forecasts.[18] Given that no forecast is likely to be *exactly* right, a particularly important part of such a narrative is a discussion of the risks and uncertainties around the central forecast. Since Knight (1921), economists have used the term 'risk' to refer to situations where there is knowledge about the probabilities of alternative outcomes and 'uncertainty' when there is no such knowledge. Tossing a coin involves risk but not uncertainty, as while

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16 Loungani (2000) cites two conjectures by Nordhaus to explain this; 'the first is that forecasters are fearful that "jumpy" or "jagged" forecasts will be treated as inconsistency by their bosses or customers. Second, studies from behavioural psychology suggest that people tend to hold on to prior views for too long'.

17 This may be particularly likely to occur when using cointegration models which may keep trying to forecast a return to an outmoded equilibrium; Stevens (2004). A similar point is made in a more technical way by Hendry and Clements (2003), who argue that the key sources of forecasting failure are deterministic shifts in levels or trend equilibrium values rather than parameter instability.

18 Stevens (1999) opines that this is the most important and useful part of the forecast.

the outcome of a future toss is not known, the probability of tossing heads is known to be a half. This distinction can be applied to the forecasting process. For example, the outlook for the Australian economy may be influenced by whether the Federal Reserve raises US interest rates. Data from US financial markets might indicate there is, say, a one-in-four chance of US interest rates rising by 25 basis points, which could be regarded as posing a *risk* to the forecasts of the Australian economy. But in addition there is *uncertainty* about how the exchange rate would respond to a 25-basis-point rise in US interest rates, how much global demand would fall in response to the interest rate rise, and so forth.

When these risks and uncertainties are considered, rather than a single point forecast, a probability distribution of forecasts around the central (most likely) forecast can be constructed. Calculating these distributions is a complicated matter. One relatively simple way of presenting the probability distribution is just to look at the past record of forecasting errors and assume that current forecasts will have a similar degree of accuracy. In this way, a 'confidence interval' could be constructed around the forecast. So, for example, if the average error on previous GDP forecasts had been 0.5 percentage points, the forecaster might say 'our forecast for GDP growth next year is 3 per cent, and we think that there is a 95 per cent chance GDP growth will be between 2 and 4 per cent'.

Recent advances in economic theory and computing power mean that it is now feasible to go beyond this and present probability distributions that allow for the fact that there may be more risks and uncertainties at some times than others. For example, the Asian financial crisis was unexpected and unprecedented and so it would be reasonable to think there was more uncertainty around forecasts in October 1997 than there had been in May 1997. This more sophisticated approach also allows for the possibility that there may be more downside risks around the most likely outcome than upside risks, that is, that the probability distribution may be not be symmetric. [19]

The budget papers do not explicitly spell out a probability distribution, but have gradually given more space to discussion of risks and uncertainties around the forecasts.

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19 Some forecasters have tried to quantify these risks using 'fan charts'. Probably the best known of these is the Bank of England's 'rivers of blood' chart which shows the area of highest probability as the darkest shade of red and progressively lighter shades for less likely outcomes. See Britton et al (1998) for a full description.

Conclusion

Economic forecasting is difficult. Perhaps the absurdist playwright Ionesco (1959) had economic forecasters in mind when he wrote 'you can only predict things after they have happened'. But producing forecasts is necessary, as they are an essential underlying feature of the budget. Treasury therefore continually tries to make its forecasts more accurate and more useful. This includes increasingly presenting more than just a set of numbers. The budget forecasts aim to provide a coherent narrative about the economic outlook, and the risks and uncertainty surrounding it.

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Forecasting the macroeconomy

Robert Ewing, David Gruen and John Hawkins[1]

This article examines Treasury's macroeconomic forecasting performance over the period from 1989-90 to 2003-04, with a focus on forecasts of nominal and real GDP, the GDP deflator, the unemployment rate, and CPI inflation.

The forecasts show little evidence of bias although, in common with most forecasts, they tend to underestimate large changes. As an important example of this general pattern, the recession of the early 1990s was not forecast. Over more recent years, forecasting errors have been significantly smaller, although this is explained, at least to some extent, by the more stable economic environment since the early 1990s recession.

Over recent years, forecast errors in real GDP and the GDP deflator have tended to offset each other. As a consequence, nominal GDP forecasts have been more accurate than those of either real GDP or the GDP deflator. This has likely occurred because of a predominance of unanticipated supply side shocks over recent years, which have moved real output and prices in opposite directions. The forecasts of CPI inflation have been significantly more accurate than those of the GDP deflator, suggesting that the broader basket of economy-wide prices that together make up the GDP deflator are particularly difficult to forecast.

Introduction

Treasury forecasts the macroeconomy as part of the process of forecasting expenditure and revenue for the budget, and more broadly to assist in the framing of forward-looking policy advice.[2] Far from being a perfect science, macroeconomic forecasting is in some ways more of an art. Predicting human behaviour is inherently more difficult than predicting physical phenomena. The speed of light is constant and can be measured precisely; not so the marginal propensity to consume. It is challenging to capture the key features of a complex modern economy in a framework simple enough to be tractable. Economies are subject to gradual structural change and buffeted by a range of shocks. Collection lags and revisions mean that forecasters can do no better than make informed estimates of the current state of the economy; by contrast for example, weather forecasters can at least be sure about whether or not it is currently raining. In short, 'economic forecasters aren't stupid; what we are trying to do is hard'; Gruen (2000).

Part of the process of improving forecasting performance involves assessing past performance. This article reviews Treasury's forecasting performance for some of the major economic aggregates over the period since 1989, with a particular focus on nominal GDP and its components, real GDP and the GDP deflator. This focus is part of a substantial effort within Treasury to improve the quality of the forecasts of nominal GDP, which are an important input into forecasts of taxation revenue.

Treasury conducts four forecasting rounds each year. In each round, forecasts are generated for (at least) the current and next financial years. As a consequence, the outcome for each macroeconomic aggregate in each year is forecast many times. The two major forecasting rounds form the basis for the forecasts published in the budget papers and in the *Mid-Year Economic and Fiscal Outlook* (MYEFO). The quality of forecasts can be measured in a number of ways, but most approaches tend to yield similar results. Box 1 discusses the two measures used throughout this paper, which measure the bias and accuracy of a set of forecasts.

Gross domestic product

Gross domestic product (GDP) is a key macroeconomic variable. Treasury forecasts both nominal (current price) and real (chain volume) GDP. Nominal GDP measures the value, in current dollars, of the economy's aggregate production of goods and services, while real GDP is a measure of the quantity of goods and services produced, and hence is a measure of the aggregate level of activity in the economy.

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2   See 'Economic forecasting: history and procedures'   in the Economic Roundup, Autumn 2005 for more on the reasons why Treasury forecasts, and the procedures used.

Nominal GDP

Table 1 shows how Treasury's forecasts of year-average nominal GDP growth have performed relative to the Australian Bureau of Statistics' (ABS) first published estimates of the outcomes. Table 2 shows the performance of the same set of forecasts, but this time compared to the ABS's most recent estimates of the outcomes.[3]

Table 1: Performance of nominal GDP growth forecasts against first published outcomes

	1989-90 to 2003-04(a)		1990-91 to 1994-95		1995-96 to 2003-04	
	Mean error	MAPE(b)	Mean error	MAPE(b)	Mean error	MAPE(b)
	% points	% points	% points	% points	% points	% points
All forecast rounds	0.54	1.09	1.88	1.90	-0.10	0.74
March forecasts(c)	0.95	1.68	2.99	2.99	-0.18	0.95
September forecasts(d)	0.60	1.32	2.35	2.35	-0.29	0.90

(a) Only the final four of the six forecasting rounds are available for 1989-90.
(b) Mean absolute percentage error, see Box 1 for description.
(c) March forecast round for the financial year starting in July of the same year.
(d) September forecast round for the financial year that started two months earlier.

Table 2: Performance of nominal GDP growth forecasts against most recent estimated outcomes

	1989-90 to 2003-04(a)		1990-91 to 1994-95		1995-96 to 2003-04	
	Mean error	MAPE(b)	Mean error	MAPE(b)	Mean error	MAPE(b)
	% points	% points	% points	% points	% points	% points
All forecast rounds	0.15	1.00	1.37	1.62	-0.44	0.74
March forecasts(c)	0.55	1.43	2.48	2.48	-0.52	0.85
September forecasts(d)	0.20	1.15	1.84	1.84	-0.63	0.90

(a) Only the final four of the six forecasting rounds are available for 1989-90.
(b) Mean absolute percentage error, see Box 1 for description.
(c) March forecast round for the financial year starting in July of the same year.
(d) September forecast round for the financial year that started two months earlier.

The mean error in the forecasts depends importantly on whether they are compared with the first-published or most recent estimated outcomes. On average over the full sample, Treasury's nominal GDP growth forecasts are 0.54 percentage points higher than the first-published outcomes but only 0.15 percentage points higher than the most recent estimated outcomes. On average over the more recent period, 1995-96 to 2003-04, the forecasts are 0.10 percentage points lower than the first-published outcomes, but 0.44 percentage points lower than the most recent estimated outcomes.[4]

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3   The December quarter 2004 National Accounts release (Australian Bureau of Statistics cat. no. 5206.0) was the most recent available when this article was written.

4   It should be noted, of course, that many more revisions have been applied to the most recent estimated outcomes for the earlier years in the sample than for the more recent years.

Box 1: Measures of forecasting performance

Two commonly used measures of forecasting performance are the mean error and the mean absolute percentage error. For growth rates these are calculated as:

$$\text{Mean error} = \frac{\sum (g_i^* - g_i)}{n} \qquad\qquad \text{Mean absolute percentage error} = \frac{\sum \left| (g_i^* - g_i) \right|}{n}$$

where g_i is the actual growth rate for the variable in period i, g_i^* is the forecast for growth in that period, both in percentage points, and n is the number of observations. The means can then be calculated for several years, and over several different forecast rounds.

The mean error measures the bias of the forecasts. A positive number indicates that, on average, the forecast tended to be larger than the outcome (overestimation bias) while a negative number indicates forecasts tended to be smaller than the outcome (underestimation bias).

The mean absolute percentage error measures the accuracy of the forecasts, as it measures the average distance between the forecast and the outcome. For both bias and accuracy, a smaller number indicates a better forecasting performance.

The main alternative is root-mean-square-error, which accords more importance to large misses. Most studies, such as Zarnowitz (1991) for the United States and Holden and Peel (1988) for the United Kingdom, find that conclusions are insensitive to the choice of measure. For cases where both measures may be misleading, see Macfarlane and Hawkins (1983).

Measures of bias and accuracy should be interpreted in the light of the series being forecast. Clearly, the average magnitude of the growth rate is important — a one percentage point bias in a series that grows on average by 40 per cent is a very different performance to a one percentage point bias in a series that grows on average by 2 per cent.

These differences occur because the ABS has revised up year-average nominal GDP growth outcomes from the first-published to the most recent (December quarter 2004) estimates by an average of 0.3 percentage points over the period. Virtually all of this is an upward revision to estimates of real GDP growth, rather than the GDP deflator.

For the remainder of this article we focus attention on comparing the forecasts with the most recent estimated outcomes as they presumably represent the ABS's current best estimates of the true outcomes. This is in line with the view that 'the main object of forecasting is to anticipate what will actually happen in the economy rather than what

the data source agencies, on the basis of incomplete information, initially estimated had happened'; McNees (1981).[5]

Chart 1 shows the evolution of Treasury's forecasts for year-average nominal GDP growth over the past fifteen years, as well as the most recent estimates of the outcomes. For some years, the last forecast differs noticeably from the outcome as we understand it today. This is usually because of significant revisions to the estimated outcome between the first and most recent National Accounts releases.[6]

The columns in the chart show the year-average GDP growth currently estimated by the ABS, and the lines show the evolution of the forecasts for that financial year over successive forecasting rounds. The first point on the line for each financial year shows the first forecast, usually made around two years before the end of the financial year in question (for instance, the first point on the line for 2003-04 is the forecast made in September 2002). The dot on each line shows the budget forecast for that financial year. It does not always appear at the same point on the line, as the budget moved from August to May in 1994, where it has remained, with the exception of the 1996 budget which was brought down in August.

As Chart 1 makes clear, most of the forecasting error, and the bias, arise from the first few years of the period, particularly 1990-91, 91-92 and 92-93. The recession of 1990-92 was not forecast and, as a result, nor was the speed of the transition to the new low-inflation environment.[7]

The visual impression left by Chart 1 is confirmed in the earlier tables which reveal significantly smaller mean absolute percentage errors (MAPEs) over the more recent years, 1995-96 to 2003-04, than over the earlier years.

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5   Of course, commentary on forecasts in the press mostly concerns the initial estimates. If the purpose of a forecast is to profit in financial markets, the relevant comparison is also with the initial estimates; Fildes and Stekler (2002). It should be noted that the definition of GDP was changed in 1998. However, this change in definition is not the major cause of revisions for most years, so for our purposes the comparison with the most recent estimated outcomes still seems the most appropriate.

6   See Pagan (2003) for the implications of these revisions for forecasting the following year.

7   The two factors, real output and prices, make roughly equal contributions to the forecasting error for nominal GDP in 1990-91, with the contribution from the GDP deflator rising to around two-thirds in 1992-93.

Chart 1: Evolution of nominal GDP growth forecasts
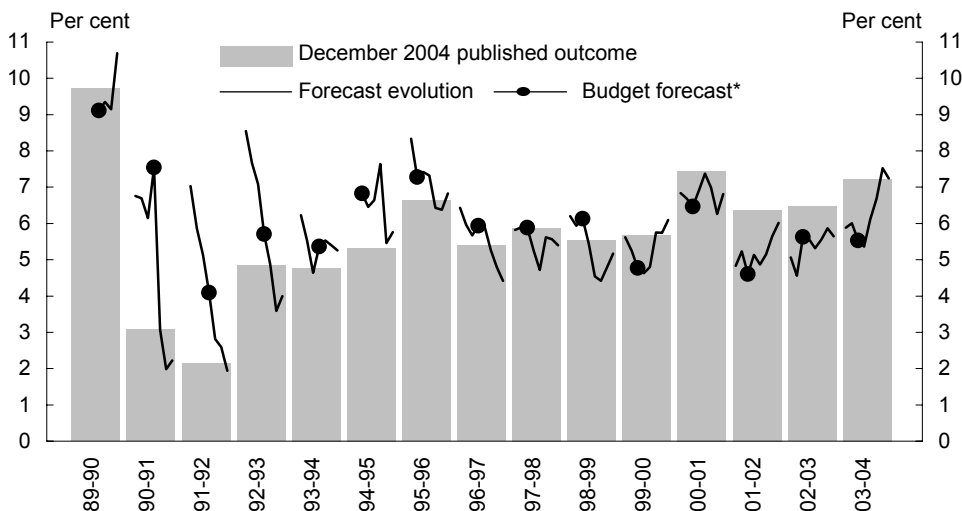
* For example, the 1993-94 budget forecast for 1993-94.
Source: Australian Bureau of Statistics 2004, National Income Expenditure and Product, cat. no. 5206.0, December, Canberra. Treasury forecasts.

Real GDP

Summaries of Treasury's overall forecasting performance for real GDP growth against the most recent estimated outcomes are shown in Table 3 and Chart 2.

Table 3: Performance of real GDP growth forecasts against most recent estimated outcomes

	1989-90 to 2003-04(a)		1990-91 to 1994-95		1995-96 to 2003-04	
	Mean error	MAPE(b)	Mean error	MAPE(b)	Mean error	MAPE(b)
	% points	% points	% points	% points	% points	% points
All forecast rounds	-0.19	0.74	0.19	0.82	-0.37	0.74
March forecasts(c)	0.00	0.98	0.81	1.08	-0.46	0.92
September forecasts(d)	-0.26	0.90	0.28	1.06	-0.48	0.91

(a) Only the final four of the six forecasting rounds are available for 1989-90.
(b) Mean absolute percentage error, see Box 1 for description.
(c) March forecast round for the financial year starting in July of the same year.
(d) September forecast round for the financial year that started two months earlier.

The forecasts of real GDP show a different picture to the nominal forecasts. Through the 1990-92 recession the forecasts significantly overestimated output initially. The recovery from the recession was forecast fairly accurately, and the size of the forecast errors, as well as the forecast movements in the remainder of the period, has been relatively small.

There are three obvious exceptions to this, namely the forecasts for the years 1998-99, 1999-2000 and 2000-01, where there were relatively large movements in successive forecasts of real GDP. These movements reflect the impact of the Asian financial crisis,

and the economy's response to the introduction of the GST. The Asian financial crisis was initially expected to have more of a contractionary effect on the Australian economy than turned out to be the case. By contrast, following the introduction of the GST, there was a bigger fall in activity in the dwelling sector than was expected.

Chart 2: Evolution of real GDP growth forecasts
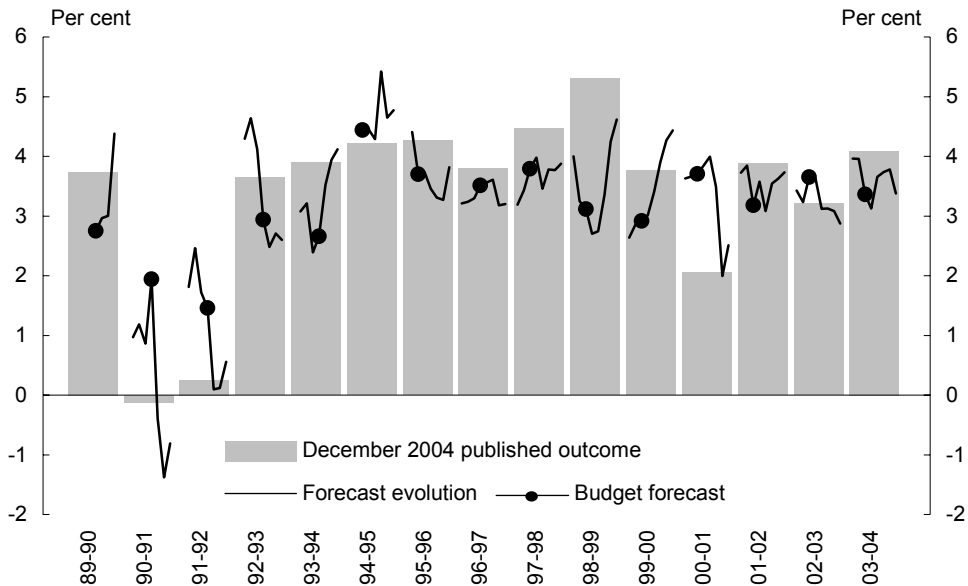
Source: Australian Bureau of Statistics 2004, National Income Expenditure and Product, cat. no. 5206.0, December, Canberra. Treasury forecasts.

GDP deflator

The GDP deflator is a measure of the aggregate prices of goods and services produced in Australia. Its growth rate is (approximately) the difference between growth in nominal and real GDP. Summaries of Treasury's overall forecasting performance for growth in the GDP deflator against the most recent estimated outcomes are shown in Table 4 and Chart 3.

Table 4: Performance of GDP deflator growth forecasts against most recent estimated outcomes

|	1989-90 to 2003-04(a)		1990-91 to 1994-95		1995-96 to 2003-04	
	Mean error	MAPE(b)	Mean error	MAPE(b)	Mean error	MAPE(b)
	% points	% points	% points	% points	% points	% points
All forecast rounds	0.35	1.02	1.21	1.25	-0.08	0.96
March forecasts(c)	0.53	1.37	1.63	1.63	-0.07	1.22
September forecasts(d)	0.46	1.09	1.53	1.53	-0.12	0.97

(a) Only the final four of the six forecasting rounds are available for 1989-90.
(b) Mean absolute percentage error, see Box 1 for description.
(c) March forecast round for the financial year starting in July of the same year.
(d) September forecast round for the financial year that started two months earlier.

Chart 3: Evolution of forecasts of growth in the GDP deflator
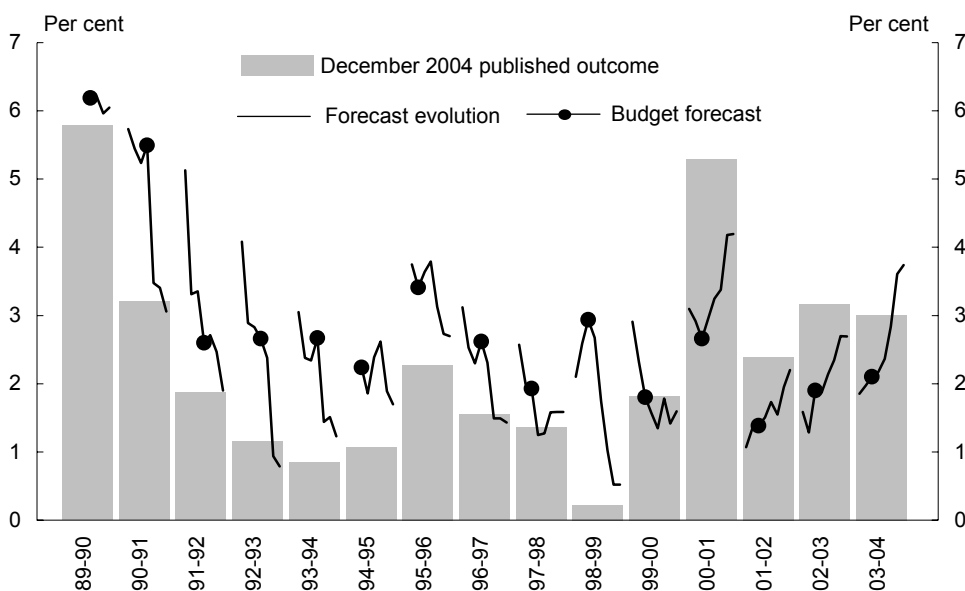
Source: Australian Bureau of Statistics 2004, National Income Expenditure and Product, cat. no. 5206.0, December, Canberra. Treasury forecasts.

Table 4 shows a very small mean error over the period from 1995-96 to 2003-04, but this is somewhat misleading as it arises from a rough cancelling of the overestimation in the late 1990s by the underestimation in the early 2000s. The MAPE is similar in these two sub-periods.

Growth in the GDP deflator was initially overestimated in every year from 1989-90 to 1999-2000, although the size of the overestimate fell on average through the decade. And then from 2000-01 to 2003-04, growth in the GDP deflator was significantly underestimated in every year (Chart 3). In several years, the last forecast differs substantially from the most recent estimate of the outcome; this arises largely because of revisions from the first-published to the most recent estimate of the outcome.

Towards an understanding of the forecast errors

Table 5 shows correlation coefficients between March forecast errors for nominal GDP growth and some of its main determinants over the years 1995-96 to 2003-04.[8] For each variable, the forecast error is the difference between its March forecast and its latest estimated outcome (though a different definition is appropriate for the exchange rate — see note (b)).

Table 5: Correlation coefficients between March forecast errors, 1995-96 to 2003-04

	Nominal GDP	GDP deflator	Real GDP	H cons deflator	Buildings deflator(a)	P&E deflator	Terms of trade	Exchange rate(b)
Nominal GDP	1.00							
GDP deflator	0.79	1.00						
Real GDP	-0.35	-0.85	1.00					
Household consumption deflator	0.63	0.73	-0.58	1.00				
Buildings deflator(a)	0.67	0.72	-0.53	0.16	1.00			
Plant & Equipment deflator	0.31	0.53	-0.53	0.61	0.33	1.00		
Terms of trade	0.67	0.69	-0.50	0.29	0.59	-0.13	1.00	
Exchange rate(b)	0.25	0.11	0.05	-0.01	0.19	-0.52	0.50	1.00

(a) Deflator for residential and non-residential buildings and ownership transfer costs.
(b) The exchange rate assumption is the average value of the TWI in the month before the March round forecasts are finalised. The outcome is not revised.

There is a strong negative correlation (-0.85) between the forecast errors for GDP deflator growth and real GDP growth. A strong negative correlation is also observed between the forecast errors for the same variables using forecasts produced by Access Economics at roughly the same times as the Treasury forecasts. These negative correlations suggest a predominance of unanticipated supply shocks over the period, since these shocks tend to move output and prices in opposite directions. Further analysis of this strong negative correlation seems a worthwhile exercise for the future.

A consequence of the strong negative correlation is that the nominal GDP growth forecasts have a smaller MAPE than the forecasts of either GDP deflator growth or real GDP growth. The MAPE for the March forecasts over the period, 1995-96 to 2003-04, is 1.22 for GDP deflator growth, 0.92 for real GDP growth but only 0.85 for nominal GDP growth (see earlier tables).

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8   Recall that the 'March forecast' is the forecast made in the March forecasting round for the financial year starting in July of the same year. For budgets brought down in May, the budget forecasts are used. These forecasts sometimes differ slightly from the forecasts coming out of the March forecasting round, because of the additional information that becomes available before the budget forecasts are finalised in early May.

The March forecast errors for nominal GDP growth are strongly positively correlated with the forecast errors for household consumption deflator growth, buildings deflator growth, and terms of trade growth (Table 5). Forecast errors in household consumption deflator growth and buildings deflator growth feed straightforwardly into errors in GDP deflator growth, and hence into errors in nominal GDP growth. However, the mechanism by which forecasting errors in terms of trade growth typically translate into forecasting errors in GDP deflator growth, and hence into errors in nominal GDP growth, is more complicated, and worth explaining.

Consider a typical forecasting error in terms of trade growth. For concreteness, assume that the March forecast is for the year-average terms of trade to remain flat over the coming financial year, but the outcome turns out to be a significant rise, driven by a strong unanticipated rise in world commodity prices. If there was no response by the Australian dollar exchange rate to the rise in world commodity prices, then the Australian dollar price of exports would have risen, which would feed directly into higher GDP deflator growth than had been forecast. This story is simple enough.

Typically, however, the exchange rate appreciates significantly with the rise in world commodity prices. As a consequence, there is a smaller (if any) rise in the Australian dollar price of exports than the rise in world commodity prices in foreign currency terms. At the same time, the Australian dollar price of imports falls as the exchange rate rises.[9] If this fall in import prices was immediately passed through into the domestic prices faced by final users (consumers and firms, in particular) then there would be no first-round effects on the price of domestic production, the GDP deflator (although there would still be positive income effects on the economy from the rise in the terms of trade).

In reality, however, the pass-through of import price changes to final prices is very gradual (especially to final consumer prices). While the gradual pass-through of a fall in import prices is under way, intermediaries along the chain from the docks to the shops experience a rise in their profit margins which contributes directly to a rise in the GDP deflator that was not previously forecast, and therefore to a rise in nominal GDP growth.

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9   The correlation between forecast errors in the terms of trade and in the exchange rate is 0.50 (Table 5). Furthermore, the correlations between changes in the terms of trade and changes in Australian dollar export and import prices support the generalisations in the text. Over the years 1995-96 to 2003-04, the correlation coefficient between the year-average growth rates of the terms of trade and export prices is close to zero (0.08), while that between the terms of trade and import prices is clearly negative (-0.45).

Other major economic variables

Unemployment rate

Table 6 and Chart 4 show the performance of Treasury's forecasts of the year-average unemployment rate for each financial year. Unlike the other variables in this article, the unemployment rate forecasts are compared to the first published outcomes. The majority of revisions to the unemployment rate between the first and most recent publications are due to changes in the definition of unemployment. As each forecast was made on the basis of a particular definition of unemployment, the most appropriate comparison is with the unemployment rate estimated at that time.

The forecasts for the unemployment rate show little overall bias. They do show some degree of conservatism, where the size of movements (both positive and negative) is consistently underestimated.[10] Through the early 1990s recession, the rise in the unemployment rate was consistently underestimated; more recently the fall in the unemployment rate was underestimated through periods when it was falling.

Table 6: Performance of unemployment rate forecasts against first-published outcomes

	1989-90 to 2003-04(a)		1990-91 to 1994-95		1995-96 to 2003-04	
	Mean error	MAPE(b)	Mean error	MAPE(b)	Mean error	MAPE(b)
	% points	% points	% points	% points	% points	% points
All forecast rounds	0.01	0.28	-0.13	0.42	0.08	0.22
March forecasts(c)	-0.01	0.41	-0.23	0.72	0.11	0.23
September forecasts(d)	-0.02	0.28	-0.18	0.44	0.06	0.22

(a) Only the final four of the six forecasting rounds are available for 1989-90.
(b) Mean absolute percentage error, see Box 1 for description.
(c) March forecast round for the financial year starting in July of the same year.
(d) September forecast round for the financial year that started two months earlier.

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10 A general tendency towards conservatism had been noted as early as Keynes (1936, p. 148), and confirmed in studies as early as Theil (1958), who concluded 'the most important systematic error … is the underestimation of change', and more recent work such as Fildes and Stekler (2002). Macfarlane and Hawkins (1983) note that this tendency becomes more marked with forecasts over longer horizons, which almost invariably contain a 'return to normality' for the out-years.

Chart 4: Evolution of unemployment rate forecasts
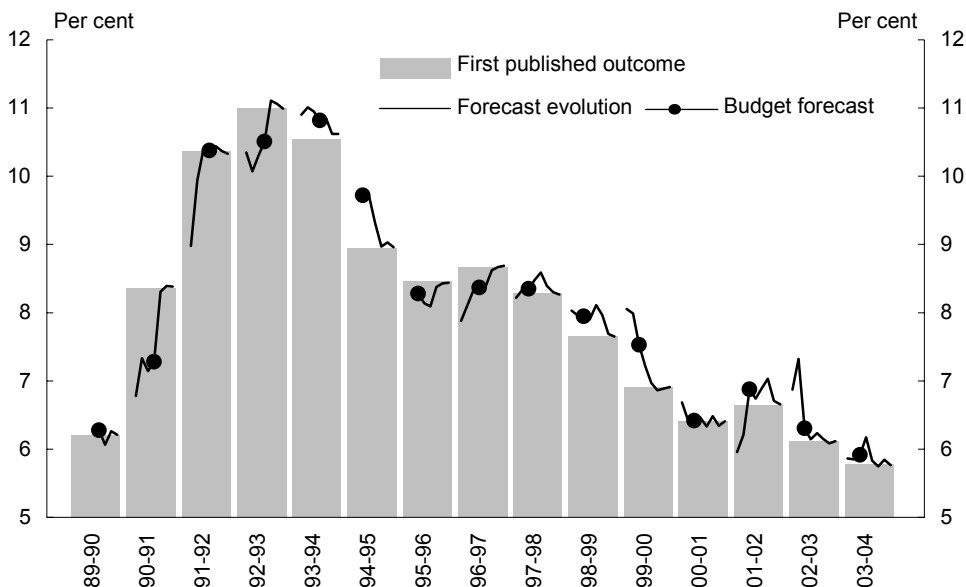
Source: Australian Bureau of Statistics 2004, Labour Force, cat. no. 6202.0, Canberra. Treasury forecasts.

Turning points are difficult to predict, as they require a forecast not only of the rate of growth, but also of the timing of the turning point. The performance of the unemployment rate forecasts is mixed in this regard. While the turning point in 1992-93 was predicted fairly well, the return to declining unemployment in 1998-99 was not, and similarly the start of the recent decline in the unemployment rate in 2002-03 was initially missed.

Consumer Price Index

Table 7 and Chart 5 show the performance of forecasts of year-average Consumer Price Index (CPI) inflation. Unlike the other variables discussed in this article, the CPI is not subject to revision. Hence the first estimate published by the ABS is always the same as the most recent estimate.

The first half of the 1990s shows a similar pattern of errors to those for the GDP deflator. The transition to, and sustainability of, low inflation in the early 1990s took time to be recognised in the forecasts. By contrast, from the late 1990s onwards, forecasts of CPI inflation have been very close to the outcomes. This can be attributed, in part at least, to the greater stability of the CPI in this more recent period, which in turn reflects greater experience with the 2 to 3 per cent medium-term inflation target.

## Table 7: Performance of CPI inflation forecasts against outcomes

	1989-90 to 2003-04(a)		1990-91 to 1994-95		1995-96 to 2003-04	
	Mean error	MAPE(b)	Mean error	MAPE(b)	Mean error	MAPE(b)
	% points	% points	% points	% points	% points	% points
All forecast rounds	0.33	0.57	0.63	0.85	0.19	0.46
March forecasts(c)	0.48	0.87	0.93	1.28	0.24	0.64
September forecasts(d)	0.34	0.48	0.75	0.84	0.19	0.33

(a) Only the final four of the six forecasting rounds are available for 1989-90.
(b) Mean absolute percentage error, see Box 1 for description.
(c) March forecast round for the financial year starting in July of the same year.
(d) September forecast round for the financial year that started two months earlier.

Chart 5: Evolution of Consumer Price Index forecasts
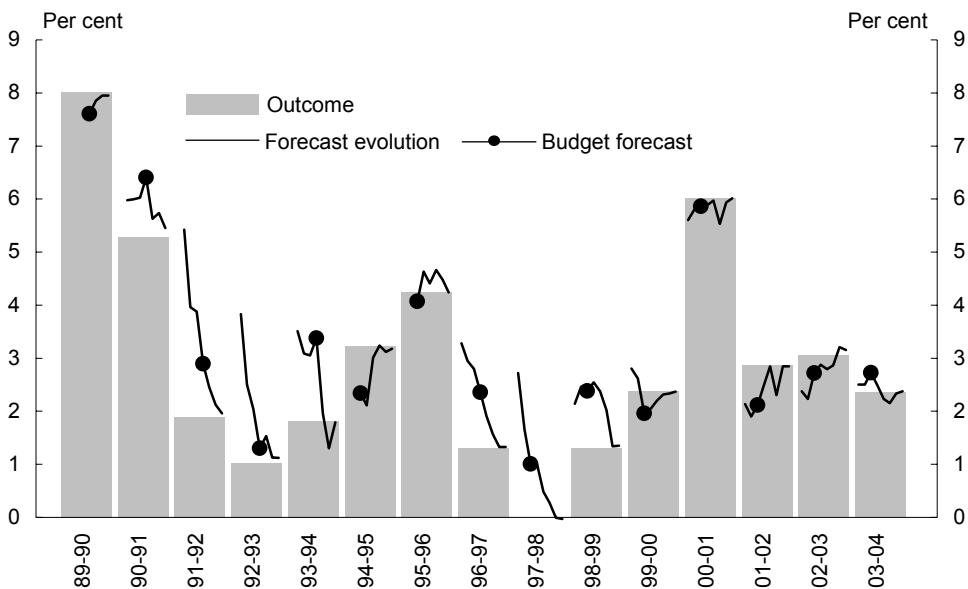
Source: Australian Bureau of Statistics 2004, Consumer Price Index, cat. no. 6401.0, December, Canberra. Treasury forecasts.

A comparison of mean absolute percentage errors reveals that Treasury forecasts have been significantly more accurate for CPI inflation than for the broader basket of economy-wide prices that together make up the GDP deflator.

One noteworthy year is 2000-01, when inflation was likely to be difficult to forecast due to the introduction of a new tax system, which had a widespread impact on prices. As events turned out, the CPI forecasts were remarkably close to the outcome — indeed closer than in many other years — although the GDP deflator forecasts were not (Chart 3).

The impact of major shocks on forecasting

Unexpected shocks cannot, by definition, be forecast. From a forecasting perspective, the interesting question is how the forecasts adjust to the new information and economic circumstances provided by the shock. Since 1989 there have been many shocks to the Australian (and world) economy. Two of the more recent of these were the Asian financial crisis in 1997-98, and the introduction of the GST in 2000.

The Asian financial crisis broke out in July 1997, soon after the 1997 budget forecasts were released.[11] Like other forecasters, Treasury had not foreseen the large devaluations of a number of Asian currencies and the subsequent contractions in their economies. The MYEFO released in December 1997 did not change the forecast for Australian real GDP growth in 1997-98, arguing that weaker external demand would be offset by stronger domestic demand, boosted by interest rate cuts. Somewhat weaker growth of 3¼ per cent was forecast for 1998-99. Again like other forecasters, Treasury initially underestimated the impact of the Asian crisis on the affected countries, arguing in terms of just a *slowing* rather than the large *contractions* in output which eventuated. The forecast for Australian real GDP growth in 1998-99 was lowered marginally in the May 1998 budget, and again in the September *Pre-election Economic and Fiscal Outlook* to 2¾ per cent. The forecast was restored to 3¼ per cent in the subsequent December MYEFO, which many commentators regarded as optimistic given the impact the crisis was by then having on Australia's Asian trading partners. In the event, these forecasts significantly underestimated the outcome — the Australian economy was remarkably unaffected by the Asian crisis and real GDP grew by 5¼ per cent in 1998-99.

Major changes to the Australian tax system, most notably a goods and services tax and large cuts in income taxes, were introduced in July 2000.[12] The budget forecasts in May 2000 incorporated some strengthening of consumption and dwelling investment before the tax changes came into effect, at the expense of some forecast weakening after they came into effect. This bringing forward and subsequent unwinding of dwelling investment turned out to be considerably greater than expected. With a rise in interest rates also dampening the sector (as a technical assumption, the budget forecasts are predicated on constant interest rates), dwelling investment contracted by over 20 per cent in 2000-01. Consumption and business investment were also weaker than expected. The December quarter 2000 national accounts showed a 0.6 per cent contraction in real GDP, which came as a surprise to almost all commentators — see Henry (2001), and real GDP grew by 2 per cent for 2000-01 as a whole.

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11 A contemporary account of the crisis is given in Goldstein and Hawkins (1998).
12 The impact of the tax changes is assessed in an article in the Autumn 2003 issue of the Roundup.

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Comparing Australian and United States productivity

Jyoti Rahman[1]

Despite a series of broad and deep macroeconomic and microeconomic reforms boosting Australia's productivity growth, the level of Australia's GDP per capita remains well below that of the United States. A continuing gap in the levels of productivity plays a central role in explaining Australia's GDP per capita relative to the US. This paper reviews various explanations for the Australia-US productivity gap and finds that the productivity gap can at least in part be explained by a combination of: differences in human capital as represented by educational attainment; differences in product and labour market policies; and the geographic and historical context in which the Australian economy operates. Differences in physical capital per worker and industry structures do not appear to be primary explanations for the productivity gap.

Reasons for analysing the Australia-US productivity gap

One way to analyse Australia's economic performance is through a comparison with the United States. Australia's GDP per capita is currently nearly 80 per cent of that of the US, having risen from around 75 per cent in the mid-1980s.

To provide a simple decomposition of the long-term evolution of GDP per capita, the Australian Treasury often uses the '3 Ps' framework. This framework breaks GDP per capita into three components — population, participation and productivity. Population is the proportion of the population that are of working age. Participation is the average number of hours worked by those of working age. Population and participation can be summarised together as hours worked per capita. The final P in this framework is labour productivity, represented by a standard measure — GDP per hour worked. The components of the '3 Ps' framework are multiplied together to give GDP per capita.

Australia's hours worked per capita have been between 90 and 105 per cent of those of the US over the past 40 years (Chart 1a). Over this period, Australia's GDP per hour worked has been mostly between 75 and 85 per cent of that of the US (Chart 1b).

**Chart 1: Australia's GDP per capita relative to the US —
decomposed using the 3 Ps framework**

Chart 1a: Hours worked per capita   Chart 1b: GDP per hour worked
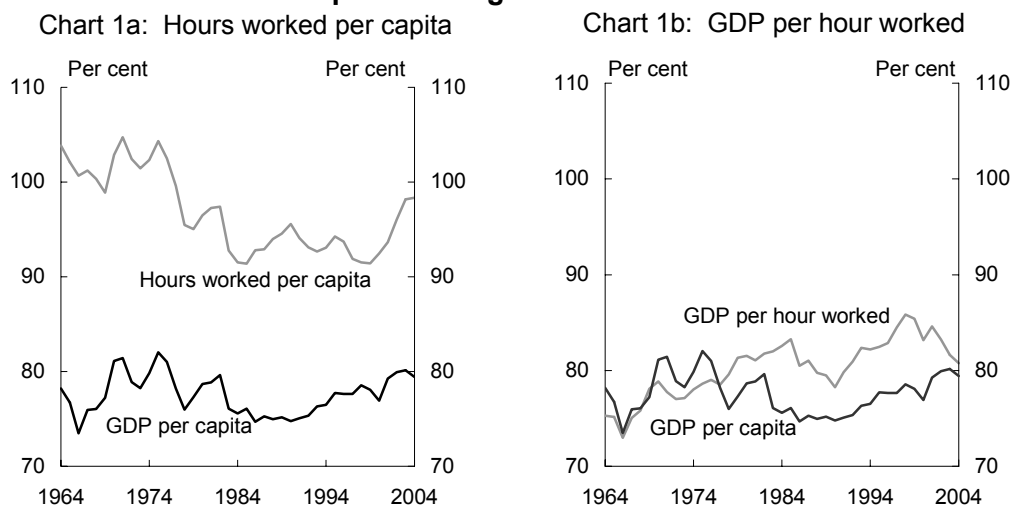
Source: Groningen Growth and Development Centre (GGDC) and The Conference Board, January 2005.

If Australian workers were as productive as their peers in the US in terms of output per hour, then hours worked per capita would determine GDP per capita relative to the US. Similarly, if Australian and US workers worked similar hours, then relative labour productivity would determine relative incomes. Chart 1 thus shows that the level of productivity plays a central role in explaining the Australia-US difference in

GDP per capita. For illustrative purposes, if Australia's labour productivity had been the same as that of the US in 2002, other things being equal, Australia's GDP per capita would have been about $7,900 higher.[2]

A key implication is that because the productivity gap is the main determinant of Australia's income gap with the US, there may be scope for future GDP per capita gains in Australia from catching up with the global productivity frontier represented by the US. A better understanding of the causes of the Australia-US productivity gap can help shed light on how much further productivity in the Australian economy may be able to catch up with that in the US, and the role that further policy reforms may play in any such catch-up.

This paper surveys various explanations for the Australia-US productivity gap. The explanations can be classified into three broad groups: relative factor intensities; differences in product and labour market policies; and, differences in the geographic and historical context in which the two economies operate. The three main sections of the paper are devoted to these groups.

First discussed are relative factor intensities. The analysis suggests that differences in the average level of human capital may explain part of the Australia-US productivity gap, but differences in physical capital per hour worked do not appear to be a major explanation for the gap. Whether differences in product and labour market policies can explain the productivity gap is explored next. A survey of the existing literature suggests that Australia could narrow the productivity gap by as much as one-sixth by further reforms of product and labour market regulations.

That said, differences in the geographic and historical context in which the two economies operate are likely to inhibit Australia's ability to close fully the gap with the US level of productivity. There are strong reasons to believe that part of the Australia-US productivity gap may be due to geography and history. Nonetheless, there remains much scope for future research to measure the importance of these factors on the productivity gap.

Before exploring these explanations for the Australia-US productivity gap in detail, the next section notes that there are substantial statistical and measurement issues surrounding international comparisons of productivity levels.

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2   Productivity data are volatile, cyclical and susceptible to revision. This is why 2002, rather than 2004, productivity levels are used for illustrative purposes.

Statistical and measurement issues

Measuring any economic variable is prone to error and international comparisons are often difficult. These problems are particularly acute for measurement of productivity. Part of the observed productivity gap between Australia and the US can probably be attributed to statistical and measurement issues inherent in cross-country comparisons. Some of these issues are briefly discussed below.

It is not easy to measure output and inputs separately in some industries. Methods of measuring output for many industries are different across countries or depend on uncertain links with wages. This is why the Australian Bureau of Statistics focuses on labour productivity in the market sector, which includes manufacturing and retail trade but not government administration. Similarly, the US Bureau of Labor Statistics publishes data for the private business sector.

Measuring output is particularly difficult for some sectors of the economy. Consider the health sector as an example. The ultimate output from the health sector is presumably good health. Australians enjoy longer, healthier lives than the populations of many countries including the US. Statistics imply that the US has more real economic resources devoted to, and more measured output from, the health sector. Clearly then, cross-country comparisons of output from health sectors are fraught with difficulties.

Another difficulty in cross-country analysis of productivity levels involves the choice of the exchange rate used to compare national data. Using market exchange rates is problematic for this purpose as market exchange rates do not always reflect relative price differences between countries. For instance, if an industry had lower prices in Australia than in the US, then output per hour worked in that industry would be understated in Australia relative to the US. The standard method used in international comparisons, which this paper also uses, is to convert national currency estimates of productivity into purchasing power parity (PPP) US dollar equivalents using standard PPP exchange rates.

Labour productivity is calculated as a ratio of output to hours worked. This makes labour productivity data susceptible to revisions in output and hours worked data. Hours worked data are strongly affected by cyclical factors, making cross-country comparisons particularly difficult. This means that the precise estimate of the Australia-US productivity gap at a particular point in time is likely to be affected by different stages of the business cycle in the two economies.

The issues discussed above suggest that the observed gap between the productivity levels in Australia and the US is only an approximation of the actual productivity gap.

Relative factor intensities and the productivity gap

This section discusses how much of the Australia-US productivity gap can be explained by differences in capital intensities — the amount of capital available to each worker. While there are significant limitations in the data, and hence a need for careful interpretation, differences in physical capital per hour worked seem unlikely to explain much, if any, of the Australia-US productivity gap. On the other hand, the data suggest that the average level of human capital is lower in Australia than in the US, primarily due to lower educational attainment among older workers. This difference may account for part of the productivity gap.

Capital-labour ratio

Australia's labour productivity level, measured as GDP per hour worked, was around 83 per cent of that of the US in 2002, compared with about 75 per cent in the late 1960s. However, labour is only one input into production. Labour productivity might be lower in Australia than in the US if the capital-labour ratio were lower in Australia (that is, if Australia used more labour-intensive production methods to produce the same good).

In addition to the various statistical and measurement issues mentioned above, international comparison of the contribution that capital per worker makes to labour productivity is difficult because comparable time series data on the physical capital stock for the whole economy are not available. This analysis draws on the *OECD Economic Outlook* (no. 76) data on capital stock in the business sector.

The business sector's share of GDP is lower in Australia than in the US (based on the *OECD Economic Outlook* national accounts). The difference in the business sector share of GDP is adjusted for by dividing the capital stocks in each country by their respective business sector's share of GDP. This implicitly assumes that in both countries, government sector capital intensity is identical to the corresponding business sector capital intensity.

This assumption allows us to estimate the contribution that the difference in capital-labour ratios makes to the gap in labour productivity. Chart 2 shows Australia's labour productivity and physical capital per hour worked relative to the US over the past four decades.

**Chart 2: Australia's labour productivity and
capital-labour ratio relative to the US**

Source: GGDC and The Conference Board, January 2005; OECD Economic Outlook December 2004;
the author's calculations.

It appears that the difference in capital-labour ratios does not account for much, if any, of the Australia-US productivity gap. Indeed, Australian workers seemed to use more capital per hour worked than their US counterparts in 2002.

The difference in labour productivity that is not explained by the difference in capital-labour ratios can be viewed as the Australia-US multi-factor productivity (MFP) gap. The Australia-US MFP gap captures the efficiency with which inputs of capital as well as labour are used in Australia relative to the US. It appears that the difference in MFP is a major driver of the Australia-US labour productivity difference, and more broadly the difference in GDP per capita.

Average level of human capital

The average level of human capital refers to the skills and knowledge of individual workers and their ability to use these skills and knowledge in the wider economy. A recent strand of economic growth literature stresses the importance of human capital in the production process (Mankiw, Romer and Weil 1992).

Differences in the average level of human capital may partly explain why productivity is lower in Australia than in the US. The ideal analysis would measure Australia's human capital stock relative to the US. However, it is very difficult to calculate the contribution of human capital in the production process. International comparisons are even more problematic.

Measures of educational attainment are often used as a proxy for human capital. Mankiw, Romer and Weil (1992) use the fraction of working age population that is in secondary school as a measure of investment in human capital. Adult literacy rates, life expectancies at birth and average years of schooling among the adult population are some other measures of human capital used in economic growth literature (Sachs and Warner 1997).

Dowrick (2003) uses the average years of schooling among the working age population as a proxy for human capital. His survey of the literature suggests that if the average years of schooling of young people in Australia were to rise by one year, real GDP would rise by up to eight per cent over about forty years. This result can be used to think about the effect that a rise in average years of schooling in Australia would have had on GDP.

Average years of schooling in the working age population have been around half a year lower in Australia than in the US over the period 1971 to 1998 (Bassanini and Scarpetta 2001). Had Australia instead achieved similar average years of schooling to the US over this period, then Dowrick's result suggests that by 1998 Australia's GDP might have been around 2 to 3 per cent higher than was actually recorded. This gives a back-of-the-envelope estimate of the contribution of education to the productivity gap (although the result does depend on assumptions about the effect of education on participation in the labour force).

The US has traditionally placed more emphasis on the achievement of at least an upper secondary education. Table 1 shows the effect of this emphasis. Five in six Americans aged 55 to 64 have at least an upper secondary qualification. In comparison, fewer than half of Australians aged 55 to 64 have at least an upper secondary qualification. The Australia-US gap in educational attainment has however narrowed in the most recent cohorts. As Australia's relative qualifications profile continues to improve with better educated cohorts entering the labour force, the productivity gap should narrow in the future (other things being equal).

Table 1: Highest qualification obtained, 25- to 64-year old population, (per cent by age group), 2002

	25-34	35-44	45-54	55-64	Total
Australia					
Tertiary	35.8	31.2	30.5	22.5	30.8
Upper secondary(a)	36.7	30.7	27.3	23.2	30.2
Lower secondary	27.5	38.1	42.2	54.3	39.1
United States					
Tertiary	39.3	38.6	39.7	33.2	38.1
Upper secondary(a)	47.5	49.8	49.4	50.4	49.2
Lower secondary	13.1	11.6	10.9	16.4	12.7
Difference(b)					
Tertiary	-3.5	-7.4	-9.2	-10.7	-7.3
Upper secondary (a)	-10.8	-19.1	-22.1	-27.2	-19.0
Lower secondary	14.4	26.5	31.3	37.9	26.4

(a) Includes post-school non-tertiary qualifications.
(b) Percentage points.
Source: OECD Labour Force Statistics database; the author's calculations.

Educational attainment is only a proxy for the stock and accumulation of human capital in an economy. The ability to use particular skills and knowledge in the production process, not merely acquiring them, is what really matters for productivity and income. This is particularly important when inferring policy prescriptions from analysis that links differences in human capital per worker and GDP per capita. Education policies that aim to raise output in the economy should focus as much on incentives to use skills and knowledge as merely to acquire them.

Increasing educational attainment might particularly spur productivity when incentive structures in the economy promote innovation. An economy that encourages innovation is more likely to reward higher education than one that is not conducive to innovation. Unfortunately, the available measures of innovation are even more nebulous than the measures of human capital.

Innovation can take many forms. For tractability, empirical analyses often focus on business sector R&D intensity and patents as proxies for innovation. However, for a small open economy such as Australia, making effective use of ideas generated overseas may also be important. For example, while Australia is not a large producer of the information and communication technologies (ICT), Australia is one of the leading economies in the OECD in using ICT to achieve MFP gains (Treasury 2003).

Product and labour market policies and the productivity gap

After stagnating during the 1980s, Australia's labour productivity accelerated during the 1990s, outpacing the 'new economy' of the US (Table 2). Australia's productivity has continued to grow strongly in the current decade while the productivity growth rate in the US has increased since 2000 (see Box 1).

Table 2: Drivers of labour productivity growth in Australia and the US (1985-2004)

	Australia			United States		
	Annual average growth in:			Annual average growth in:		
	Labour productivity	GDP	Hours worked	Labour productivity	GDP	Hours worked
1985-90	0.1	3.5	3.4	1.3	3.3	1.9
1990-95	2.2	3.2	1.0	1.1	2.5	1.3
1995-2000	2.3	3.9	1.5	2.1	4.1	1.9
2000-04	2.2	3.4	1.2	2.9	2.5	-0.4

Source: GGDC and The Conference Board, January 2005.

This section considers how product and labour market policies affect the Australia-US productivity gap. The impact of the structural reforms of recent decades on the productivity gap is discussed first. The issue of whether further changes to Australia's product and labour market regulations might affect the Australia-US productivity gap is considered next.

Acknowledging various shortcomings in data and specifications of models, a survey of existing literature suggests that the productivity gap can be narrowed by as much as one-sixth by further changes to Australia's product and labour market regulations. While this might not appear to be large in terms of the productivity gap, if Australia had similar product and labour market regulations to the US, GDP per capita might have been as much as $1,300 higher in 2002.

Box 1: Is Australia's productivity falling behind that of the US?

Australia's labour productivity growth rate has been lower than that of the US in recent years, but Australia has achieved a higher MFP growth rate than the US since 1990 and in the data to 2002 this shows no sign of slackening (Table 3). This suggests that the recent widening of the labour productivity gap does not reflect a structural fall in Australia's productivity relative to the US.

Table 3: MFP growth in Australia and the US (1985-2002)

	Using national price indices for ICT goods		Using 'harmonised' price indices for ICT goods	
	Australia	US	Australia	US
1985-90	0.3	0.8	0.3	0.8
1990-95	1.4	0.8	1.4	0.8
1995-2000	1.5	1.3	1.5	1.3
2000-02	1.6	1.3	1.7	1.3

Source: The OECD productivity database, December 2004.

Australia's labour productivity was 81 per cent of that of the US in 2004, compared with 85 per cent in 2001. The recent widening of the productivity gap largely reflects the different stages of the business cycle in the two countries, with Australia recording stronger employment growth on average over this period.

Table 2 above shows that the recent widening of the Australia-US labour productivity gap is largely due to a rapid increase in labour productivity growth in the US, rather than a sustained slowing in Australia's productivity growth. The acceleration in US labour productivity between 2000 and 2004 has been accompanied by a 1.6 per cent fall in total hours worked. Hours worked per worker in the US fell by about 3.3 per cent in this period, more than offsetting a 1.7 per cent increase in total employment.

The weakness in the US labour market followed the 2001 recession. While it was one of the mildest recessions on record in terms of output, in labour market terms it was one of the worst since the Great Depression (Kennedy and Harris 2004). The unusually weak US labour market conditions accompanied the post-2000 labour productivity acceleration.

Structural reforms and the productivity gap

Australia's productivity revival since the early 1990s occurred despite a general slowing in labour productivity growth across the OECD, suggesting that it was largely due to the easing of domestic constraints on productivity growth. Australia's productivity revival can be conceptualised as consisting of three elements: an outward shift of the steady-state relative level of productivity; faster convergence to that level; and, an outward movement of the global technological frontier.

Policy settings affect a country's steady-state relative level of productivity. Alesina et al (2003) suggest that regulatory reforms, especially those liberalising entry, are likely to spur investment. Nicoletti and Scarpetta (2003) find that in countries with lower entry barriers and fewer state controls, firms adopt best-practice technologies more quickly. In Australia's case, policy settings changed dramatically through a series of broad and deep macroeconomic and microeconomic reforms during recent decades.

Key macroeconomic reforms include: liberalising Australia's foreign exchange regime; a medium-term inflation target through an independent central bank; and adopting a fiscal policy that achieves budget balance over the economic cycle. Key microeconomic reforms include: liberalising Australia's foreign trade, foreign investment, financial markets and workplace relations regimes; tax reform, including reforms of the indirect tax system and targeted incentives to work and save; corporate law reform; and a broad-ranging structural reform agenda.

These reforms are likely to have increased Australia's steady-state relative level of productivity. Further, the ICT-related innovations have probably resulted in a faster outward movement of the global technological frontier since the mid-1990s. These 'new economy' innovations may have also increased Australia's steady-state relative level of productivity by removing some of the constraints that geographic and historical context place on productivity.

There is a broad agreement that the reforms spurred the productivity revival witnessed since the 1990s. Productivity Commission (2005) modelling on the economy-wide impact of competition policy suggests that observed productivity and price changes in selected infrastructure industries have boosted Australia's GDP by 2.5 per cent. The OECD's latest economic survey of Australia notes that 'competition policy and other microeconomic reforms have played a central role in Australia's productivity surge'.

Labour and product market regulations and the productivity gap

Ongoing attention to structural reform should help continued growth in Australia's productivity over the medium term. Since 1990, Australia's labour productivity has grown by about 2 per cent per year. According to Bernanke (2005), future annual growth in labour productivity of about 2 to 2½ per cent probably represents a good baseline assumption for the US over the medium term. The issue of whether a realignment of Australia's product and labour market regulations to the US stance will help Australia achieve faster productivity growth than the US is discussed below.

Product market regulations

There have been a number of attempts to estimate the effects of product market regulation on output. In a much-cited study, Scarpetta and Tressel (2002) find that

further deregulation of Australia's product market would reduce Australia's MFP gap with 'the frontier economy' by 7.5 per cent.

The authors compute the 'frontier' by aggregating over industry-level technology leaders. Different countries are technological leaders in different industries, and no individual country is actually the frontier economy. This makes it difficult to use the authors' result to determine whether additional changes to Australia's product market regulations would further narrow the productivity gap between Australia and the US.

Table 4 suggests that Australia's product market regulations are already quite similar to those in the US. Even if the US is assumed to represent the 'frontier economy', an overestimate of the US level of efficiency, the Scarpetta and Tressel (2002) estimates suggest substantial reforms of Australia's product market regulations would narrow the productivity gap by around 1.5 percentage points.

Table 4: Product market regulations in Australia and the US

(Scale of 0-6 from the least to the most restrictive)				
	Australia		US	
	1998	2003	1998	2003
Economy-wide product market regulations	1.3	0.9	1.3	1.0
State control	1.4	0.6	1.4	1.2
Barriers to entrepreneurship	1.4	1.1	1.5	1.2
Barriers to trade and investment	1.0	0.9	1.1	0.7

Source: Conway, Janod and Nicoletti (2005).

However, Australia's regulatory stance in the product market is already quite liberal. Along with the UK, Australia's economy-wide product market regulations were the least restrictive in the OECD in 2003 (Conway, Janod and Nicoletti 2005). While this may mean that more deregulation may not spur productivity by as much as past reforms, it could nonetheless deliver a worthwhile increase in living standards.

Labour market regulations[3]

Studies aimed at estimating the effects of labour market regulations typically focus on labour market outcomes such as the unemployment rate. However, labour market regulations, particularly employment protection legislation, can also affect productivity.

Gust and Marquez (2002) point to a potential link between employment protection legislation and the productivity gap. According to their model, more restrictive employment protection legislation in Australia (Table 5) leads to slower adoption of

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3   This paper was finalised prior to the recent Australian Government announcement of further workplace relations reforms.

new technology, and a widening of the Australia-US productivity gap. This suggests that one area where further labour market deregulation and workplace relations reform can bring productivity improvements is through technology adoption.

Table 5: Employment protection legislation in Australia and the US

(Scale of 0-6 from the least to the most restrictive)	Australia		US	
	Late 1990s	2003	Late 1990s	2003
Regular employment	1.5	1.5	0.2	0.2
Temporary employment	0.9	0.9	0.3	0.3

Source: OECD Employment Outlook 2004.

How big might the impact of restrictive employment protection legislation be for Australia? Gust and Marquez (2002) link labour productivity growth to ICT adoption, and ICT adoption to employment protection legislation. Using their results suggests that if Australia were to substantially deregulate the labour market by removing all employment protection legislation, the annual labour productivity growth rate would be about a quarter of a percentage point higher.

Any empirical link between ICT adoption and productivity depends on how ICT adoption is measured. As Bernanke (2005) notes:

> … to realize the benefits of its ICT investments, Walmart had to reorganize work assignments, retrain workers, develop new relationships with suppliers, and modify its management systems. Although investments in intangible capital are (for the most part) not counted as capital investment in the national income and product accounts, they appear to be quantitatively important.

Scarpetta and Tressel (2002) consider the impact of employment protection legislation on MFP. They find that a substantial liberalising of employment protection legislation would reduce Australia's MFP gap with 'the frontier economy' by 10.8 per cent. This implies that, subject to the above caveats, reforming Australia's employment protection legislation may reduce the productivity gap by about 2 percentage points, with likely significant beneficial impacts on living standards.

Possible effects of changing product and labour market regulations

Acknowledging the difficulties involved in estimating the impact of potential reforms on the Australia-US productivity gap, on balance the estimates outlined above suggest that further deregulation of Australia's product and labour markets might narrow the gap by as much as one-sixth.

The benefits of narrowing the productivity gap by this magnitude could be substantial in terms of increased income. For illustrative purposes, a one-sixth reduction in the

productivity gap with the US in 2002 would have raised Australia's GDP per capita by about $1,300.

Geography, history and the productivity gap

The reforms implemented over the recent decades have resulted in a gradual narrowing of Australia's productivity gap with the US. Nonetheless, a sizeable productivity gap remains. The persistence and size of the gap suggest that there are more than just differences in policy between the two countries that determine differences in GDP per capita. There might be something in the geographic and historical context of the Australian economy that inhibits its ability to achieve the US level of productivity.

The Australian economy operates in a particular geographic and historical context. In contrast to the US, Australia is a long way from the centre of world economic activity, and is also a geographically large country with a relatively small population. This section discusses these contextual factors. There are strong reasons to believe that part of the Australia-US productivity gap is likely to be explained by geography and history. Nonetheless, there remains much scope for future research to measure the importance of these factors on the productivity gap.

Australia is remote from the majority of the world's economic activities. Indeed, it is the second most remote economy in the OECD, just ahead of New Zealand. This is despite the recent rapid economic development in Asia. From the 1950s to the 1990s, the proportion of world GDP within 12,000 kilometres of Sydney increased from about 26 per cent to nearly 38 per cent (Ewing and Battersby 2005). In comparison, over 85 per cent of world GDP was within 12,000 kilometres of New York in both the 1950s and the 1990s.

This remoteness affected Australia's economic history compared with that of the US. The US was fighting its War of Independence long before large-scale settlement commenced in Australia. Australia's population was about 1.8 million in 1870, when with over 40 million people, the US was already larger than most other countries in the world (Maddison 2001). Even today, Australia's population is only about one-fourteenth of that of the US, even though Australia is nearly four-fifths of the US in terms of area.

Partly as a result of nineteenth century history, Australia's population is concentrated in a few large cities situated hundreds of kilometres apart. Cities are much more closely situated in the US. As a result, while the average Australian lives in cities of similar size to their US peers, the US has nearly eight times as many cities of substantial size as Australia in a given area. McLean and Taylor (2001) provide a vivid

illustration — no two Australian cities with a population of over one million people are within 600 kilometres of each other, compared with California, whose 34 million people live mainly between San Diego and Sacramento, a distance of only around 800 kilometres.

The dispersed nature of the population discourages labour mobility within Australia. Australians are only half as likely to move interstate as their US peers (ABS 2001 and Franklin 2003). Further, almost half of the people who move interstate in the US move between the broad US regions: North East, South, Mid-West or West. In contrast, Australians typically do not move long distances. Between 1991 and 1996 the median distance moved by Australians was about 16 kilometres (Bell and Hugo 2000).

Differences in geography and history mean that Australia misses many of the benefits of proximity that accrue to the US. These benefits include the economies of scale, intensity of competition, and low transportation costs that are available in more densely populated markets. As a result, these factors might lower Australia's steady-state relative level of productivity.

Economic growth literature suggests that over the long term, geography is a major underlying determinant of economic prosperity (Sachs and Warner 1997). One implication of this literature is that being an island or being remote is likely to lower a country's income, other things being equal. Redding & Venables (2002) suggest that Australia's GDP would have been nearly 7 per cent higher if, rather than being an island, it had land borders with significant trading partners. Concentrating specifically on the Australia-US productivity gap, Battersby (2005) finds that nearly two-fifths of the gap may be explained by Australia's remoteness.

The geographic and historical factors might shape the structure as well as the size of an economy. Some industries form a bigger part of the overall economy in Australia than in the US. To what extent are the overall productivity differences related to industry structures? To explore this question, industry structure is defined as the distribution of total hours worked between industries using the data from the Groningen Growth and Development Centre 60-industry database.

To determine the effect of industry structure on Australia's productivity relative to the US, US shares of hours worked in each industry are multiplied by Australian labour productivity in those industries. This results in a productivity level that is very similar to that with Australia's existing industry structure. That is, Australia's industry structure does not appear to make a major difference to the aggregate productivity gap. This suggests that the productivity gap between the two countries arises mainly from productivity levels within industries.

Analysis at the industry level is subject to considerable uncertainty due to significant data issues. It suggests that Australia's productivity level relative to the US differs markedly across industries (Chart 3). Australia's mining sector for instance is much more productive than that of the US, reflecting Australia's abundant natural resource endowment. On the other hand, some of the service sectors in Australia have measured productivity levels that are much lower than their US counterparts.

Chart 3: Australia's productivity in selected industries relative to the US
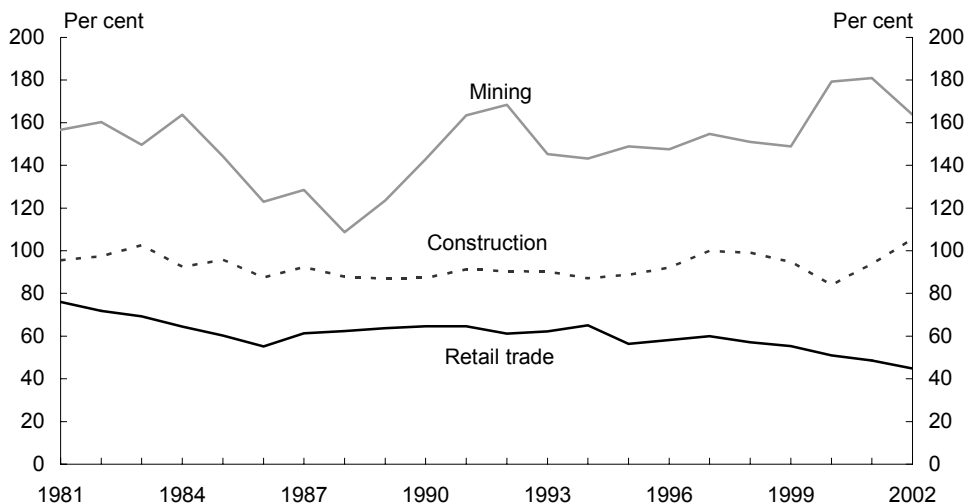
Source: GGDC and The Conference Board, January 2005; the author's calculations.

Retail trade provides an example of a sector where Australia's productivity level might be lower than that in the US as a result of geography and scale. The US retail trade sector has experienced rapid productivity improvement since the mid-1990s. This productivity surge can be attributed almost entirely to the entry of more productive firms that displaced much less productive existing retailers (Foster, Haltiwanger and Krizan 2002). The entering firms were usually large discount operations — the 'big-boxes' like Wal-Mart. These stores are more productive because of their size, which allows them to exploit economies of scale, efficiently use warehousing, better manage inventories and implement other innovative operation practices (Gordon 2004).

Australia's retail trade sector witnessed substantial productivity improvement in the 1990s. Regulatory reforms, adoption of new technology, and competition and rationalisation in the industry drove the productivity improvement (Johnston et al 2000). This rationalisation notwithstanding, Australian retailers have not adopted the 'big-box' format to the same extent as the US. Further, despite improvements over the 1990s, Australia's productivity level in the retail trade sector has fallen relative to the US. It may be that Australia's geography and size make the

integration of supply chain and better inventory management harder, and make the adoption of the 'big-box' format less profitable.

One way to explore the link between the contextual factors and the productivity gap empirically is to focus on industry- and firm-level data. Another way is to look to the burgeoning literature on the link between economic geography, market structure and policy choices (Syverson 2004, Winters and Martins 2004, Evans and Hughes 2003 are some examples of this literature). This literature does not specifically focus on Australia, but analysing their implications will illuminate how contextual factors affect market structure and productivity.

Concluding remarks

Australia's productivity gap with the US explains the bulk of the Australia-US income gap. This paper surveyed various explanations for the Australia-US productivity gap, and found that the productivity gap can at least in part be explained by a combination of: differences in human capital as represented by historical educational attainment; differences in product and labour market policy settings; and, the geographic and historical context of the Australian economy. Differences in physical capital per worker and industry structures do not appear to be primary explanations for the productivity gap. Nonetheless, there remains much scope for future research to measure the importance of these factors on the productivity gap. Future research will also benefit from using industry- and firm-level data.

Further research into the causes of the productivity gap will provide tangible benefits to policymakers. Measuring the importance of the difference in the average level of human capital on the productivity gap may assist in shaping education policy. Better estimates of the impact of workplace relations reform on the gap may illuminate a benefit of a flexible labour market that is not usually highlighted. Finally, a better understanding of the way geography and history affect the productivity gap will help illuminate how much further productivity in the Australian economy may be able to catch up with that in the US.

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Possible links between household debt, demand for imported goods and Australia's current account deficit

Treasury submission to Senate Economics References Committee public inquiry

12 March 2005

Overview

Australia has run a current account deficit for all but two of the past 50 years. Since the early 1980s it has generally fluctuated between 3 and 6 per cent of GDP, in line with the business cycle and swings in world commodity prices.

The current account balance reflects the saving/investment balance within the Australian economy. In contrast to previous decades, the government sector is close to balance. The corporate sector is also close to balance, with investment being funded from strong profits. The current account deficit therefore reflects the excess of households' investment over their saving. This is being indirectly financed from overseas, through the banking system.

Households have spent in excess of income, in part because increased house prices have led to increased household wealth. The rise in house prices reflects an adjustment to sustained low inflation and interest rates, among other factors. However, activity in the housing market can not be sustained at the pace seen in recent years. As the housing market cools, growth in consumer spending should ease and household saving rise, resulting in a tendency for the current account deficit to fall, everything else equal.

The increase in household debt also partly reflects the deregulation of the financial system over the past two decades. This has shifted the regulatory focus in the financial sector from a model based on restricting market forces to one based on minimum prudential standards, increasing disclosure and improving market conduct.

Deregulation has been an important driving force in providing a competitive stimulus to the financial sector, improving its efficiency and performance. Consumers have also benefited from improved product choice and reductions in borrowing costs.

The current account

Introduction

The current account of the balance of payments comprises the 'trade balance' or 'balance on goods and services' (exports less imports) and the 'net income balance' (interest, dividends and transfers received by Australians less interest, dividends and transfers paid to foreigners).

Australia has experienced a deficit on the current account for nine years in every ten since European settlement, and for all but two of the last 50 years. By definition, it has also run a surplus on the capital account in all these years, attracting net capital inflow

which indicates investment opportunities in Australia continue to be attractive to overseas investors.

Over the past twenty years, the current account deficit (CAD) has fluctuated between, broadly, 3 and 6 per cent of GDP (Chart 1). Most of the fluctuation has been a reflection of changes in the trade balance, since the net income deficit has been relatively stable, or slowly declining, since its sharp run up in the mid-1980s.

Chart 1: Current account balance as a per cent of GDP
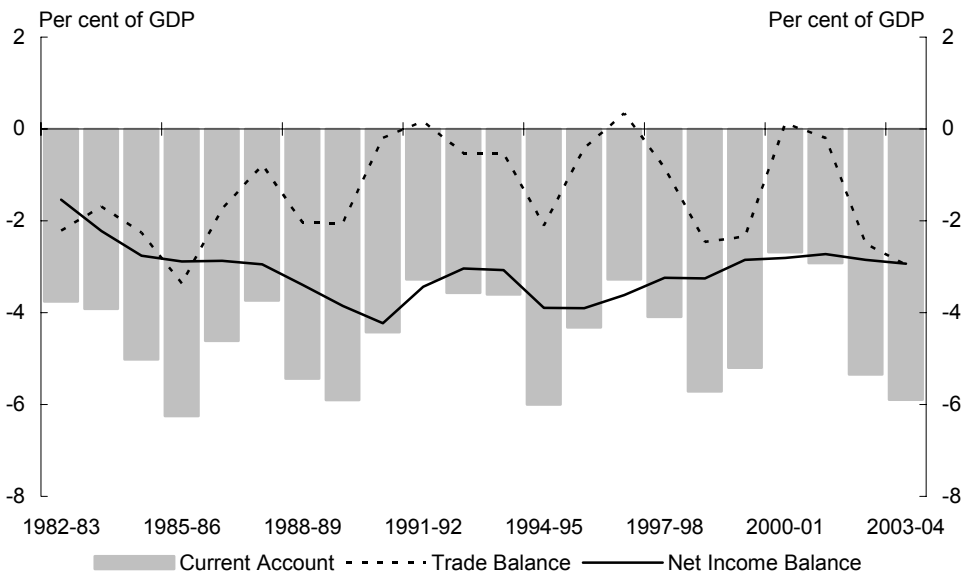
Source: Australian Bureau of Statistics cat. no. 5302.0 and 5206.0.

The trade balance tends to move with the economic cycle. When domestic demand grows faster in Australia than in the rest of the world, import volumes tend to rise more than export volumes and so the trade deficit becomes larger (as has happened recently). During the recession of the early 1990s (and the slowdown around 2000), import volumes were more subdued and the trade deficit was correspondingly smaller. Fluctuations in the CAD are not a bad thing. They are a means by which Australia smoothes consumption in the face of income shocks, such as the Asian crisis. That is, the CAD, like the exchange rate, acts as a buffer or shock absorber between domestic demand and global developments.

Imports consist of consumption goods for households; intermediate and capital goods that Australian firms use to produce goods for domestic sale and export; and services (a large component of which is spending by Australian tourists abroad). Import volumes have grown strongly recently. Growth in export volumes has been weak, despite a strong world economy.

The other major influence on the trade deficit is the 'terms of trade', that is the ratio of export prices to import prices. As Australia is a net exporter of commodities and a net importer of manufactures, the terms of trade tend to rise when commodity prices rise, which is generally when the world economy is buoyant. The floating exchange rate buffers the effects of swings in the terms of trade on the economy to some extent, as it tends to appreciate when commodity prices are rising and depreciate when commodity prices fall.

The deficit on the net income balance largely reflects past current account deficits. These have been funded by borrowing from the rest of the world, or by selling assets. As a result, the rest of the world's holdings of Australian assets exceed foreign assets held by Australians. The interest and dividend flows on these net foreign liabilities generally lead to an income deficit.

About half of Australia's foreign liabilities are initially issued in currencies other than the Australian dollar (particularly the US dollar and euro). Firms and banks which issue these liabilities in foreign currencies typically 'hedge' their currency exposure by using the Australian dollar swap market to convert their liabilities into Australian dollars. Accordingly, the bulk of Australia's foreign liabilities are effectively in Australian dollars. Firms with foreign liabilities that do not use currency hedges will typically hedge their currency exposure in indirect ways, like matching the currency denomination of particular assets and liabilities. Therefore, depreciation of the Australian dollar has minimal direct impact on the liabilities of Australian firms and financial institutions. The story about assets is different. Because most of Australia's foreign assets are denominated in foreign currencies, depreciation of the Australian dollar will increase the value of these assets in Australian dollar terms.

The current situation

Chart 1 shows that the current account deficit is at the high end of the historical range. This reflects some offsetting factors. There is currently very strong demand for our resource exports. This is reflected in high prices for these exports, but so far there has been little rise in export volumes. This is partly due to firms underestimating the strength of global demand and the lags associated with expanding capacity. Furthermore, the diversity of ownership of the various linkages between mines and ships has made coordination of improvements to transport and port facilities difficult. Nevertheless, there is a substantial amount of investment currently under way, which should allow significant expansion in these exports in coming years. The volume of manufactures exports has been weak for some time. This reflects maturing of the sector, the appreciation of the Australian dollar, growing sophistication of Asian competitors and perhaps some diversion of production as a result of high domestic demand.

Strong domestic demand means that spending on both domestically produced goods and imports is high.[1] Domestic demand is being supported by strong growth in incomes and wealth. While real GDP expanded by 1½ per cent through 2004, the rise in the terms of trade meant that real national income grew by almost 3 per cent (Chart 2). Increases in household wealth, and a greater willingness and ability for households to take on debt, have allowed spending to outpace incomes in recent years. In addition to domestic demand, the appreciation of the exchange rate during 2003, the ongoing price falls for computers and other electronic goods and the impact of Asian producers on manufactures prices have all acted to lower the price of imports, making them more attractive to domestic buyers.

Chart 2: Real production and income
(percentage change through the year)
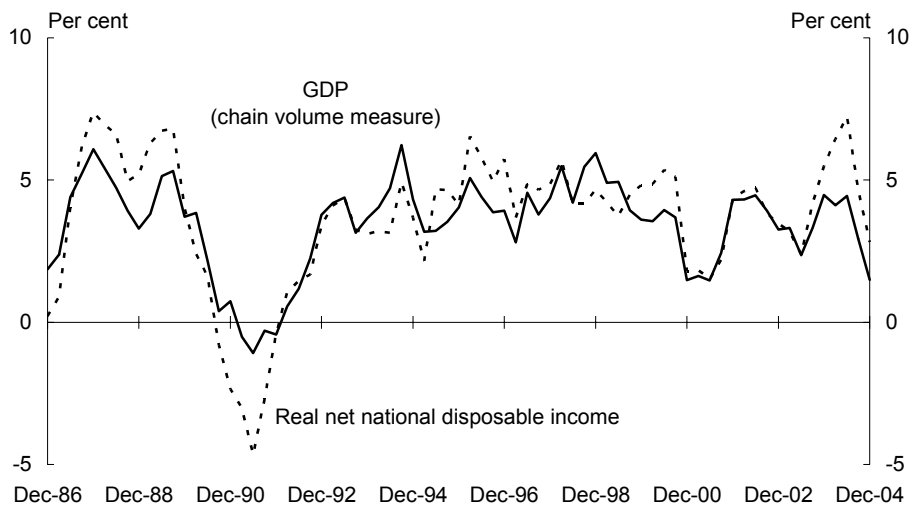
Source: Australian Bureau of Statistics cat. no.. 5206.0.

The current account from a saving/investment perspective

While the CAD is most commonly discussed from a trade perspective, it is best understood within a saving/investment framework. The first three panels of Chart 3 show 'net lending' (when saving exceeds investment) or 'net borrowing' (when saving falls short of investment) by government, corporations and households in Australia. The final panel is the current account balance (which can be thought of as 'net borrowing' by Australia from the rest of the world). As they are based on national accounting identities, the numbers in first three panels must always sum to the current account balance.

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1   An article in the Summer 2004-05 Treasury Economic Roundup describes recent trends in imports in more detail.

Possible links between household debt, demand for imported goods and Australia's CAD

Chart 3: Net lending
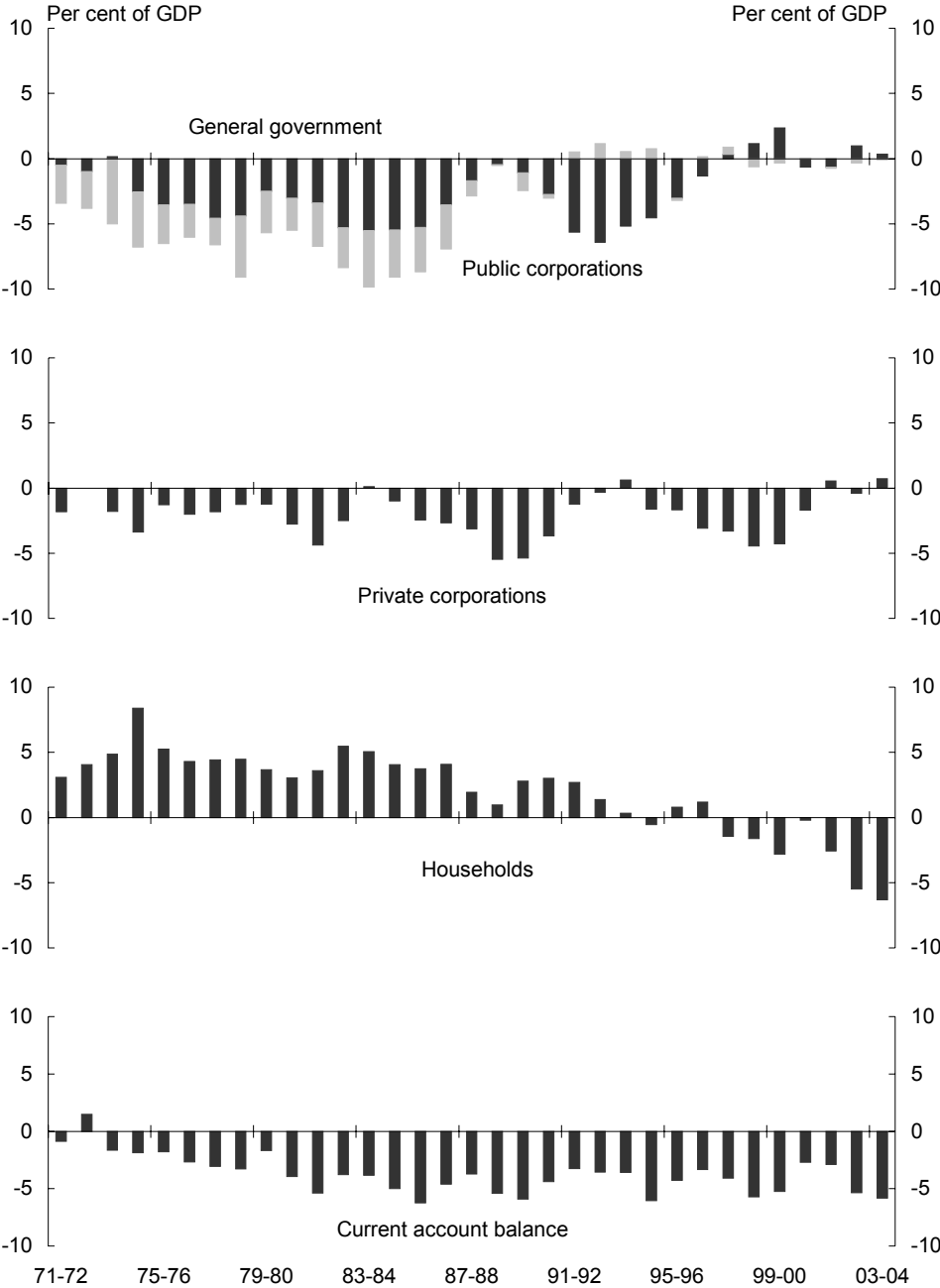
Source: Australian Bureau of Statistics cat. no. 5204.0, 5302.0 and Treasury (original data).

At present, corporations are small net lenders. While business investment is solid, high corporate profits mean that corporate saving is also high.[2] In the 1970s and early 1980s the public (government and public corporations) sector was consistently a large net borrower. But in recent years, the federal budget has been in surplus, consistent with the medium-term fiscal strategy. Combined with aggregate budget outcomes close to balance in the state and local government sector, this means the general government sector as a whole is a small net lender. Furthermore, after the series of privatisations that occurred over the 1980s and 1990s, public corporations now play only a small role in the economy. The government sector is therefore not a contributor to the current account deficit.

The counterpart to the current account deficit in recent years is the net borrowing by households. The household sector has been borrowing (indirectly, via the banking system) from the rest of the world to fund spending in excess of income.

The household sector

Household investment and saving

Over the past 15 years the household sector has changed progressively from being a net lender to the rest of the economy to being a net borrower. This reflects both an increase in household investment and a large trend fall in household saving.

Household investment has been very strong over recent years.[3] Strong population growth and household formation have provided solid underpinnings for the housing market.[4] Interest rates have been low and stable. Over a third of the demand for housing finance over recent years has come from investors, mostly individuals, attracted in large part by the strong gains in house prices observed until recently. However, forward indicators of dwelling activity are consistent with anecdotal evidence of an easing in the housing market.

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2 Some commentators have attributed the rising current account deficit to a surge in business investment, pointing to real business investment being a high proportion of real GDP. However, as there has been a significant fall in the relative price of investment goods, nominal investment is not that high as a proportion of nominal GDP, and it is nominal investment, that is actual expenditure, that matters for an analysis of the current account.

3 In this context 'investment' refers to capital expenditure, such as building a new house or extending an existing home, not purchases of property or financial assets. See 'Recent developments in the Australian housing market', Treasury Economic Roundup, Summer 2003-04, for background information.

4 Furthermore, over the past two decades the average floor area of new dwellings has increased by over a third.

Household saving is most commonly presented relative to household net disposable income, as the 'household saving ratio' (the lower, solid line in panel (a) of Chart 4). This ratio has been declining since the late 1970s. Since mid-2002, the household saving ratio has been negative — on this measure, households have been spending more than their income (panel (b)).

It is important to understand the limitations of the household saving ratio as a measure of household saving. First, the household saving ratio is prone to revision, as it is calculated as a residual item between household income and consumption, and hence is subject to revisions to either of these aggregates. In one extreme case, the March quarter 1996 National Accounts reported a household saving ratio of 0.1 per cent, which has subsequently been revised up to 5.8 per cent. Second, capital gains are not included as income (but payments of capital gains tax detract from income) and households almost certainly regard unrealised capital gains as a form of saving.[5] Third, an estimate of depreciation on dwellings is subtracted from national accounts measures of household incomes, although this is not a cash outlay for households in reality.[6] As depreciation is mechanically assumed to rise with the cost of building houses, this imputed subtraction has been growing. Fourth, the definition of 'households' includes unincorporated enterprises. Some of these are family farms, whose income varies with seasonal conditions, making the saving ratio more volatile. There has also been a trend towards small businesses incorporating, and so leaving the 'household sector'. If they had been net savers, this would be pulling down the household saving ratio. Despite these problems, the broad conclusion that households are saving proportionately less of income now than in the past is likely to be correct but should not be regarded as surprising.

A rise in household debt represents a rational response to the deregulation of the financial system, which allows consumers to smooth their consumption more efficiently over their life cycle. Lower inflation, leading to lower nominal interest rates, has also made it easier for households to borrow more.[7] This effect has been amplified by greater competition in the home lending market, which drove down mortgage

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5   The ABS have done some work on estimating the size of the capital gains effect on income and saving; see Table 48 of *Australian System of National Accounts*, (Cat. No. 5204.0), November 2004.
6   Comparing the two lines in panel (a) of Chart 4 shows that it is only this imputed depreciation that renders the household saving ratio negative.
7   Most home loans in Australia are 'credit foncier' loans where most of the initial repayments go on paying interest but towards the end of the loan most is repaying principal. Typically the maximum size of a loan is determined by the resulting repayment-to-income ratio.

interest rates further.[8] The increased ability of households to borrow probably helped to drive up house prices, thereby increasing the amount households needed to borrow.
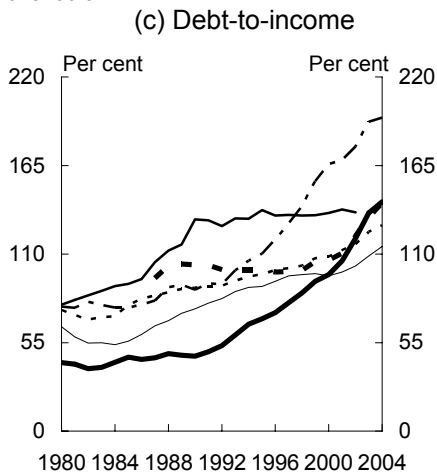
Chart 4: Households
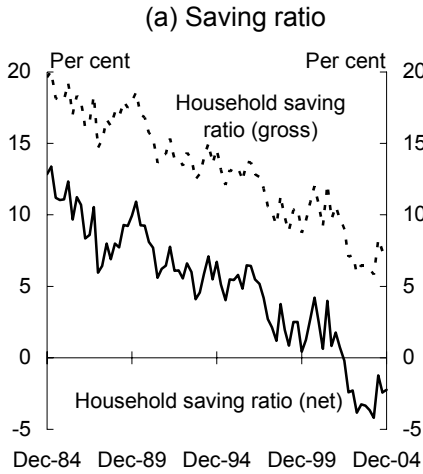
(a) Saving ratio

Source: Australian Bureau of Statistics cat. no. 5206.0.

(b) Consumption and income

Source: Australian Bureau of Statistics cat. no. 5206.0.

(c) Debt-to-income
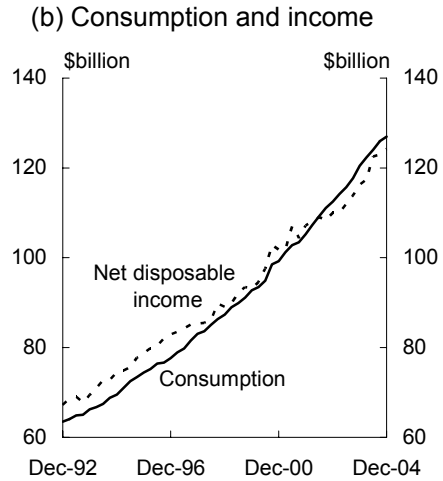
- · · · · · US
- — · — · Netherlands^
- ——— Canada^
- ——— Japan^+
- —— Australia
- – – – UK^

^ Includes unincorporated enterprises
+ Income is after tax and after the deduction of interest payments
Source: RBA.

(d) Interest payments-to-income
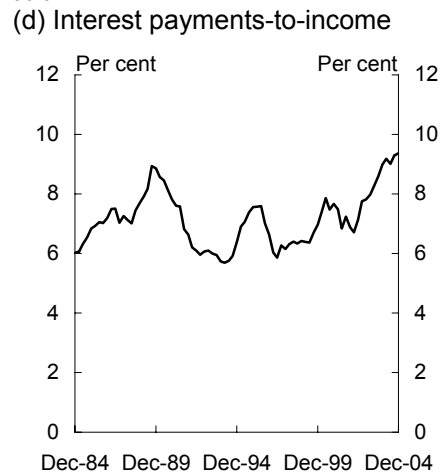
Source: Australian Bureau of Statistics cat. no. 5206.0.

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8   The Reserve Bank suggests greater competition was responsible for around 2 percentage points of the 8 percentage point reduction in average mortgage interest rates between the second half of the 1980s and the period 1998-2002. (*RBA Bulletin*, March 2003)

Household balance sheets

Household debt has increased substantially relative to income in Australia, as it has in many other countries whose financial systems were deregulated and where (real and nominal) interest rates have fallen (Chart 4, panel (c)).[9] Whereas in the 1980s Australian households had low debt relative to income by international standards, they are now similarly indebted, with an average debt of around 150 per cent of annual income. The increase in debt means that, despite lower interest rates, interest payments now take up a higher proportion of income compared with the past decade (Chart 4, panel (d)).

It is important to appreciate that these are average figures across all households. For example, only a third of households have a mortgage, and the average debt-to-income ratio for these households will be higher. Treasury analysis suggests that older households have accounted for an increasing proportion of dwelling purchases. These households are likely to be better placed to meet loan repayments.[10] Furthermore, other studies suggest household debt is mostly being borrowed by households with higher incomes who are better placed to bear it (Chart 5).[11]

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9   For further information, see G. Debelle 'Macroeconomic implications of rising household debt', *Bank for International Settlements working paper*, no 153, June 2004.
10 For further information, see the appendix on 'Dwelling ownership as part of Australian household portfolios', in the Autumn 2003 issue of the Treasury Economic Roundup.
11 Information on the distribution of debt is collected in the Household Income and Labour Dynamics in Australia Survey. Some results from the survey are summarised in M. Kohler, E. Connelly & K. Smith, 'The composition and distribution of household assets and liabilities: evidence from the 2002 HILDA survey', *Reserve Bank of Australia Bulletin*, April 2004.

Chart 5: Household gearing (ratio of debt-to-assets) by income
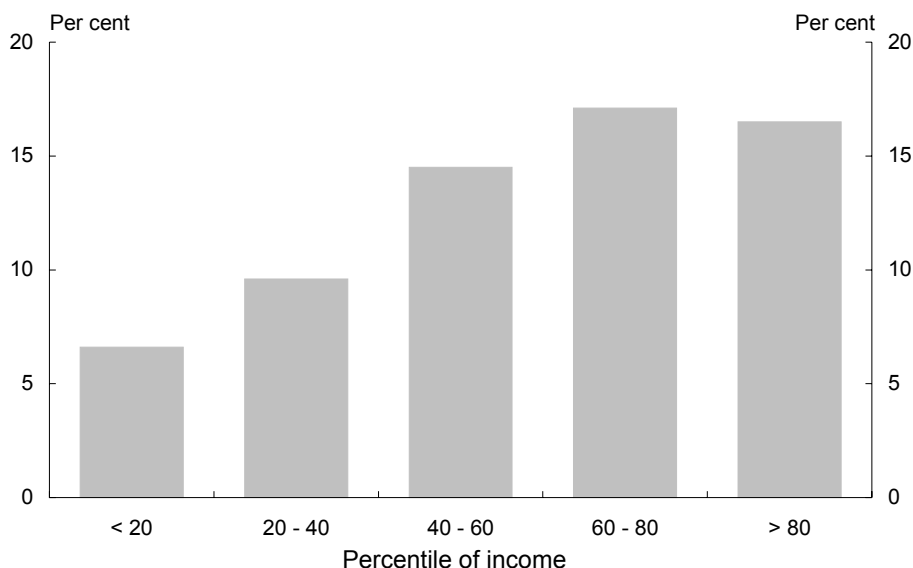
Source: Household Income and Labour Dynamics in Australia survey.

Assessing whether lower household saving and increased borrowing should raise concerns requires placing the debt in the context of household balance sheets. Household gearing (debt/assets) has been steady in recent years. For every dollar of debt, households have around $2 in financial assets and more than $6 in total assets.

There is so far little evidence that households as a whole have become overextended in terms of debt. As the Reserve Bank of Australia notes in its February 2005 statement on monetary policy, 'at this stage the servicing burden does not appear to be constraining households, with indicators of financial stress — such as loan arrears — remaining low.' However, the household sector is now more sensitive to shocks such as higher interest rates or lower income.[12]

The economic outlook and implications

The increased debt of the household sector is likely to make their consumption more sensitive to changes in (actual and expected) interest rates. The extent of the increase in sensitivity will depend on the distribution of the debt. For example, investors, some of whom are more highly geared, account for an increasing proportion of the housing market, and may react differently to owner-occupiers.

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12 See the discussion of risks in Statement 3 of Budget paper 1, *Budget Strategy and Outlook 2004-05.*

Interest rates have become less volatile than in the past as a result of the economy becoming more stable. Furthermore, as the Reserve Bank is aware that households now have more debt, it recognises that it needs smaller changes in interest rates to achieve a given effect on household spending.

Treasury is forecasting both unemployment and inflation to stay at low rates. If house prices were to fall more sharply than expected this could have implications for economic activity. Current information indicates, however, that the housing cycle is unwinding and, provided this continues in a measured way, this cycle will be muted compared with previous cycles. In part, this reflects the household sector continuing to be supported by favourable economic conditions with strong employment growth and high levels of consumer confidence.

As the housing market cools, growth in dwelling investment and consumer spending should ease and household saving rise, reducing the size of the current account deficit.

The changing role of regulation

Up until the 1980s, the Australian financial system was heavily regulated and restrictive. Interest rate controls were in place and loans were rationed and only available to the most credit worthy borrowers. Competition from foreign banks was restricted and the banking system was effectively closed to offshore transactions.

In 1979, the Government established the Campbell Committee to recommend changes to the regulatory structure of the financial system to promote efficiency and stability. These changes were the Government's first formal attempt at financial system reform and were followed by another formal reform programme in 1996 with the Financial System Inquiry (the 'Wallis Inquiry').

Through successive reforms over the 1980s and 1990s, the Government has shifted the focus of regulation from restricting market forces to a model based on minimum prudential standards, increasing disclosure and improving market conduct. In particular, regulations that undermined efficiency, such as interest rate controls and lending restrictions, have been removed. At the same time, prudential supervision has been strengthened to promote sound risk management practices by firms and provide for early detection and resolution of financial difficulties.

Importantly, these reforms do not involve a government guarantee over any part of the financial system. It remains the responsibility of the board and management of financial institutions to ensure that the financial promises made to consumers are kept. The reforms only seek to add an additional layer of protection to guard against market failure.

Benefits of financial sector deregulation

The reforms to financial regulation implemented over the past two decades have promoted competitive pressures across the financial sector. In particular, competition in markets, such as home and personal lending, has been enhanced by a number of changes. These include the entry of foreign banks into the Australian market and the establishment of specialist providers in the home lending market. These changes have lowered borrowing costs and improved access to credit, contributing to an increase in the level of household and business borrowing.
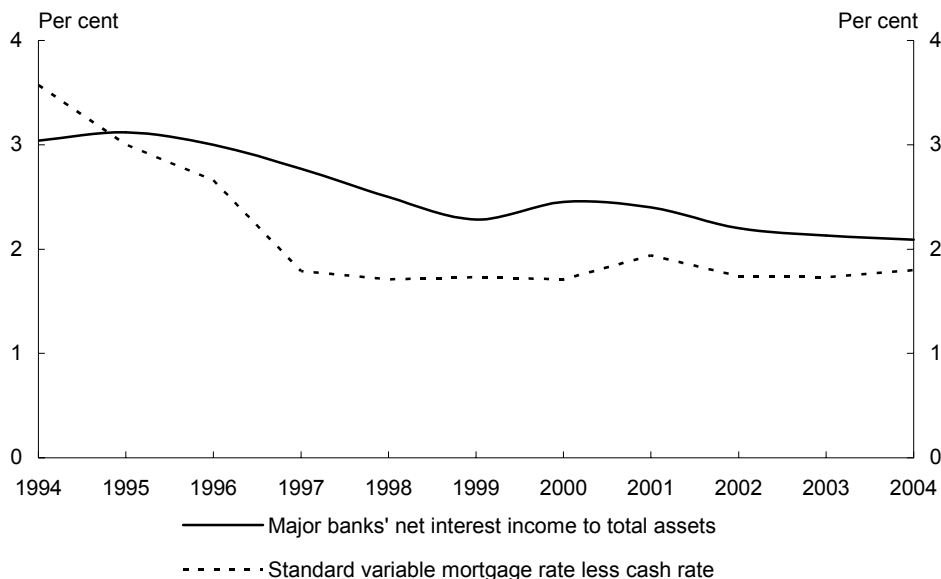
The increased levels of competition have contributed to gradual improvements in the efficiency and performance of the financial system. For instance, in the banking sector, prior to the 1980s, interest rate and maturity controls resulted in a pricing structure under which most retail payments and transaction services were provided free of charge. The costs of these services were offset against higher interest margins — the difference between what banks pay on deposits and other sources of funds and what they earn on loans. As a result of these controls, the banking system practised considerable cross-subsidisation among different products and customer groups, creating distortions in pricing signals.

More recently, the pricing of banking services (both fees and interest rates) has begun to reflect more closely the 'user pays' principle, with banks charging fees equivalent to 1 per cent of their assets since 1997 and interest rate margins reducing (see Chart 6). These changes have improved resource allocation as they more closely reflect the underlying cost and risk of providing banking services.

As Chart 6 shows, fierce competition across the financial sector has lowered the costs of finance, with bank interest rate margins falling considerably over the past decade. This trend has been most pronounced in the residential mortgage market where margins have fallen from 3.6 per cent in 1994 to 1.8 per cent in 2004, saving home buyers thousands of dollars in interest on their mortgages. The savings made by customers from a decline in interest rate margins have more than offset any rise in fees.[13]

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13 Bank fees are discussed in 'Banking fees in Australia', *Reserve Bank Bulletin*, May 2004.

Chart 6: Reduction in interest rate margins

Per cent   Per cent

——— Major banks' net interest income to total assets

· · · · · · Standard variable mortgage rate less cash rate

Source: RBA Bulletin Statistics F1, F4; KPMG, *Financial Institutions Performance Survey*, 1994 to 2004.

Increased competition has also provided institutions with an incentive to reduce their production costs. Operating expenses of the major domestic banks (as a proportion of total assets) have been gradually trending downward from just over 3 per cent of total assets in 1987 to below 2 per cent in 2004 (KPMG Financial Institutions Performance Survey 1987 to 2004).

Financial sector deregulation has also opened the way for a wider range of financial institutions to offer greater choice in services and products to customers. For instance, in 1980, deposit-taking institutions were the main source of home finance, offering around 26 types of mortgages. There were strict limits on the size of housing loans and a longstanding relationship with the bank was often a prerequisite for loan approval. Mortgage offset accounts and redraw facilities were not even considered. Today, consumers can choose from around 3,000 differentiated mortgage products offered by a range of suppliers. Delivery platforms have also changed, with electronic access points such as ATMs replacing the traditional branch network (see Table 1).

Table 1: Improvements in product innovation and choice

	1980	1997	2003
Types of cheque accounts	10	530	n.a.
Types of mortgages	26	1,800	3,000
Types of savings products	600	1,700	n.a.
Number of ATMs	25	8,796	20,899
Number of EFTPOS locations	0	201,932	446,111

Source: Australian Bankers' Association, 2004

Concluding comments on financial deregulation

Deregulation has significantly improved the efficiency and performance of the Australian financial system. Increased pricing efficiency in retail banking, for example, has improved resource allocation, while increased competition has provided institutions with an incentive to reduce their production costs. The outcome has been a reduction in interest rate margins and greater ease of access to credit. This has contributed to an increase in the level of household and business borrowing.

Structural fiscal indicators: an overview

Benjamin Ford[1]

The economic cycle affects a government's fiscal position. Several techniques have been developed to estimate the variation of budget aggregates arising from the economic cycle. These techniques are known as structural fiscal indicators and estimates are published semi-annually by both the IMF and the OECD, among others.

Significant assumptions about the economy's potential output level and the cyclical sensitivity of revenues are required to calculate estimates of the structural fiscal position. The arbitrariness of these assumptions limits the usefulness of structural fiscal indicators as a guide for policy in the short term. For these reasons, official estimates of the structural balance are not published by the Australian Government. However, measures produced by both the IMF and OECD suggest a structural improvement of Australia's fiscal position over the past few years.

Introduction

The economic cycle affects the government's fiscal position. The Government's fiscal strategy, which is set over a medium-term horizon, abstracts from such cyclical variations. The primary objective of the fiscal strategy is to achieve budget balance, on average, over the course of the economic cycle.

Several techniques have been developed to measure the variation of budget aggregates arising from the economic cycle. Chief amongst these techniques is the estimation of a structural fiscal indicator that attempts to identify the impact of the economic cycle on the fiscal position and subtract this effect from the actual budget balance. These indicators are subject to a number of methodological problems that limit their usefulness as a guide for policy at a point in time.

Estimates of the structural budget balance are published for most advanced economies in the IMF's *World Economic Outlook*. Estimates of the OECD's cyclically adjusted balance are published in its *Economic Outlook*. For the purposes of this article, it is assumed that the terms 'structural' and 'cyclically adjusted' have the same meaning.

The OECD and the IMF indicators are conceptually similar, although they adjust for the cycle in slightly different ways. The two estimates should yield broadly similar results, although in practice there can be considerable differences between them.

The purpose of this paper is to provide an overview of the indicators published by these organisations and to assess the extent to which they provide useful information about Australia's fiscal position.

The influence of the economic cycle — overview

Government expenditures and revenues tend to vary with the economic cycle. When output growth is running above trend, expenditure falls and revenue rises, relative to trend. Expenditure falls as, in general, when growth is higher there is less spending on unemployment benefits and other welfare programmes, while tax revenue rises through higher company profits, wages and consumer spending. When output growth is below trend, the converse applies. The Government's fiscal strategy, which aims for balance over the cycle, abstracts from such cyclical movements.

Structural fiscal indicators aim to adjust for the effects of the real economic cycle on the budget balance by identifying the extent to which budget aggregates are affected by the cycle. Conceptually, government budget aggregates in any given year reflect the net impact of structural components and cyclical components of the budget. The structural component refers to the fiscal position that is generated under 'normal' economic conditions, usually interpreted as a situation in which the economy is

operating at its maximum feasible non-inflationary output level given existing technology and production capacity. This level is known as the economy's potential level of output. When the actual level of output varies from potential there will be a cyclical component to the budget balance. The magnitude of this cyclical component will depend on the size of the deviation of the economy from potential and the responsiveness of expenditures and revenues to this deviation.

Estimating the cyclical component of the fiscal position therefore requires quantification of the size of the deviation of actual output from potential and the cyclical sensitivity of the budget aggregates. The result of this estimation is then subtracted from the actual budget balance to obtain the structural balance measure. A key input into this estimation is the calculated output gap, which is the difference between the actual level of output and the economy's potential level of output.

The interpretation of structural fiscal indicators is fairly straightforward. When the economy is assessed to be above its potential level, the structural budget balance will be less than the 'headline' budget balance (smaller surplus or a larger deficit). That is, part of the 'headline' balance reflects the impact of the economy operating temporarily above potential rather than the result of active decisions about revenue and expenditure. The converse applies when the economy is running below potential.

Government revenues in Australia are affected not just by swings in the real economy but also by any significant variations which might occur from time to time in the nominal economy due to, for example, swings in export commodity prices and the terms of trade. These variations affect incomes and hence the income or company tax base. However, existing structural fiscal indicators do not make any allowance for such effects, which can be quite large.

In light of the above, while the structural balance concept provides a general framework for thinking about the relationship between the economic cycle and the fiscal position, any empirical results must be treated with caution as they may give a misleading indication of the stance of policy. For this reason, the Government does not publish structural fiscal measures.

Construction of structural fiscal indicators

The structural budget balance is calculated by subtracting structural expenditures from structural revenues. Structural expenditures and revenues are obtained by subtracting their estimated cyclical components from their actual level. This process involves three main steps:

1.   estimation of potential output and the output gap;

2.   quantification of the cyclical component of expenditures and revenues; and

3.   subtraction of the estimated cyclical components from their actual levels.

These steps are examined in more detail below.

Estimating structural fiscal indicators

The first step in estimating structural fiscal indicators is to estimate the economy's potential level of output. The predominant method of estimating potential output at the IMF and the OECD is to use a simple production function, although in recent years the IMF has used a Hodrick-Prescott filter approach to estimate potential output for Australia. The production function method models output as a function of the underlying factors of production, linking output to the capital stock, the size of the labour force and trend total factor productivity. Potential output is then calculated as the level of output consistent with an economy's stock of capital and the 'natural rate' of unemployment (which is defined here as the unemployment rate consistent with stable inflation).

The second step in estimating structural fiscal indicators is to estimate the cyclical component of observed revenues and expenditures and to subtract this from observed revenues and expenditures. Both the IMF and OECD structural fiscal measures identify the cyclical component of budget aggregates by estimating the responsiveness of actual revenue and expenditure to deviations from the economy's potential level of output. In both measures, the cyclical component of revenues is estimated using elasticities for major tax revenue items drawn from the OECD's Economic Outlook Database. These elasticities are the product of marginal and average tax rates for four tax categories: personal, corporate, indirect and social security contributions. While both measures draw on the same primary source for these elasticities, the OECD individually adjusts revenue for each major tax item whereas the IMF uses an aggregate elasticity that reflects the weighted share of each tax category in total revenue. For Australia, the IMF also adjusts actual revenues according to a weighted average of the output gap in the current and previous years. This is done to reflect lags in tax collection.

Both the IMF and OECD measures of the structural budget balance are based on the assumption that unemployment benefits are the only cyclical component of expenditures. However, the manner in which unemployment benefits affect expenditure varies between the two measures. The IMF's structural measure implicitly assumes that changes in unemployment from the natural rate lead to a proportionate change in unemployment benefit expenditures. For Australia, the IMF calculates structural expenditure by deducting net advances as well as the difference between

actual unemployment benefit spending and the estimated level of benefit spending that would result if unemployment was at the natural rate.

While the OECD also assumes a proportionate change in unemployment benefit spending when actual unemployment deviates from the natural rate, the relationship between the unemployment rate and output is econometrically estimated for each country. Therefore, in the OECD's structural fiscal framework, a change in output can lead to a change in unemployment benefit expenditures that is greater than or less than one, depending on the country.

Table 1 in Appendix 1 provides a more detailed comparison of the two organisations' structural fiscal measures.

Structural fiscal indicators in practice

A number of assumptions are required to generate estimates of the structural fiscal position. As a consequence, these estimates have a relatively wide margin of error and need to be interpreted carefully.

The major weakness of structural fiscal indicators is their use of potential output estimates, with estimation of the cyclical component of revenues and expenditures sensitive to the size of the calculated output gap. Estimation of the output gap is dependent on identifying the level of potential output. Given that potential output cannot be observed directly, estimation requires assumptions about the rate at which the economy can grow without inflationary pressures emerging. In addition, this rate of growth will differ over time as the underlying structure of the economy changes. The confidence intervals around estimates of the output gap will often span both sizeable positive and negative output gaps.

This will be particularly the case when the economy is going through a period of structural change, such as that experienced in Australia over the past two decades. For example, reforms to the labour market are likely to have reduced the 'natural rate' of unemployment since the first half of the 1990s, and this has significant implications for the rate at which the economy is able to grow without facing inflationary pressures.

In addition to the confidence interval associated with output gap estimates, different techniques will generate different estimates of the size of the gap, with the range of commonly used techniques generating output gap estimates that often differ by a few percentage points of potential GDP.

In general, the sensitivity of the cyclical component to the size of the calculated output gap means that errors in the estimation of potential output can have significant effects on the estimated structural balance. A second limitation relates to assumptions made

about the cyclical sensitivity of revenue and expenditure. For example, unemployment benefits are not the only cyclically sensitive expenditure item. In addition, as outlined above, movements in commodity export prices, the terms of trade and overall nominal economic activity which affect the budget balance are not picked up in estimates of the output gap as these estimates are predicated on a real output framework. Further, the use of average and marginal tax rates to generate revenue elasticities can increase the risk of misleading results if the economy has been through a recent period of structural change, including changes to the tax system.

Looking at IMF and OECD estimates of Australia's output gap in each of the last six years, there has been some disagreement on the sign and magnitude of the gap in recent years (Table 1).

Table 1: Estimated output gaps for Australia[(a)]
Per cent of potential GDP

	2000	2001	2002	2003	2004	2005
OECD	1.4	-0.8	-0.5	-1.0	0.6	-1.0
IMF	-0.1	-0.6	-0.2	-1.0	-0.1	-0.3

(a) IMF and OECD data are estimates as at year of publication.
Source: IMF World Economic Outlook Database September 2000, October 2001, September 2002, October 2003, September 2004 and April 2005; OECD Economic Outlook 68, 70, 72, 74, 76 and Preliminary Edition 77.

Conceptually, a negative (positive) output gap[2] should result in a structural fiscal measure that is larger (smaller) than the estimated 'headline' balance. For example, a negative output gap would result in an estimated structural balance that represented either a larger surplus or a smaller deficit than suggested by the 'headline' measure. Looking at the estimated structural fiscal positions for the same year this pattern generally holds, with a negative output gap resulting in an estimated structural fiscal position that is larger than the estimated headline balance (Table 2).

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2   A positive output gap refers to actual output greater than potential and a negative output gap refers to actual output lower than potential.

Table 2: Comparison of estimated headline and structural Australian budget balances[a]

Consolidated general government financial balance as a per cent of GDP[b]

	2000	2001	2002	2003	2004	2005	Average 2000 to 2005
OECD							
Actual	0.9	0.1	0.1	0.8	0.7	0.9	0.6
Structural	0.6	0.1	0.3	1.1	0.5	1.2	0.6
IMF							
Actual	0.8	0.5	0.1	0.4	0.7	0.5	0.5
Structural	0.9	0.6	0.2	0.7	0.8	0.9	0.7

(a) All data are based on the consolidated general government sector. OECD and IMF Australian general government reflect budget data presented on a calendar year basis. All data points are estimates as at year of publication. Actual is as measured at the time of publication.
(b) Structural fiscal measures expressed as a per cent of potential GDP.
Source: IMF World Economic Outlook Database September 2000, October 2001, September 2002, October 2003, September 2004 and April 2005; OECD Economic Outlook 68, 70, 72, 74, 76 and Preliminary Edition 77.

In addition, despite the disagreement about the sign and magnitude of the output gap, both organisations' contemporaneous estimates of the structural fiscal position suggest that Australia was in structural surplus in each of the last six years. Over these six years, the average estimated structural surplus was 0.6 per cent of GDP for the OECD measure and 0.7 per cent of GDP for the IMF measure (Table 2).

As more historical information becomes available on the underlying structure of the economy, it should be possible to produce better informed backward-looking estimates of the output gap than those which can be produced contemporaneously. This suggests that ex-post estimates of the structural balance may be more reliable than those based on the current or forecast budget position.[3] In each of their semi-annual economic publications, the IMF and the OECD revise their output gap and structural fiscal estimates for prior years. Ex-post measures of the output gap are set out in Chart 1.

The IMF's revised output gap estimates suggest that since 1992, Australia has been close to potential except for a period below potential in the early 1990s and above potential in 1998, 1999 and 2000. The OECD's revised estimates for the same period imply output considerably below potential in the early 1990s and above potential output in most of the latter part of the period.

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3   However, it is worth noting that differences in the organisations' forecasts do not necessarily only reflect uncertainties in estimating the cyclical component of the budget. They could also reflect different assessments of the short-term outlook.

Chart 1: Revised IMF and OECD output gap estimates for Australia[a]

Per cent of potential GDP   Per cent of potential GDP

IMF
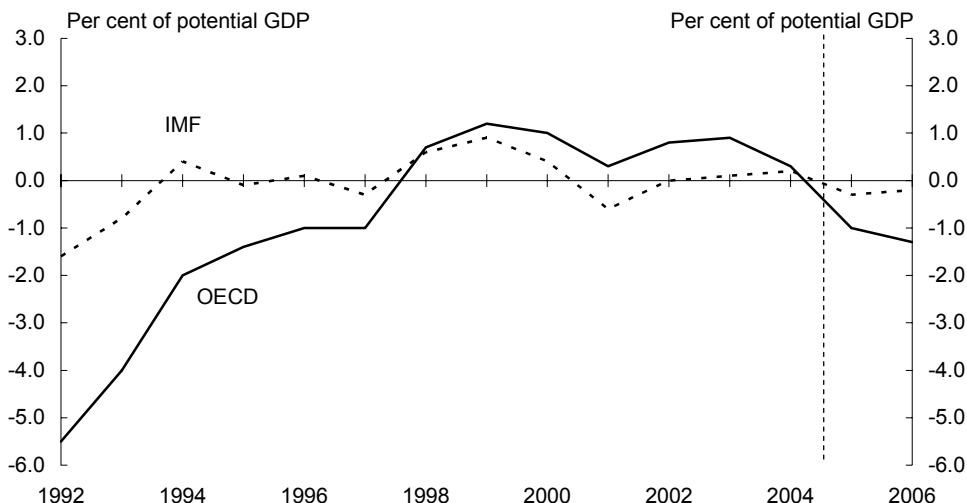
OECD

(a) OECD and IMF data are presented on a calendar year basis.
Source: OECD Economic Outlook, 76, Annex Table 10, December 2004 and Preliminary Edition 77,
May 2005; IMF World Economic Outlook Database, April 2005.

Looking at the most recent estimates for Australia, the OECD structural balance
measures suggest that the large deficits observed in the early 1990s were primarily
structural. Similarly, they suggest that the run of surpluses from the late 1990s also has
a substantial structural component (Chart 2).

Chart 2: Revised OECD fiscal estimates for Australia[a]

Per cent of potential GDP   Per cent of GDP

OECD financial balance (RHS)

OECD structural balance (LHS)
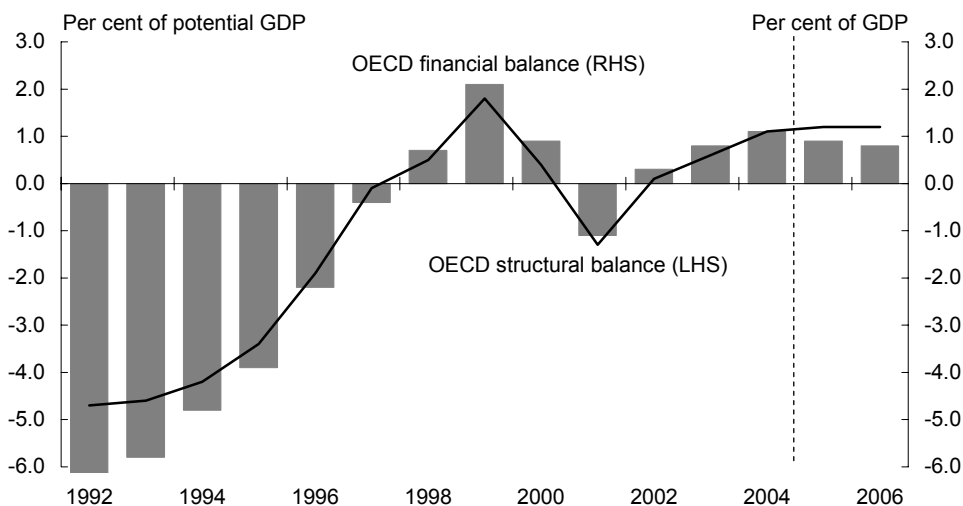
(a) All data are based on the consolidated general government sector as constructed by the OECD.
Source: OECD Economic Outlook, 76, Annex Table 27 and 28, December 2004 and Preliminary Edition 77,
May 2005.

In contrast, the IMF measure suggests that the budget was in large structural deficit in the early 1990s, before moving sharply to levels close to balance in the later part of the decade, and then into a modest structural surplus over the past few years (Chart 3).
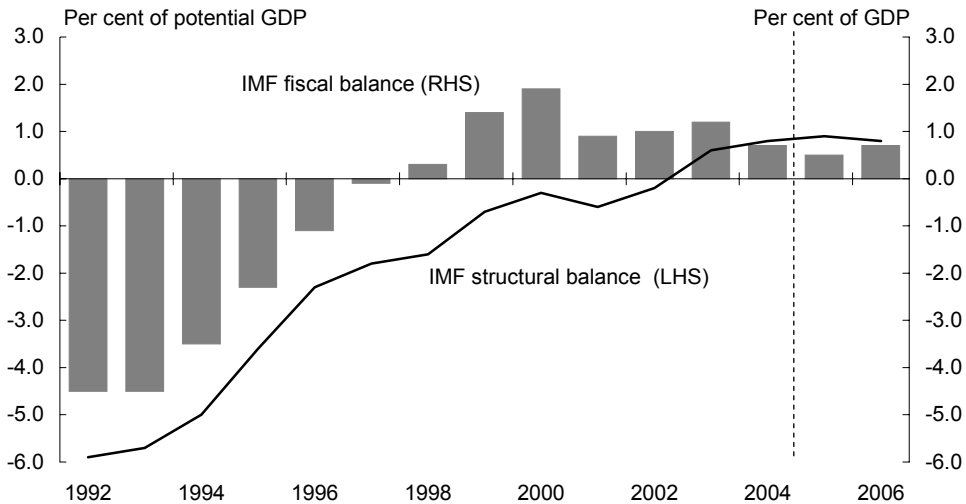
Chart 3: Revised IMF fiscal estimates for Australia[(a)]

(a) All data are based on the consolidated general government sector as constructed by the IMF.
Source: IMF World Economic Outlook Database, April 2005.

It is interesting to note that both estimates of the structural fiscal position are converging on the actual general government cash surplus as consensus emerges that the Australian economy is operating around potential (Chart 4). Moreover, both measures show a structural improvement in Australia's fiscal position over the past few years, despite differences in the estimated path to achieving that improvement.

Chart 4: Actual and structural balances for Australia[(a)]

Per cent of potential GDP   Per cent of GDP

General government cash balance (RHS)

OECD structural balance (LHS)

IMF structural balance (LHS)

1992   1994   1996   1998   2000   2002   2004   2006
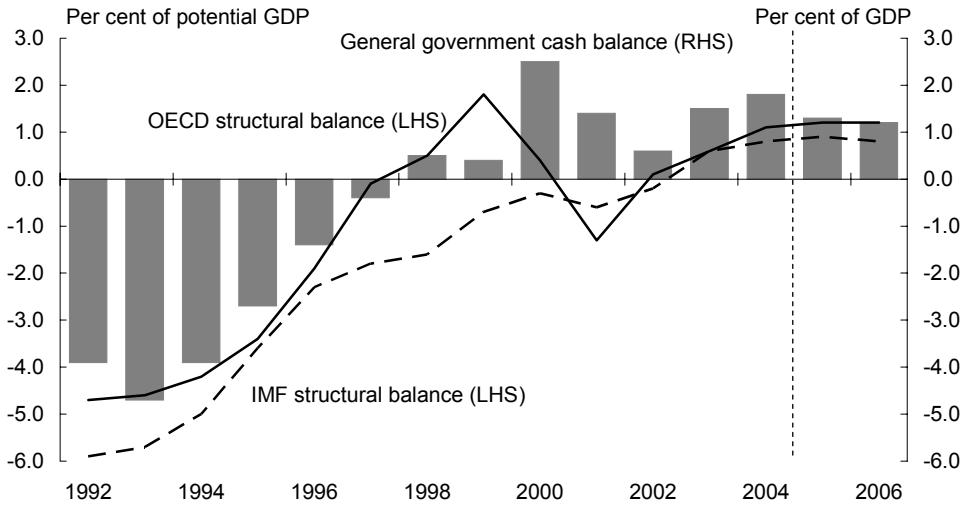
(a) All data are based on the consolidated general government sector. Australian data based on financial
     years but presented annually. For example, 1998 represents the 1997-98 financial year.
Source: OECD Economic Outlook, 76, Annex Table 28, December 2004 and Preliminary Edition 77,
May 2005; IMF World Economic Outlook Database, April 2005; 2005-06 Budget, Statement 12.

Conclusion

While fiscal policy is focused on the medium term, the economic cycle has short-term
effects on the government's fiscal position. The Australian Government does not
publish estimates of the structural fiscal balance because significant assumptions about
the economy's potential output level and the cyclical sensitivity of revenues are
required. Estimates are published by the OECD and IMF, and it is important to
understand how such measures should be interpreted. Movements in structural
balance estimates from year to year have been difficult to interpret in recent times, as
these estimates are highly sensitive to assumptions about the output gap. This is
particularly true given the structural changes in the economy over the past two
decades. However, the medium-term picture that emerges from OECD and IMF
estimates of the structural balance supports the view that there has been a significant
structural improvement in Australia's fiscal position over the past few years.

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Appendix 1

Table 1: Summary of main structural fiscal indicators

Feature	International Monetary Fund (IMF)	Organisation for Economic Cooperation and Development (OECD)
Output gap	Two-factor Cobb-Douglas production function predominates, particularly for industrialised countries. Hodrick-Prescott de-trending of certain variables.	Two factor Cobb-Douglas production function. CES function for Japan.
Expenditure	Primary (excluding capital spending), based on natural rate of unemployment. Natural rate of unemployment estimated using Okun coefficient to adjust actual rate of unemployment in proportion to the output gap. Implicitly assumes a proportionate relationship between unemployment benefit spending and deviations from the natural rate.	Primary (excludes capital spending), based on unemployment elasticity. Unemployment elasticity is the product of the reciprocal of Okun coefficient and the elasticity of unemployment benefit spending with respect to unemployment. This provides an estimate of the elasticity of unemployment benefit spending with respect to output. Elasticity of unemployment benefit spending with respect to output can be greater than or less than one.
Coverage	Consolidated general government (includes the States and Territories).	Consolidated general government (includes the States and Territories).
Revenue elasticities	Product of marginal and average tax rates. Tax categories are: corporate, personal, indirect and social security. Obtained from OECD Economic Outlook Database. Uses an aggregate elasticity which reflects weighed share of four tax categories in total revenue. Lagged aggregate elasticity included to reflect lags in corporate tax payments.	Product of marginal and average tax rates. Tax categories are: corporate, personal, indirect and social security. Obtained from OECD Economic Outlook Database. Revenue for major tax items adjusted individually for each of the four tax categories and summed.
Published	Semi-annually in IMF *World Economic Outlook*, April and September.	Semi-annually in *OECD Economic Outlook*, May and December.

The coherent principles approach to tax law design

Greg Pinder[1]

The Government is developing a new principles-based approach to the design of tax law, known as the *coherent principles approach*.

The approach is being phased in gradually, for amendments of existing provisions in the law that do not require extensive rewriting and for some new stand-alone measures.

This article explains how the coherent principles approach translates intended tax policy outcomes into principled rules in the tax law, and argues that the resulting law can be more certain, less complex and more flexible than the current black-letter tax law approach.

Introduction

Australia's tax laws are complex.[2] There are many good reasons why that is the case. In particular, tax laws deal with a complex commercial world and play many roles apart from raising revenue to pay for Government services: they are also used to advance other socially desirable goals such as providing financial benefits to particular sectors of society (for example, families with children and the aged) and incentives to engage in particular economic activities (for example, research and development).

However, another factor contributing to the current complexity of our tax laws has been the manner in which they have been developed and written.

Addressing this issue in its plan for a new tax system in 1998, the Government made a commitment to bring the tax laws together in a code that would use general principles in preference to long and detailed provisions.[3]

In pursuing that commitment, Treasury, together with the Office of Parliamentary Counsel (OPC) and the Australian Taxation Office (ATO), is developing a new approach to designing and drafting Australian tax laws that is called the *coherent principles approach*.

As foreshadowed in the Review of Aspects of Income Tax Self Assessment,[4] the coherent principles approach is being used to draft as many new tax measures as possible. The coherent principles approach will not, however, be suited to all new measures. It may not, for example, be appropriate for those measures that simply amend existing black-letter structures in the law, especially if using it would require extensive rewriting of the existing law.

The coherent principles approach has been used on three new measures to date: to allow consolidated groups to be headed by corporate unit trusts and public trading trusts (see Subdivision 713-C of the *Income Tax Assessment Act 1997*); to divide the income tax position of life insurance companies into one position for their superannuation business and one for their other business (see Subdivision 320-D of that Act); and to allow employees with shares under an employee share scheme to continue to defer being taxed on the discount they got when the shares were issued,

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2   For example, in *Hepples v Commissioner of Taxation* (1992) 173 CLR 492, Deane J said '[S]uccessive administrations have allowed the Act to become a legislative jungle in which even the non-specialist lawyer and accountant are likely to lose their way in the search to identify the provisions relevant to a particular case….' , p. 511.

3   *Tax reform: not a new tax, a new tax system*, Commonwealth of Australia; 1998; p. 149.

4   See pages 88 to 89 of the *Review of Aspects of Income Tax Self Assessment Discussion Paper* released in March 2004 and pages 65 to 67 of the *Report on Aspects of Income Tax Self Assessment* released in December 2004.

when their employer is taken over or restructures (see Subdivision DA of Division 13A of Part III of the *Income Tax Assessment Act 1936*).

This article outlines the coherent principles approach, using the employee share scheme amendments to illustrate elements of the approach. It ends with an assessment of the benefits of the approach over black-letter drafting styles.

The coherent principles approach

Principles-based approaches to drafting Australia's laws, including our tax laws, are not new. Even where laws are drafted using a black-letter drafting style, drafters, and those instructing the drafters, refer to the principles underlying those laws in deciding what the legislation needs to do.

But the tax laws have tended not to articulate those principles, instead emphasising the technical model that is developed to implement them. The technical model is the set of conceptual building blocks and rules that creates rights and imposes obligations. It is a necessary part of a law but need not exist independently of the principles it serves. A source of the complexity of our existing tax laws comes from making the technical model an end in itself. This over-reliance on the technical model characterises the black-letter approach that has been commonly used to draft tax laws for several decades.

The aim of the coherent principles approach, on the other hand, is to emphasise the principles (and, in particular, to specify them in the law) and to place less reliance on the technical model.

What is a coherent principle?

A principle is a statement about an intended outcome in a general field. Some commentators have focused on the degree of specificity as the quality that separates a principle from the rules that usually make up black-letter law.[5] But a principle is not just a less specific rule; it is a statement about the *essence* of all outcomes intended within its general field. When a principle works, it does so because the essence it captures appeals to readers at other than an abstract intellectual level; it *means* something to readers because it relates to their understanding of the real world.

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5   For example, Joseph Raz said 'Rules prescribe relatively specific acts; principles prescribe highly unspecific actions.' in *Legal Principles and the Limits of Law* (1972) 81 Yale LJ 823 p. 838.

The coherent principles approach aims to produce law expressed in such principles. A *principle* in this context:

• is an operative legislative rule;

• specifies the outcome, rather than the mechanism that achieves it; and

• expresses the outcome at the highest possible level rather than itemising a list of outcomes for every conceivable case.

The principles can only work together properly (ie can only be *coherent*) when they correctly identify the field in which they are intended to operate, and capture the essence of the intended outcomes in that field in a way that:

• helps the reader make sense and order out of the law; and

• is intuitive or obvious to someone who understands the law's context.

It also helps if the principles are drafted in a plain, non-technical style, avoiding the use of expressions that can only be understood by referring to definitions or other lower level rules.

Turning to the employee share scheme amendments, an example of a coherent principle can be found in subsection 139DQ(1) of the *Income Tax Assessment Act 1936*. It appears in Division 13A of Part III of that Act, which allows employees to defer tax on any discount they get when their employer issues shares to them under an employee share scheme. The deferral lasts for up to 10 years but is cut short if the employee (among other things) disposes of the shares or ceases employment with the company. Before the change in policy reflected in section 139DQ, the deferral was cut short by some company restructures. For example, if the employing company was taken over, and employees swapped their shares in it for shares in another company, they would have disposed of their original shares and so ended the deferral of tax on their discount. This outcome discouraged long-term participation in employee share schemes.

To resolve the issue, subsection 139DQ(1) says:

139DQ The effect of 100% takeovers and restructures on employee share schemes

Treating acquisitions as continuations of existing shares etc.

(1) To the extent that:

    (a) a taxpayer acquires:

        (i) shares in a company (the **new company**) that can reasonably be regarded as matching shares in another company (the **old company**) that the taxpayer had acquired under an employee share scheme; or

        (ii) rights in a company (the **new company**) that can reasonably be regarded as matching rights in another company (the **old company**) that the taxpayer had acquired under an employee share scheme; and

    (b) the acquisition occurs in connection with a 100% takeover, or a restructure, of the old company; and

    (c) as a result of the takeover or restructure, the taxpayer ceased to hold the shares or rights in the old company;

then, if the conditions in section 139DR are met, the matching shares or rights are treated, for the purposes of this Division, as if they were a continuation of the shares or rights in the old company.

Note: In determining to what extent something can reasonably be regarded as matching shares or rights in the old company, one of the factors to consider is the respective market values of that thing and of those shares or rights.

This subsection treats the replacement shares the employees get as a continuation of their original shares. This means that the actual disposal of the original shares is ignored, so the deferral will continue.

To achieve the same result, a black-letter alternative to subsection 139DQ(1) would have needed rules to:

• itemise which replacement shares and rights were not to trigger a taxing point;

• turn off each of the possible triggers for a taxing point;

• set the time the replacement shares or rights were taken to have been acquired; and

• set the purchase price for the replacement shares or rights.

Most black-letter approaches would have also duplicated these rules for the takeover and demerger cases.

Subsection 139DQ(1) is a principle because it tells you what the intended outcome is — that the original shares should continue despite the takeover — rather than detailing a mechanism to do that or specifying the outcome for each of a long list of takeover situations.

It works because it captures the essence of the intended outcome in a way that intuitively makes sense of the law (by treating the replacement shares as continuations of the original shares).

The principle is also the operative legislative rule. While principles do presently appear in the tax laws, most of them are not operative. Those that appear, for example in guide material in Acts that use the Tax Law Improvement Project[6] drafting style, are not usually operative and so cannot be relied upon to achieve an outcome directly.

The design process under this approach

The coherent principles approach is not simply a drafting style. It is a design approach for developing tax legislation.

This diagram shows the hierarchy of steps in that design approach:

Policy outcome	Policy
Policy means	
Legislative purpose	
Coherent principle/s	Law
Lower level detail (unfolding)	
Interpretation/systems	Admin

Policy outcome

The first step in the hierarchy is to articulate the intended policy outcome. This will be a principled statement, at an economic, political or social level, of the outcome the Government intends.

The intended policy outcome of the employee share scheme provisions in Division 13A of Part III of the *Income Tax Assessment Act 1936* is to encourage employee share

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6   The Tax Law Improvement Project was established in 1994 to rewrite the *Income Tax Assessment Act 1936*. Its main product was the *Income Tax Assessment Act 1997*, which employs a number of new drafting features. Several other Acts (for example, the *A New Tax System (Goods and Services Tax) Act 1999*) now use the same style.

ownership in order to allow both employees and employers to benefit through aligning their interests and their goals. Employees can benefit directly when their business does well, and employers benefit through a more committed and motivated workforce. The intended policy outcome of the recently enacted amendments (see subsection 139DQ(1) set out above), is to ensure that the Division achieves its intended policy outcome even after a corporate restructure.

Policy means

The next step in the hierarchy is to determine what means to use to achieve the policy outcome (or, in other words, *how* to give effect to the policy outcome). In tax laws, this will usually be a tax vehicle (for example, creating an income tax offset or a deduction, imposing an excise on new goods, or enacting a whole new tax) but is sometimes a non-tax vehicle, such as an appropriation.

The means chosen for the amendments to the employee share scheme provisions was to stop a taxing point being triggered when shares were disposed of as a temporary incident of a corporate restructure, by ignoring the disposal.

Legislative purpose (objects clause)

The next step is the first of the legislative steps in the hierarchy. It is to identify the intended legislative purpose, which will usually be expressed in the objects clause in the law. Not every legislative measure will have an objects clause, but new measures, and any significant new module added to an existing measure, will usually contain one.

The objects clause explains how the legislation will implement the desired policy outcome, using the chosen policy means. While the policy outcome and policy means are usually framed in economic, social or political terms, the objects clause needs to reflect legal principles and the legal framework underlying the tax laws. At its most effective, an objects clause will explain both the broader purpose or policy intent behind the measure (the *why*) and the way the provisions achieve that broader purpose (the *how*).

Coherent principle(s)

The next step is to develop the coherent principles that will be the operative rules for implementing the legislative purpose in the law. Treasury develops these principles by examining the possible situations in which the intended policy outcome is expected to apply and the results that are intended in those cases. Patterns that emerge from that examination are refined into a proposition about what the general result should be

across the range of likely situations, what the general characteristics of those situations are, and how that result and those characteristics can be expressed as principles. That proposition, and the principles it advances, are tested and refined by applying them to a range of different scenarios. Following this initial testing, the proposition is developed as a series of instructions to the OPC to prepare legislation.

At various stages of its development, the proposition and resulting principles will be further refined by consultations with the ATO, the tax profession and other interested parties.

The principles will be structured to flow logically in the order in which they interact. For small measures, there might be only one principle. For other measures, there will be a hierarchy of principles, and at times a collection of principles with no discernable hierarchy, that work together to achieve the legislative purpose.

When principles are grafted onto an area of the law that is expressed in black-letter terms, the 'meshing' of the new drafting approach and the existing law will be critical. In some such cases, practicalities may dictate that amending the existing framework in a black-letter style would be more appropriate than adding the amendments in a principled form. But, if the amendments are added as principles, particular attention has to be paid to providing a bridge between the principled rules of the new measure and the black-letter rules of the existing law with which it interacts.

For the employee share scheme amendments, the main principles are in Subdivision DA of Division 13A of Part III of the *Income Tax Assessment Act 1936*, and in subsection 139DQ(1) in particular (see above). Division 13A is otherwise written in a black-letter form.

The new Subdivision, written using the coherent principles approach, has been inserted into the middle of Division 13A, thus demonstrating that principled law can be used to amend existing black-letter provisions. The bridge between the new principles and the existing black-letter law that makes that possible in this case is that the principles directly affect an element of the existing black-letter structure: the trigger events that bring the tax deferral to an end.

An alternative, in some cases, will be to rewrite an existing area of black-letter law in a principled form incorporating the amendments. However, rewriting an area would only be appropriate when a thorough examination suggested that it was the most effective approach. For instance, if wholesale amendments were proposed to an area, it may be more practical to rewrite it in a principled form.

Carve-outs and add-ons

Sometimes the principle that seems the most natural or intuitive will encompass more situations than the policy outcome is intended to cover. That can be addressed by amending the principle to bring its scope within the intended bounds. But, often a better approach will be to retain the broader principle and identify carve-outs from its operation.

The reason for preferring the alternative approach is that the broader principle expresses the intended idea in a way that will make more sense to readers than modifying the principle. This happens when a modified principle would compromise the reader's intuitive grasp of what the law is doing and so actually reduce reader comprehension.

At other times the natural or intuitive principle will not cover a situation the amendments are intended to cover. The preferred course will usually be to identify the add-on to, or extension of, the principle, rather than to change the principle itself. The reasons are the same as those, outlined above, for using a carve-out.

An instance of an add-on can be found in subsection 139CA(4) of the *Income Tax Assessment Act 1936*, added as part of the employee share scheme amendments. Paragraph 139CA(2)(b) says that the deferral of tax on the discount an employee received on a share issued under an employee share scheme comes to an end when any restriction on disposing of the share stops applying. This can be a problem in a takeover case because a takeover offer usually does not offer employees replacement shares that maintain existing restrictions on disposal if the offer to other shareholders is replacement shares without restrictions. So, even if the continuation principle applied, tax on the deferral could be triggered because restrictions on disposal of the original shares would not apply to the replacement shares. To address that issue, subsection 139CA(4) says:

> (4)   Paragraph (2)(b) does not apply in relation to a share that, because of section 139DQ, is treated, for the purposes of this Division, as if it were a continuation of a share acquired under an employee share scheme.

That subsection removes the taxing point that would otherwise arise when employee shares with restrictions on disposal are replaced with shares without restrictions during a takeover or other corporate restructure. It is not a modification of the 'continuation' principle, but an add-on to the law. Had the principle instead been modified, its intuitiveness might have been compromised and its effectiveness more limited.

Lower level detail ('unfolding')

A well-written principle will describe the intended outcome clearly enough to produce workable results. However, there can still be cases where it is useful to explain the principle's application to particular situations or where there may be a sufficient doubt or ambiguity about its meaning or scope to warrant clarification. The process of explanation and clarification is called 'unfolding' the principle.

To identify appropriate cases for unfolding, the principles are tested against known situations to ensure that the intended outcome is clear in those cases. Where it is not, unfolding will be necessary.

Unfolding may occur in the primary law itself by including a note, an example or further provisions in the Act. Sometimes unfolding will be done in subordinate legislation (such as regulations). More commonly, unfolding will occur in the explanatory memorandum that accompanies a Bill into Parliament.

An example of unfolding in the law can be seen in the note at the end of subsection 139DQ(1), quoted above. It does not change the law; it merely makes it clear that equivalence of the market values of the original and replacement shares was one of the factors the Parliament intended would be taken into account in deciding whether the replacement shares 'match' the original shares.

As a general rule, too much reliance on unfolding in the primary law or in subordinate legislation, particularly in obvious situations, could diminish the benefits of using the coherent principles approach: it could add to the length and complexity of the law, and could even cast doubt on the intended interpretation of the principles it is explaining.

Administration — Interpretation/systems

After law that uses the coherent principles approach is enacted, experience may suggest that further guidance is necessary in specific situations. In such cases, as now, the Commissioner of Taxation will publish rulings and other interpretive material to explain how the law applies to those situations. That process is also part of unfolding the principles.

But it does not mean the ATO is inventing the law. In those cases, the Commissioner is explaining how he thinks the principles apply, not creating the principles themselves. The principles are enacted by Parliament and, like any legislation, impose limits on what interpretations can be drawn from them. In the final analysis, the judiciary will adjudicate on whether the Commissioner's interpretations are correct, in the same way as it already rules on the correctness of his interpretations of black-letter legislation.

Key issues

Coherent principles and certainty

One of the concerns about using a principle-based legislative approach is whether it will produce law that is less certain than black-letter law is thought to be.

However, black-letter law is itself far from certain. Language is inherently ambiguous and the more complex the ideas it expresses, the greater the chance an ambiguity will arise. The problem is exacerbated with law as lengthy as the income tax law, because its sheer length makes it difficult to know what things it covers, and how it covers them.

Even recognising these inherent problems, most people's natural assumption is that, if the law deals specifically with every issue, it must be more certain than a law that covers the issues in a principle-based way.

However, our tax law does not, and probably cannot, deal specifically with every issue. Even if it could, it would have to be so long that it would take an unacceptable amount of time to reach a definitive answer to all but the simplest questions.

Since our tax laws do not deal specifically with every issue, the actual question becomes 'how can there be certainty about cases that the law does not deal with expressly?'

In those cases, a black-letter approach is actually highly uncertain because there is no way to know how, in principle, to derive an answer. The black-letter approach typically has to address such uncertainty by requiring the law to be amended to cover each new case as it emerges.

An illustration of that process was the growth in the number of capital allowance regimes in the income tax law since 1936. Under the income tax law, capital expenses are not normally deductible against income, so a special rule is needed when such deductions are to be allowed. An initial regime in the *Income Tax Assessment Act 1936* allowing deductions for 'plant' depreciation was augmented over the next 60 years by similar regimes for depreciating buildings, for writing off investments in research and development, for writing down film copyrights, for depreciating telephone connections to rural land, for depreciating land care improvements, and so on for over

30 separate regimes.[7] This amendment process, which is usually necessary for black-letter law, may deal with the problem for that instance but does not do so for any future instances, so their treatment remains uncertain.

The approach of principle-based law is very different. It aims to deal with issues at a general, or thematic, level and only descends to detail when there is something specific about a particular case that requires separate attention. There is less room to argue that each new situation can only be dealt with properly by a new specific rule because the principle is intended to deal with *all* relevant situations. Even as new situations emerge, a properly constructed principle provides a framework for working out how to deal with them.

In the capital allowance cases, such a principle might have asked whether a non-private expense produced benefits beyond the year in which it was incurred and, if so, apportioned a deduction for it between the years in which it produced those benefits.[8] In that case there would be no need for a new regime each time another situation emerged.

Coherent principles and stability

If tax law does not cover everything it needs to cover, covers something in an inappropriate or ambiguous way, or has been interpreted in an unintended way, it usually needs to be amended.

The continuing need for amendment ties up the resources of the Parliament, which must consider and vote on any proposed law; of the ATO, which must administer it; of tax practitioners, who must keep abreast of the changes; and of taxpayers, who must adjust their affairs accordingly.

Principle-based provisions, on the other hand, will describe what the law does rather than how it does it. That can give the ATO the flexibility to design administrative systems that minimise the compliance burdens on taxpayers and tax practitioners.

It can also leave the law flexible enough to apply to newly emerging arrangements, commercial and otherwise, that the legislature could not have specifically contemplated when it enacted the law, but are nevertheless within the scope of its policy.

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7   The number of capital allowance regimes was greatly reduced with the enactment of the *New Business Tax System (Capital Allowances) Act 2001*, which replaced most of the separate capital allowances with a generic treatment (see Division 40 of the *Income Tax Assessment Act 1997*).

8   I am indebted to Professor Rick Krever for this suggestion.

Currently, newly emerging arrangements can create problems with the administration, interpretation or scope of the law, that have to be fixed legislatively because the law does not cover them at all or covers them in an unexpected way. Legislative amendments can take a long time. In the interim, the problem continues. Using principles to design and draft tax law can provide the flexibility for practitioners and the ATO to improve administration of the law, and to clarify its interpretation, without that delay. In particular, practitioners and taxpayers can interpret and apply the principles to their own situations without having to wait for either a legislative amendment or an ATO ruling to appear.

Draft law that makes it easier to understand the key concepts may also provide a better basis for consultation. Law prepared using the coherent principles approach could make it easier to understand how proposed amendments fit with existing law. This could reduce the preparation time practitioners need to make useful contributions during consultation, and so increase both the number of practitioners able to contribute in a consultation process, and the effectiveness of their contributions. That, in turn, may lead to better law.

If law is conceptually clearer, is interpreted more frequently in accordance with Parliament's intention, adapts to changes in the commercial environment and undergoes more effective consultation, there will be less need to amend it to preserve its original intention or keep it up-to-date. Law that changes less often is more stable law, and that is of considerable advantage to taxpayers and practitioners.

How does the coherent principles approach help with complexity?

The primary goal of the current black-letter approach to tax law is to realise an effective technical model, so that the law works. The effective communication of that technical model to readers, while important, has been a secondary consideration. But, even if communication had been the primary focus, complexity would still have been a problem because it is an inherent result of trying to write a rule for each situation.

The coherent principles approach, in contrast, may provide at least a partial solution to the issue of complexity. It aims to explain the law's intended outcomes, not to detail the law's application in a variety of different situations. Although that does not reduce the number of issues the law has to cover, it does synthesise into a few principles what in a black-letter version could be several ideas and many rules. This can greatly reduce the number of ideas in the law and the interactions between those ideas.

Perhaps more significantly, presenting the ideas as principles can help readers to organise their thinking about what the law is doing. Having fewer ideas makes a better structure possible, especially if those ideas map onto the reader's existing understanding of the world.

Those two things — fewer ideas to wrestle with and a more naturally grasped organisation of the ideas that are used — can mean that for most readers, law designed and written under the coherent principles approach may be both less complex and more comprehensible than black-letter law.

Over time, black-letter law could be expected to require more amendments than would a version using principles. This is mainly because black-letter law aims to cover each relevant situation specifically and new situations do emerge from time to time. Those extra amendments in the black-letter version mean that it will usually come to have more ideas and a less well-organised structure than its coherent principles equivalent. Therefore, over time, readers will always find a black-letter version more complex to deal with.

It is true that some details traditionally provided in the primary law may migrate to subordinate law (for example, regulations) or to explanatory material (for example, the explanatory memorandum or ATO rulings). But that qualification should not lead to the conclusion that law using the coherent principles approach will be just as detailed and as complex as black-letter law, only with the detail transposed to different places. Moving details into other material is a possibility to be aware of and guard against, not a likelihood.

Explanatory memoranda and rulings already contain a lot of detail and should not grow simply because the primary law is no longer as detailed. In any case, an advantage of moving the details on a particular topic to secondary materials such as an ATO ruling is that they only need to be read in cases where that topic was in issue. If the detail is in the law, you have to read all of it to be sure you have read everything relevant to your current case.

Ultimately, however, the aim of the coherent principles approach is to avoid the need for detail in the first place, not to move it somewhere else. Achieving that outcome may involve a change in culture on the part of both the ATO and practitioners. If the ATO were to be deluged by demands for rulings on obvious applications of clear principles, the potential benefits of the approach would be unlikely to be realised.

The coherent principles approach and the judiciary

The judiciary's approach to interpretation of principle-based law will, of course, be important to its success.

The inherent ambiguity of language can make interpretation of law difficult whatever style of drafting is chosen. But this problem can be worse with black-letter law, where the absence of a stated principle makes it harder to discern the purpose of the law and so increases the chance that the interpretive task becomes an abstract exercise rather

than a real attempt to understand Parliament's intention. This is exacerbated if black-letter law is silent about a situation, such as a commercial development not contemplated when the law was drafted. In those cases, the courts can be left with no means of knowing what Parliament wanted to happen.

The judiciary has, on occasion, expressed a desire for the law to contain statements of its underlying purpose so that the courts can more frequently interpret it in accordance with Parliament's intention. For instance, in November 1996, the then President of the New Zealand Court of Appeal, Sir Ivor Richardson, said:[9]

> Now the standard judicial approach to the interpretation of all legislation is to consider its purpose, its scheme and its language. The judges have to gain an overall understanding of the legislation they are interpreting. If the legislation is just a morass of detail, the judges will try to work out the scheme and interpret for themselves and they will try to take a big picture approach. So clear statements of policy intention and of underlying principles and criteria in settling the rules for determining tax liability will assist the courts and all uses (sic) of legislation.

The coherent principles approach may make it possible to deliver on that sort of judicial preference.

Next steps

Using coherent principles in tax laws is being phased in gradually. The effectiveness of the approach can only really be tested and judged on actual legislative measures. If the benefits of the approach are to be fully realised, the results of those measures have to be properly evaluated and the lessons from them identified and applied to further measures.

Measures that are already in the pipeline should not be delayed unnecessarily by imposing a principle-based approach on them, particularly where those measures simply amend existing black-letter structures in the law. Attempting to redraft entire structures on a principled basis would add unacceptable delays to achieving existing legislative commitments.

The measures being chosen to test the new approach should be those where it offers the greatest benefits. These are typically measures that are self-contained rather than

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9   The conference proceedings of the tax drafting conference; hosted by the Inland Revenue Department of New Zealand; Auckland; 27-29 November 1996; pp. 29-30.

those that modify existing black-letter law,[10] and those that can be developed on a principled basis from their earliest stages.

Each measure that uses the approach is evaluated by Government and, of course, by the wider tax profession. Consultation on the measures that have used the approach, even though its use has been limited so far, has been most encouraging.[11]

Conclusion

The coherent principles approach is not a panacea for all the ills, real or imagined, of Australia's tax laws. But it does hold promise as *one* means for addressing concerns about the sustainability of our tax laws.

In particular, principle-based law can be conceptually clearer. It avoids the necessity for the details so prevalent in black-letter law, by synthesising them into principles that produce the outcomes Parliament intends. Principles also tend to fit together into better structures. Clear, operative statements of Parliament's intention and better, more intuitive structures should usually combine to produce law that is less complex than black-letter law.

The approach also offers the advantages of flexibility and robustness. Law that uses the approach is likely to adapt better to an evolving world without the need for constant amendments to keep it up to date or to ensure that it applies to every intended situation. If it needs fewer amendments, it will tend to be stable.

Finally, the approach can highlight complexities in implementing policy choices, which can otherwise be hidden in a legislative design that focuses on a technical model. With the additional complexity from particular options for implementing a policy being more obvious, this can better inform policy developers about how their decisions affect equity, efficiency and simplicity and could, itself, lead to less complex policy implementation options. That can only be positive for the wellbeing of Australians.

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10 That said, it can still be used in some of those cases. The employee share scheme amendments are an instance of such a case.

11 As noted at the beginning of this article, the coherent principles approach has been used to allow consolidated groups to be headed by corporate unit trusts and public trading trusts; to divide the income tax position of life insurance companies into one position for their superannuation business and one for their other business; and to allow employees with shares under an employee share scheme to continue to defer being taxed on the discount they got when the shares were issued, when their employer is taken over or restructures.

Key themes from the Treasury Business Liaison Program — February and April 2005

Treasury met with around 100 companies and organisations in Sydney, Melbourne, Brisbane, Canberra and Emerald in its Business Liaison Program in February and April 2005.[1]

Businesses reported that Australia's economic conditions remain buoyant, although sales have slowed since the latter part of 2004. This accords with the findings of most surveys of business sentiment. Businesses reported strong profits, with firms continuing to increase their productivity.

Queensland and Western Australia remain the states with the strongest demand, reflecting population growth and strength in the resources sector.

Firms and farmers reported increased skills shortages in a number of areas and increased difficulties in retaining and recruiting unskilled labour in remote areas. This is putting upward pressure on labour costs for some occupations, but the more flexible labour market means this has not spread across the economy.

Businesses noted that inflationary pressures remain well-contained. Strong global competition and innovation continue to drive down the prices of many internationally traded goods.

Treasury greatly appreciates the commitment of time and effort made by the Australian businesses and industry associations that participate in the Business Liaison Program.[2]

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1 A detailed explanation of the Treasury Business Liaison Program is provided in the Australian Government Treasury Economic Roundup, Spring 2001.
2 This summary of business conditions reported in liaison meetings reflects the views and opinions of participants. It is provided for the information of readers. Treasury's evaluation of the economic outlook is informed by findings from business liaison and a wide range of information and data to ensure a rigorous assessment of the Australian economy.

Retail trade

Retailers reported that sales had slowed from late 2004. A number of factors were mentioned as contributing to the slowdown. One temporary factor noted was the generous response of Australians to the tsunami appeals, which reduced the money available for discretionary spending. Some contacts also suggested that the tsunami may have led to a disinclination towards spending on luxury goods. The increase in interest rates in early March — the first rise in over a year — and some weaker than anticipated economic news around the same time were also cited as factors depressing consumer sentiment.

Some retailers thought consumers were moderating spending to rein in debt. This was thought likely in an environment where house prices are no longer adding significantly to wealth. Higher petrol prices have also reduced money available for other spending. And the high visibility of petrol prices may increase their impact on spending decisions. The slower pace of home sales and construction is reducing demand for durable goods. Finally, weather conditions have been mild in most of Australia, reducing demand for seasonal clothing, and for products such as air conditioners.

Some retailers suggested customers were becoming more price-sensitive. They were delaying expenditure until stores offered 'sales', and were requiring larger discounts to increase their purchases. A number of retailers said they were only maintaining sales volumes by cutting prices. The strongest sales growth was seen in consumer electronics such as digital cameras, DVD players and plasma and LCD television screens, where prices are dropping and new features are being introduced.

Production and investment

Manufacturing

Only a few manufacturers, mostly supplying the construction industry, reported running out of capacity or an urgent need to invest more in equipment. Any capacity problems appeared to relate more to distribution than production.

Construction

Construction activity was tending to moderate in most areas. However, the downturn in housing construction was expected to continue to be very mild by historical standards. There were some pockets where activity had dropped off more substantially, such as inner city developments targeted at investors.

Agriculture

In many parts of Australia the rural sector has not fully recovered from the 2002-03 drought, with low levels of water in rivers and dams, low sub-soil moisture and reduced flocks and herds. Despite these difficulties, many contacts reported that the price of rural land has risen significantly, which has made it easier for farmers to borrow. Contacts noted a long-run tendency towards consolidation of properties which allows economies of scale and diversification benefits.

Australia's beef exports to Japan are particularly strong at present with the United States temporarily out of the market. This has led to increased slaughtering in Australia and has therefore slowed the rebuilding of herds. In the medium term, South American beef producers were viewed as increasingly strong competitors. Contacts noted that grain prices were historically low, reflecting high world inventories.

Rural employment fell markedly during the drought and has not fully recovered. Partly this is due to the lingering effects of the drought on herd and flock sizes. But it also reflects difficulties in farmers attracting workers. Former farm workers have moved to the cities, or to work for mining companies, and casual workers have become harder to find. Contacts noted that some fruit had not been harvested due to a lack of available labour.

Tourism and education

Businesses in the tourism industry indicated that more Australians were taking overseas holidays in place of domestic travel. They attributed this to the appreciation of the dollar, and an easing in international tensions and terrorism concerns. Higher petrol prices may also be discouraging domestic holiday travel. The high Australian dollar was also adversely affecting foreign tourism into Australia.

Employment

The majority of the companies interviewed expected to maintain employment around current levels. In a few cases it was noted that automation to improve efficiency would reduce employment. However, in strongly growing sectors such as mining, employment was expected to increase. Retailers expanding their outlets were also expecting to hire additional staff. The finance industry, which had seen very strong growth since the 1980s, was not expecting to increase employment, other than in compliance areas.

There were increasing numbers of firms reporting difficulty in retaining or hiring staff with particular skills. Among occupations mentioned as having particular shortages were accountants, engineers, some IT areas, tilers, electricians, professionals in the

construction industry and truck drivers. There was also increasing competition for good sales and marketing people, exacerbated by less interest being shown by young people in retailing as a career.

Some firms seeking staff had not received suitable responses from advertising in the usual channels. Some of these firms had switched to other forms of recruitment such as bonuses for staff referring new starters or hiring overseas.

The increased investment in the mining sector has increased the demand for labour and the markedly higher prices recently negotiated for iron ore and coal exports have increased the capacity of mining companies to pay higher wages. Accordingly, the mining sector is attracting workers such as truck drivers and cooks away from other sectors. Particularly hard hit have been farmers in areas close to mines.

Labour costs

Unsurprisingly, firms noted upward pressure on labour costs for occupations where labour is in short supply. For some specialised occupations, salaries were rising sharply while in other sectors wage growth was muted. Some managers reported that younger workers were placing less emphasis on salaries but were demanding improved conditions, such as childcare, more flexible working times, job-sharing or more ready access to leave without pay and secondments.

Costs, prices and profits

The rise in global oil prices is gradually permeating through the economy. For example, contacts reported higher prices for plastics and foam rubber and higher freight charges. Steel, aluminium and tin prices were also considerably higher. Farmers were paying more for fertiliser.

A number of retailers reported large rises in rents, particularly for prime sites in shopping malls. While expenditure on accounting services had increased, insurance premia had fallen. Some firms had responded to the slowing in sales by cutting back on advertising expenditure while a minority had responded by increasing it.

Some firms were able to pass on cost increases, but many contacts said competitive market conditions would not allow this. In most cases productivity increases, cheaper costs for imports, and sometimes higher volumes, were allowing profits to be maintained with only modest price rises.

Accounting standards

Australian equivalents to International Financial Reporting Standards (IFRS) replaced existing Australian Accounting Standards for financial reporting periods beginning on or after 1 January 2005. Many multinational companies in Australia already operate under international standards so have been little affected. Other large companies have had some work to do but found it manageable. Medium-sized companies raised some concerns about IFRS. In some cases firms reported a need to increase accounting resources. Companies which raise funds in the United States reported that meeting the new requirements of the Sarbanes-Oxley Act was far more onerous than the IFRS.

Environmental regulations

Most contacts accepted the need to better manage the use of scarce resources such as water and to cut down on packaging. However, some firms and farmers expressed concern that environmental regulations were unduly hampering their operations or involved high compliance costs. There was a perception that these restrictions had become more stringent, and the differences in rules between states added further to complexity and costs.

Sources of economic data

The following table provides sources for key economic data. Australian Bureau of Statistics (ABS) data can be obtained over the internet at **http://www.abs.gov.au**. The Reserve Bank of Australia information is available at **http://www.rba.gov.au**. Similarly, OECD information is available at **http://www.oecd.org**. Information on individual economies is also available via the IMF at **http://www.imf.org**.

International economy	
Output, current account balance and interest rates	OECD Main Economic Indicators
Consumer price inflation	ABS cat. no. 6401.0
National accounts	
Components of GDP, contributions to change in GDP	ABS cat. no. 5206.0
Incomes, costs and prices	
Real household income	ABS cat. nos. 5204.0 and 5206.0
Wages, labour costs and company income	ABS cat. nos. 5204.0, 5206.0 and 6302.0
Prices	ABS cat. nos. 6401.0 and 5206.0
Labour market	ABS cat. no. 6202.0
External sector	
Australia's current account, external liabilities and income flows	ABS cat. nos. 5368.0, 5302.0 and 5206.0

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Australian net private wealth

Key themes from the Treasury Business Liaison Program — November 2004

Spring 2004

Foreign reserve accumulation in Asia: Can it be sustained?

International trends in company tax rates — implications for Australia's company income tax

Improving global frameworks for corporate regulation: an Australian perspective

2003-04 in review: continued expansion and world economic recovery

Key themes from the Treasury Business Liaison Program — July-August 2004

Copies of these articles are available from the Treasury. Written requests should be sent to Manager, Domestic Economy Division, The Treasury, Langton Crescent, Parkes, ACT, 2600. Telephone requests should be directed to Mr Chris McLennan on (02) 6263 2756. Copies may be downloaded from the Treasury web site http://www.treasury.gov.au.

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