Productivity Growth in Australia: Are We Enjoying a Miracle?*

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1. Introduction and summary

Australia's growth performance in the 1990s was outstanding. For nine years, growth averaged just under 4 per cent annually — a performance not seen since the 1960s and early 1970s. The ability to grow so strongly, even in the midst of economic challenges such as the Asian financial crisis, led some to label Australia as the 'miracle' economy (for example, Krugman 1998).

A surge in productivity growth underpinned the good performance. The 1990s saw:

- the longest period of continuous increase in productivity on record (9 years);
- the highest rate of underlying growth in productivity (multifactor productivity growth at 1.8 per cent a year compared with 0.7 per cent a year from the early 1980s); and
- Australia's productivity growth outpoint the OECD average for the first time (Australia had the second highest productivity acceleration in the 1990s).

This was no miracle. The productivity surge was certainly remarkable. But it was more the 'predictable' outcome of policy reforms designed to raise Australia's productivity performance than it was simply the result of good fortune.

The reform strategy did not attempt to steer the Australian economy in a particular, nominated direction in order to raise productivity growth. Rather, it was designed to sharpen incentives to be more productive (largely through increased competition)

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and allow businesses greater flexibility to adapt in order to meet stronger competition and to adjust to changing market circumstances.

The strength of this strategy has been seen not only in the better productivity outcomes, but in the resilience of the economy to adverse shocks — the Asian financial crisis — and the ability to take on new developments — the rapid advances in information and communications technologies (ICTs) in the second half of the 1990s — with a vigour and application not usually seen in Australia.

The central point in this paper is that productivity growth provides the very foundation for Australia to move towards opportunity and prosperity. This is readily seen in the links between growth in productivity and growth in average incomes. Growth in productivity is not everything — nor is growth in average income. But it is much more difficult for a country to move forward without them.

The 'new' element in this paper is to cast Australia's productivity and income growth experience in an international setting.

Australia's growth in average income (or GDP per capita) was below the OECD average over the post-war period from 1950 to 1990. Our ranking on level of GDP per capita among OECD countries (measured on an internationally comparable basis) slipped from 5 to 15. This was principally due to our poorer rate of productivity growth.

But, according to the international data, our annual average rate of growth in GDP per capita increased to 2.5 per cent in the 1990s (up from a previous rate of 1.7 per cent). Annual productivity growth at 2.3 per cent accounted for around 90 per cent of the 1990s average income growth and 96 per cent of the 0.8 of a percentage point acceleration from the previous average.

Australia was ahead of OECD income and productivity growth in the 1990s — the OECD average being 1.7 per cent for GDP per capita and 1.8 per cent for productivity. Australia was also ahead of a much-noted improver — the USA — in both income (2.0 per cent) and productivity (1.6 per cent) growth.

As a result of the strong productivity growth in the 1990s, Australia raised its ranking on GDP per capita to 7 in 2001 (up from 15 in 1990).

However, despite the strong 1990s productivity growth, Australia still has a sizeable productivity gap with other countries. On GDP per hour worked, Australia ranked 14 in 2001 and had a labour productivity level at 83 per cent of the US level. We picked up 6 percentage points on the US level over the 1990s, but only one position on international ranking.

Australia's high ranking on average income *levels* actually owes a lot to a high level of labour utilisation — that is, the combination of high average hours worked and a high rate of employment in the total population. In a sense, we are rewarded for putting in relatively large amounts of time at work, while the return on each hour worked remains relatively low.

Continuing to catch up to other countries on productivity (and not so much on labour utilisation where Australia is already toward the front of the international pack) therefore seems to be a priority for Australia if we want further improvements in opportunity and prosperity.

There appears to be scope for Australia to continue generating strong productivity growth. Other countries have shown in the past a much greater capacity to catch up toward (or even overtake) US productivity levels than Australia has yet shown. Australia only started to catch up in the 1990s.

Australia is also well placed — better placed than many other countries — to keep pace with the new US productivity acceleration associated with ICTs. Australia has already caught a second productivity wave related to the smart use of ICTs.

But we cannot ask for miracles to maintain strong productivity growth. The productivity gains of the 1990s came through commitment to policy reforms. Further commitment will help to ensure the economy has the strong foundation that strong productivity growth provides.

The paper is structured as follows. The main features of Australia's much improved productivity performance are outlined in the next section. Section 3 briefly reviews the main contributors to Australia's productivity surge. Section 4 contains the international analysis of productivity and prosperity among OECD countries. The final section examines the productivity outlook and draws some policy implications.

2. Key features of Australia's productivity performance

Australia's productivity surge in the 1990s has been highlighted in a number of previous papers (see, for example, IC 1997, Edwards 1999, Treasury 1999, Parham 1999, PC 1999, Dowrick 2000, Johnston et al 2000, Parham et al 2000, Gruen 2001). A few key features are summarised here.

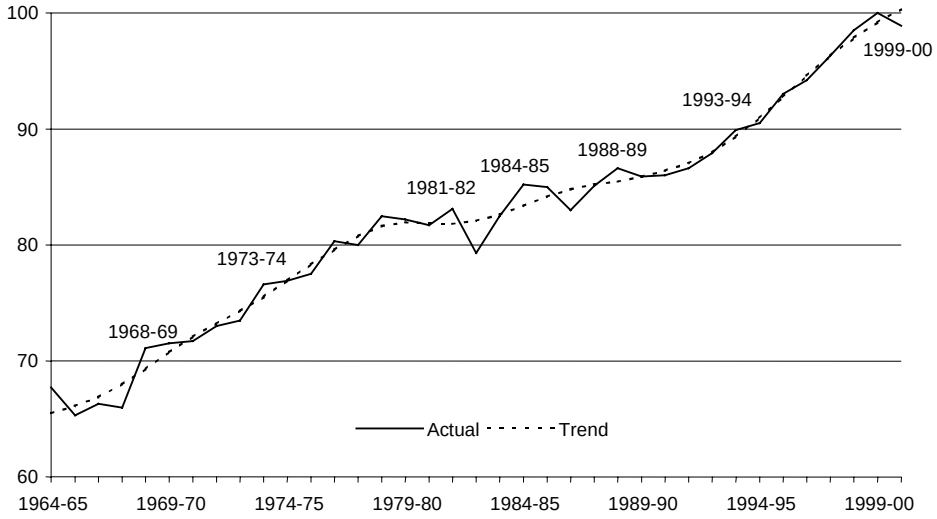
Two productivity measures are mostly presented:

- labour productivity — the amount of output produced per unit of labour used; and

- multifactor productivity (MFP) — the ratio of output produced to combined input of labour and capital (buildings, machinery, equipment, etc).

Improvements in productivity can have connotations of both increased efficiency — the production of goods and services with less waste — and increased effectiveness — the use of resources in ways that generate more value added.

Figure 1 **Australia's multifactor productivity, 1964-65 to 2000-01**
Index (1999 = 100)



Source: ABS 5204.0 and unpublished estimates.

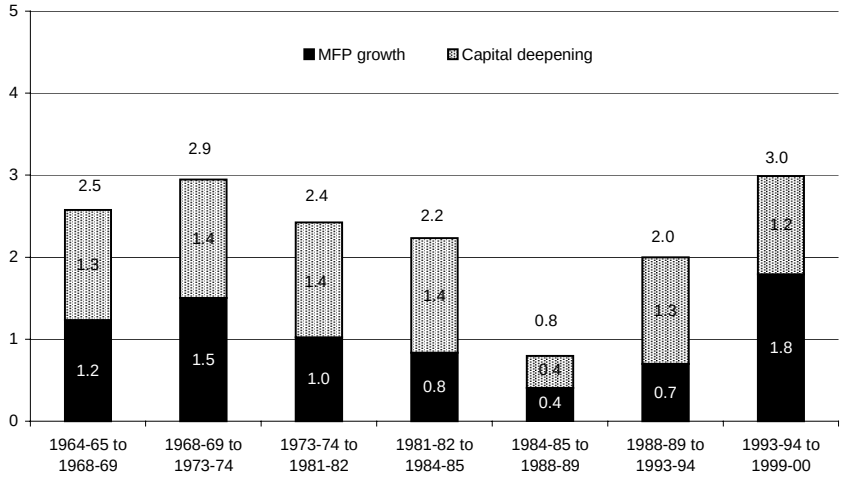
The 1990s productivity surge is quite evident in figure 1. The period from 1990-91 to the peak in 1999-2000 was the longest period of continuous positive growth in MFP on record (9 years). Clearly, the strong productivity performance was due to more than a cyclical uplift in MFP coming out of the early 1990s recession.

The surge follows two other phases in Australia's productivity growth. There was a period of strong growth, common to most high-income countries (see section 4 below), during the Golden Age of growth in the post-war period until the mid-1970s. Australia's productivity growth then slowed, again in common with many other countries.

Figure 2 shows the underlying rates of productivity growth over productivity cycles, as published by the ABS. The rate of growth in labour productivity is indicated by the height of each column. The rate of multifactor productivity (MFP) growth is indicated by the black portion at the bottom of each column. The lighter shade in the top portion of each column represents the rate of capital deepening — indicating increases in the use of capital per unit of labour.

Figure 2 **Growth in labour productivity and multifactor productivity over productivity cycles, 1964-65 to 1999-2000**

Average annual rates of growth (per cent per year)



Source: ABS 5204.0 and PC estimates.

The underlying rate of productivity growth was at a record high in the 1990s cycle. The record rate of labour productivity growth was principally due to record growth in MFP — that is, improvements in efficiency and effectiveness of resource use. MFP grew at an annual average rate of 1.8 per cent, or 1.1 percentage points higher than the previous annual average rate from the early 1980s of 0.7 per cent.

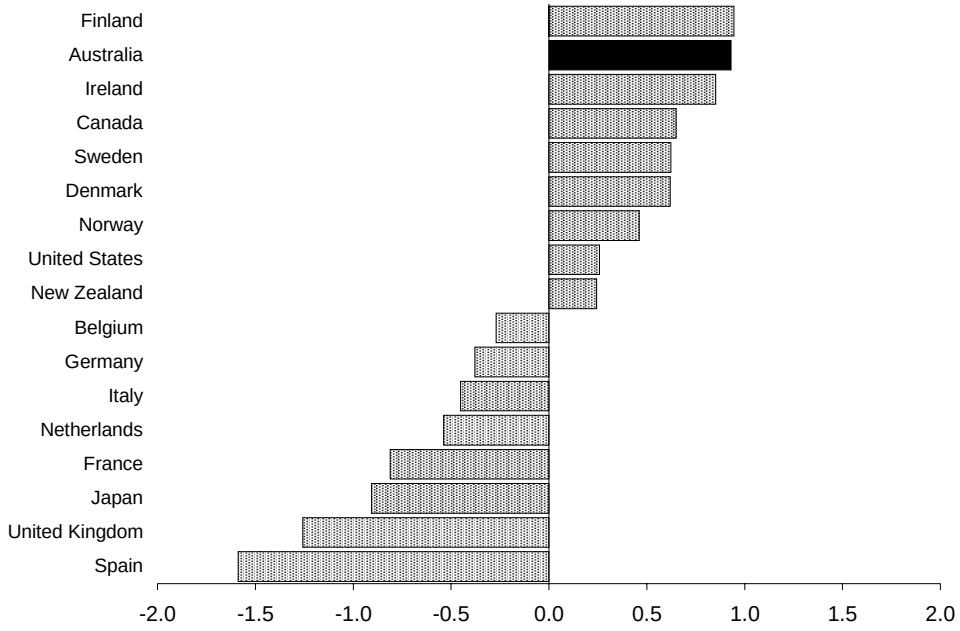
Since the focus will shift to labour productivity in section 4, it is important to note that variations in Australia's labour productivity growth are largely explained by variations in MFP growth throughout the entire period.[1]

Australia's productivity performance in the 1990s was also strong by *international* standards. Figure 3 shows that Australia was one of a group of three countries to show a strong productivity acceleration in the 1990s. It also indicates that, unlike the post-war Golden Age, there was no worldwide productivity boom in the 1990s.

[1] The capital deepening component is stable within the range of 1.2 to 1.4 percentage points in all periods except for the late 1980s, during which there was relatively strong growth in labour input.

Figure 3 **Changes in trend multifactor productivity growth in the 1990s in OECD countries**[a]

Percentage points



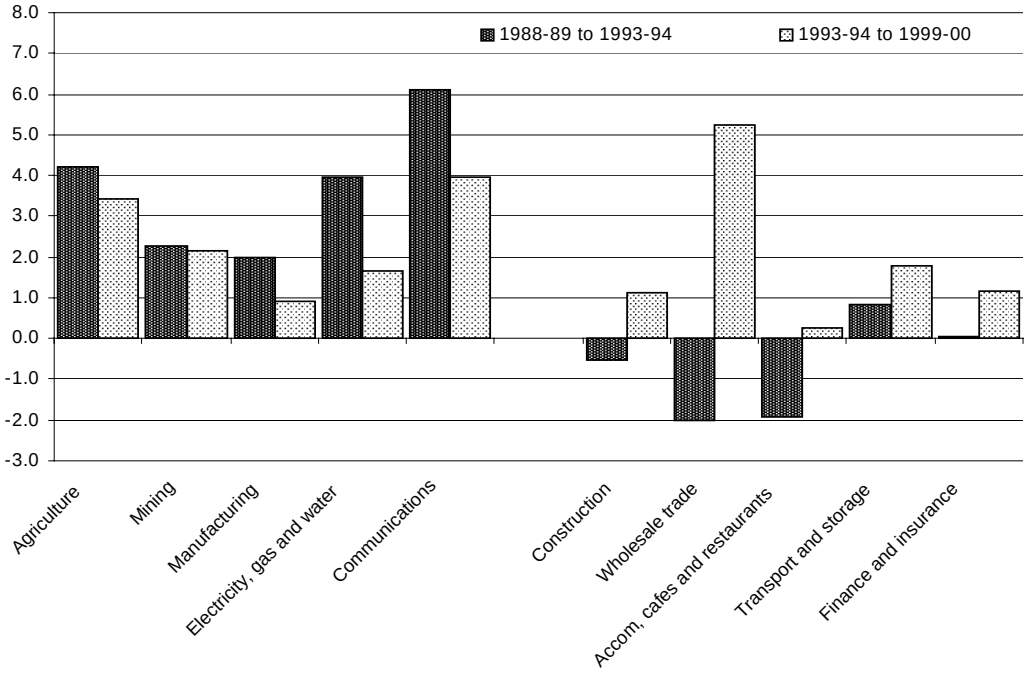
a Change in average annual rate of productivity growth from 1980-89 to 1990-99.

Source: OECD 2001a.

Figure 4 presents MFP growth rates in industry sectors over the past two productivity cycles.

In the first cycle (1988-89 to 1993-94) the relatively strong productivity growth in the 'traditional' contributors to aggregate productivity growth — Agriculture, Mining, and Manufacturing — is evident. These traditional sectors were joined in the 1980s and early 1990s by two other strong performers — Communication services and Electricity, gas & water. Their improved performance stemmed from the major reform-induced efficiencies achieved in government enterprises, which have dominated production in these areas, as well as technological advances in some activities.

Figure 4 **Industry annual average MFP growth over the last two productivity cycles, 1988-89 to 1993-94 and 1993-94 to 1999-2000**



Source: PC estimates based on unpublished ABS data.

Whilst productivity growth remained relatively strong in these industry sectors in the 1990s cycle (except for Manufacturing), they all experienced a deceleration compared with the previous cycle. None made a contribution to the productivity surge from 1993-94. (However, some caution about the precision of industry estimates is appropriate.)

There was a new set of service industries that made the positive contribution to the 1990s productivity surge. The stand-out performer was Wholesale trade. Other service industries — for example, Construction and Finance & insurance — also increased their rate of productivity growth.

Part of the success of the new service industry contributors is linked to information and communications technologies (ICTs). However, the productivity gains are being derived from the smart use of ICTs in Australia and not from the manufacture of ICTs (Parham, Roberts and Sun 2001). (The US productivity acceleration has been attributed to production and use of ICTs.)

The links between ICT use and productivity are complex. ICTs are general-purpose or enabling technologies that provide a platform for other innovations. The big productivity gains do not always come directly from ICT use, but from being

combined with product innovation and process innovation, including restructured work arrangements (Parham, Roberts and Sun 2001; Bresnahan, Brynolfssen and Hitt 2001).

3 The drivers of the productivity surge

How did this vastly improved productivity performance come to be?

As seen above, the effects of the early 1990s recession and the influence of a world-wide productivity boom can be ruled out as significant explanations. Australia's surge also predated the ICT-related productivity acceleration in the US, and was stronger and lasted longer (Parham, Roberts and Sun 2001).

The timing, strength and largely isolated nature of Australia's productivity surge point to the need for some peculiarly Australian explanations. Whilst there may be differences in degrees of emphasis, there is general agreement that microeconomic policy reforms have played a central role in Australia's productivity surge (see, for example, PC 1999, Bean 2000, Dowrick 2000, Forsyth 2000, OECD 2001b).

Turning to the question in the title of this paper, 'Are we enjoying a miracle?', I note two elements in the meaning of the term 'miracle' — first, that something remarkable has happened and, second, if the good outcome was not due to divine intervention, then there was at least a strong element of good fortune. Australia's productivity performance in the 1990s was certainly remarkable, both by historical and international standards. But, given that a central intention in introducing microeconomic reforms was to raise Australia's productivity growth, the good outcomes can be seen as 'predictable' more than 'fortuitous'.

Policy reforms were introduced in the 1980s and 1990s to redress the perhaps unintended consequences of earlier development and redistribution policies, which had locked in structural inefficiencies in the economy and had fostered resistance to change rather than a capacity to adapt to it[2] (PC 1999). Structural weaknesses meant that Australia's productivity performance and therefore growth in living standards were being held in check. Concern became acute in the 1980s when there was pessimism about the outlook for the terms of trade, strong competition from Asian

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[2] Structural weaknesses included small scale production; diversion of resources from activities with the best long-term potential to add value; inward rather than export orientation; poor investment decisions and excess manning in economic infrastructure; poor work practices, labour relations and management; outdated or inappropriate technologies, combined with low innovation and skill development; and a production culture that resisted change and showed weak commitment to performance improvement (PC 1999).

manufactures strengthened and Australia slipped further in the international league table of per capita incomes (see section 4 below[3]).

The response was not to attempt to steer the economy in a particular nominated direction. Rather, the policy reform strategy was to improve Australia's productivity performance over the long term by:

- encouraging greater flexibility in the economy so that resources could be redirected (largely by changing market circumstances) to where they would be used most effectively;
- improving efficiency and international competitiveness in individual production activities; and
- fostering a more dynamic, entrepreneurial and innovative business culture.

Microeconomic reforms have promoted productivity growth in two main ways:

- by sharpening incentives to be more productive, principally by removing unnecessary barriers to competition and giving government business enterprises more autonomy and exposure to commercial disciplines; and
- by providing greater flexibility to adapt to change and to meet the rigours of competition by, for example, removing unnecessary regulatory restrictions and introducing institutional arrangements that allow greater scope for work arrangements to be negotiated according to the needs and circumstances of individual enterprises and the reward and development of their workforces.

Greater flexibility improves the ability of the economy to deal with adverse shocks and to take advantage of positive developments that emerge unforeseen or with perhaps unanticipated importance. Two developments, apart from the good productivity outcomes themselves, illustrate the strengths in the strategy adopted. First, the increased flexibility and resilience in the economy made it better able to thrive in the midst of the Asian financial crisis (Treasury 1999). Second, Australian businesses were quick by international standards — let alone our own historical standards — to take up new technologies in the 1990s in the form of information and communications technologies and put them to good productive use (Parham, Roberts and Sun 2001, Banks 2002).

The fundamental reform drivers — incentives and flexibility — are also the drivers of the new productivity frontier — the smart use of ICTs (OECD 2001a). The Australian economy became more focused on productivity and more flexible at just

[3] The international comparisons in section 4 cover OECD countries. The public discussions at the time noted that average incomes in a number of Asian countries were rising rapidly and were starting to overtake Australia.

the right time to take advantage of the advances in ICTs that came on stream in the second half of the 1990s. The Australian economy was able to catch this second ICT-related wave of productivity growth and did so with remarkably similar timing to the ICT boom in the US economy (Parham, Roberts and Sun 2001).

Given our history, it is unlikely that Australia would have been as quick on the uptake of ICTs, or as able to use them in as productivity-enhancing ways, had it not been for the sea-change that reforms brought.

The example of Australia's Wholesale trade illustrates the synergies between reform and the uptake and smart use of technology (Johnston et al 2000). Part of the sector's very strong productivity surge in the 1990s can be attributed to the use of ICTs — for example the use of bar-code and scanning technology and inventory management systems to transform wholesaling from a storage-based to a fast flow-through operation. Part of the gains, however, are attributable to the reform of industrial relations processes that allowed greater flexibility through the introduction of split shifts and reduced the rigidity of job demarcations. It was the combination of ICTs and business transformation that generated the productivity gains. Furthermore, much of the reform-related impetus for change came from outside the sector. For example, the motor vehicle industry was looking for efficiencies all along the 'value chain', including in distribution, to meet the increased competition from cheaper imports entering under lower border protection. In other words, reforms were acting as underlying drivers and facilitators of productivity gains, which in some instances appeared from unexpected quarters.

4. Australia's productivity and prosperity in an international setting

We now turn to an international perspective to address two questions. What does the productivity surge mean for prosperity? What scope for further strong productivity growth remains?

A simple relationship can be used to illustrate just how important productivity growth is to prosperity. For this purpose, productivity is measured as labour productivity.[4] Prosperity is measured as per capita GDP — a measure subject to a

[4] The coverage of the labour productivity measure differs in this section (economywide output and hours worked) from that used in section 2 (market sector output and hours worked). The market sector measures are generally considered to be more representative of productivity trends as they exclude activities (such as government administration and defence) for which output and productivity measures are poorly defined.

number of well-known criticisms as a welfare indicator, but a meaningful and useful indicator nonetheless in what will be a broad historical and international sweep.

$$\frac{\text{GDP}}{\text{Persons}} = \frac{\text{GDP}}{\text{Hours worked}} \times \frac{\text{Hours worked}}{\text{Employees}} \times \frac{\text{Employees}}{\text{Persons}}$$

Or, in other words,

$$\text{GDP per capita} = \text{Labour productivity} \times \underbrace{\text{Average hours worked} \times \text{Employment ratio}}_{\text{Labour utilisation}} \quad (1)$$

The last two terms on the right hand side are sometimes combined and referred to (at least by the OECD 2001a) as the rate of 'labour utilisation'. This measures the extent to which the population is actively engaged in employment activity — hours worked per head of population.

A database of comparable information on OECD countries is used to examine Australia's experience in terms of this relationship and to compare Australia with other countries. The dataset was assembled by the Groningen Growth and Development Centre at the University of Groningen in the Netherlands. It draws on OECD, national accounts and other sources. GDP estimates are converted to $US at 1996 purchasing power parities. Data are available on 22 of the pre-1994 OECD member countries (Luxembourg and Iceland are not included).[5]

Table 1 uses equation (1), expressed in growth rate form, to illustrate the contributions of labour productivity growth and changes in labour utilisation to growth in per capita GDP in a number of OECD countries and groupings over the following periods:

- 1950-1960 and 1960-1973, during the Golden Age of strong post-war growth in output and productivity;
- 1973-1990, a period of generally slower growth; and
- 1990-2001, a period of varied productivity and growth performance across countries.

[5] The GGDC also collects data on other countries. However, the data on non-OECD countries tends to be less comprehensive.

Table 1 **Strong productivity growth in the 1990s pushed Australia's growth in average income to above the OECD average**

Average annual rates of growth (per cent per year)

	1950-60	*1960-73*	*1973-90*	*1990-2001*
USA				
Average income	1.70	2.98	1.94	2.04
Labour productivity	3.51	2.57	1.27	1.60
Utilisation	-1.82	0.41	0.67	0.44
Japan				
Average income	7.28	8.11	2.92	1.05
Labour productivity	5.69	8.03	2.84	1.80
Utilisation	1.57	0.08	0.08	-0.75
Australia				
Average income	1.68	2.80	1.70	2.53
Labour productivity	2.74	2.38	1.50	2.30
Utilisation	-1.06	0.42	0.20	0.22
United Kingdom				
Average income	2.24	2.54	1.83	1.87
Labour productivity	1.83	3.57	2.20	2.06
Utilisation	0.42	-1.04	-0.37	-0.19
Europe				
Average income	3.91	3.77	1.74	1.12
Labour productivity	4.10	5.00	2.38	1.74
Utilisation	-0.19	-1.23	-0.64	-0.62
OECD				
Average income	3.16	3.89	2.01	1.51
Labour productivity	3.56	4.40	2.04	1.76
Utilisation	-0.40	-0.51	-0.03	-0.25

Source: Estimates derived from University of Groningen and The Conference Board, GGDC Total Economy Database, 2002; http://www.eco.rug.nl/ggdc, accessed 7 March 2002.

Growth rates in GDP per capita and GDP per hour worked are presented for all individual countries in appendix table A1.

Labour productivity growth made the major contribution to growth in average income in all countries, groupings and periods shown. Changes in labour utilisation were small, although it is of passing interest that utilisation declined in Europe, but (mostly) increased in Australia, USA and Japan. This is explained by the stronger declines in average hours in Europe and the stronger increases in the employment ratio in the other countries (table 2).

Table 2 **Australia's increase in labour utilisation has been due to increases in the employment ratio**

Average annual rates of growth (per cent per year)

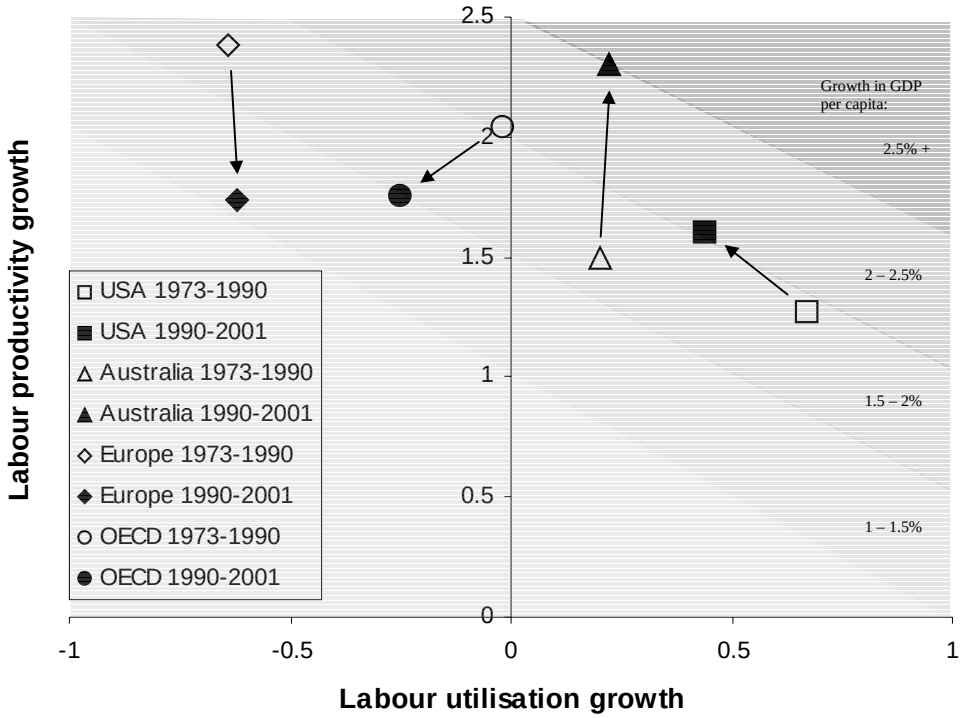
	1950-60	*1960-73*	*1973-90*	*1990-2001*
USA				
Average hours	-0.96	-0.34	-0.20	0.24
Employment ratio	-0.86	0.75	0.87	0.20
Australia				
Average hours	-0.39	-0.26	-0.24	-0.05
Employment ratio	-0.67	0.68	0.44	0.27
Europe				
Average hours	-0.27	-0.78	-0.70	-0.21
Employment ratio	0.08	-0.45	0.05	-0.41
OECD				
Average hours	-0.35	-0.56	-0.41	-0.14
Employment ratio	-0.05	0.04	0.39	-0.12

Source: As for table 1.

Figure 5 displays the contributions of labour productivity and utilisation to average income growth over the 1973-1990 and the 1990-2001 periods in Australia, the USA, Europe and the OECD.[6] The rate of growth in labour utilisation (horizontal axis) plus the rate of labour productivity growth (vertical axis) equals the rate of growth in per capita GDP (indicated at 0.5 percentage point increments by the gradations in shading).

6 Figure 5 is an adaptation of a similar type of figure presented in McGuckin and van Ark (2002).

Figure 5 **The 1990s productivity surge gives Australia comparatively strong growth in average income**



Source: As for table 1

The key message from table 1 and figure 5, as will now be explained, is that the 1990s brought a major turnaround in growth in Australia's prosperity. The surge in productivity growth meant Australia became a strong performer in both historical and international senses.

Australia's growth in average income was below the OECD average over the three intervals shown between 1950 and 1990 in table 1. Changes in utilisation were working in Australia's favour — as previously noted, increasing in Australia, but decreasing in the OECD generally. Productivity growth below the OECD average was the overwhelming reason for Australia's slower growth in average income.

This changed in the 1990s, when Australia outperformed the OECD average in both income and productivity growth (table 1 and figure 5). Growth rates increased in Australia, while they declined in the OECD as a whole. Australia was also ahead of a much-noted improver — the USA — which had a deceleration in labour utilisation to offset some of its productivity acceleration.

Increased productivity growth — 0.8 of a percentage point on these measures and periods — explained the bulk (about 96 per cent) of the acceleration in Australia's

average income growth. Increased labour utilisation contributed only 0.02 of a percentage point; but Australia's ability to maintain its growth in labour utilisation in the 1990s meant that the productivity surge translated fully into average income growth.

These results confirm the conclusion of earlier work by Parham et al (2000), who used an extension of the approach used here to relate growth in domestic income per head to growth in market sector productivity. We found that:

- since the mid-1960s, MFP growth has accounted for about half of the growth in gross domestic income[7] per head of population;
- increased MFP growth accounted for over 90 per cent of the acceleration in average income growth from 1.4 per cent a year (from the late 1970s to the end of the 1980s) to 2.5 per cent a year in the 1990s.

Levels and remaining gaps

Each of the components — labour productivity and the sub-components of labour utilisation — are now examined more closely from the international perspective to see where Australia's opportunities for generating future prosperity might lie.

Table 3 presents information on Australia's comparative *levels* in each of the variables of interest — Australia's ranking among the 22 OECD countries and Australia's level of performance as a percentage of the US level. Further details for individual OECD countries on levels, rankings and comparisons against the US in 2001 are presented in appendix table A2.

Table 3 reveals that Australia's ranking on level of GDP per capita slipped from 5 in 1950 to 15 in 1990. However, the relatively strong growth in average incomes in the 1990s raised Australia's ranking to 7 by 2001. In 2001, Australia's level of GDP per head had recovered to its very long-term relativity of around 78 per cent of the US level, after slipping to 74 per cent in 1990.

However, Australia's ranking on average income owes a lot to a relatively high level of labour utilisation. Australians have relatively high average incomes because a relatively high proportion of the population is employed (equivalent to 98 per cent of the US level and a rank of 10 among the OECD group) and those employed work relatively long hours (96 per cent of the US level and rank 6).

Relatively high labour utilisation lifts up Australia's relatively weak productivity performance. The volume of output generated in Australia per hour worked comes

[7] Gross domestic income is GDP adjusted for changes in the terms of trade.

in at 83 per cent of the US level and ranks 14 among OECD countries. *Despite strong productivity growth in the 1990s, Australia still has a sizeable productivity gap with other countries.*

Table 3 **Australia has more of a productivity gap than a labour utilisation gap**

	1950	*1960*	*1973*	*1990*	*2001*
GDP per capita					
Australia's rank	5	7	9	15	7
% of US level	78	78	77	74	78
GDP per hour					
Australia's rank	4	5	10	15	14
% of US level	81	75	74	77	83
Labour utilisation					
Australia's rank	16	17	7	7	5
% of US level	96	104	104	96	94
Average hours worked					
Australia's rank	19	18	13	8	6
% of US level	93	99	100	99	96
Employment ratio					
Australia's rank	12	15	8	12	10
% of US level	103	105	104	97	98

Source: As for table 1.

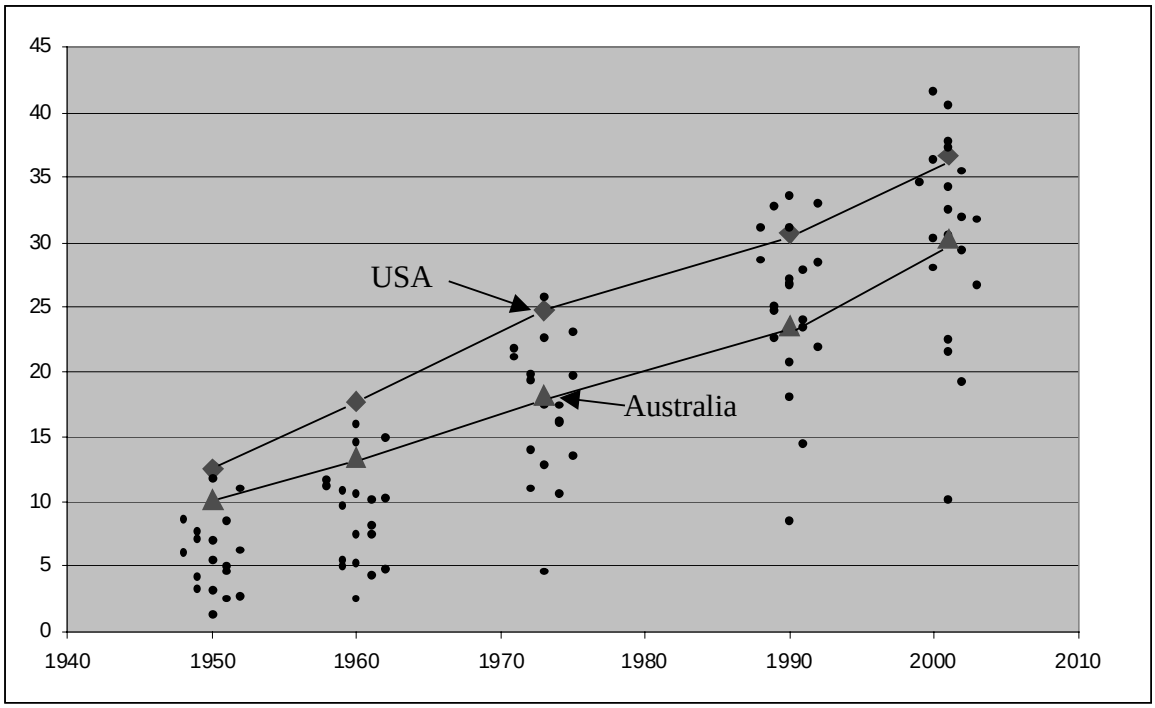
Whilst Australia has this sizeable productivity gap, is it realistic to suggest that we can close it further? After all, a productivity gap may reflect differences in resource endowments, industry mixes, geography and even climate that do not signal a productivity 'problem'.

Figure 6 suggests that there is scope for Australia to close the productivity gap with other countries, so long as it can do what other countries have done. The figure shows productivity levels in the USA, Australia and 20 other OECD countries in 1950, 1960, 1973, 1990 and 2001. (Some observations are offset from the reference year on the chart to avoid over-writing).

The figure elaborates on the message provided in table 3. In 1950, Australia's productivity level was relatively high. In the ensuing decades, many other countries started to catch up on the productivity leader, the US, and in some cases overtook it. Many countries also overtook Australia, which slipped further behind the US in the 1950s and then merely maintained its relativity with the US until 1990.

Figure 6 **Australia only started productivity catch-up in the 1990s**

Labour productivity levels ($)



Source: As for table 1.

Incidentally, the catch-up phenomenon brought an increasing measure of convergence in productivity levels across countries up until 1990, but convergence came to a standstill in the 1990s. The convergence in productivity levels across countries is indicated in table 4 by the lower variation across countries in productivity levels and the encroachment of the OECD average on the US level as the point of reference moves from 1950 through to 1990. The table also shows that convergence stalled in the 1990s, as US productivity accelerated relative to most other countries (Australia being one notable exception). Convergence actually broke down in the second half of the 1990s, when the US productivity acceleration was strongest (OECD 2001a, McGuckin and van Ark 2002).

Table 4 **International convergence on US productivity levels stalled in the 1990s**

OECD countries' GDP per hour worked[a,b]

	1950	*1960*	*1973*	*1990*	*2001*
Coefficient of variation (%)	49	44	29	24	24
OECD average as % of US level	59	59	75	85	86

a The former East Germany is included from 1990. **b** The sample of countries includes Turkey which, it could be argued, is not sufficiently developed to qualify for 'conditional convergence', However, the same general pattern is evident when Turkey is excluded from the sample.

The key point for this paper is that, whereas other countries engaged in catch-up through the Golden Age and the slowdown periods, Australia only started to catch up on the US during the 1990s. If other countries' experience in earlier decades is any guide, it is possible for Australia to close the gap further. Certainly, there is no basis for complacency after the 1990s productivity surge.

5 The productivity outlook

A further aspect to the question 'Are we enjoying a miracle?' is whether we will continue to chalk up strong productivity growth.

There was a downturn in the last available annual productivity estimate for 2000-01, after the peak in 1999-2000. But I think this will be revealed in years to come as a short-term blip. Very recent data suggest that the economy is strengthening again.

I am quite optimistic about the productivity outlook. I am certainly more optimistic than those who consider that the microeconomic reforms have delivered all the (static) gains that they are going to deliver; and that Australia is precluded from ICT-based gains because of the lack of a sizeable ICT manufacturing industry (see, for example, AiG 2000).

As set out in this paper:

- Reforms have fostered more dynamism and entrepreneurial vigour that encourage continuous and never-ending searches for further productivity improvements.
- The earlier experience of other countries suggests that there is further scope for Australia to redress the decades of languishing, even after a very strong improvement in the 1990s.
- There is scope for further ICT-related (second-wave) productivity gains based on the *use* of ICTs. With relatively high ICT use and a more flexible operating environment, Australia is better placed than many other countries to keep pace with the new US productivity acceleration, which has been associated with both the production and use of ICTs. There can be further diffusion and further product and process innovation based on the ICT platform. Australia is also well placed to gain from any e-commerce gains that may now start to come on stream (Parham, Roberts and Sun 2001).

The international perspective presented in this paper suggests that the priority for further raising Australia's prosperity should be with productivity. That is where the greatest scope for closing gaps with other countries lies. On the other path to

prosperity — higher labour utilisation — Australia is already toward the front of the international pack.

Certainly, further reductions in unemployment should remain a priority.[8] Having a job is a crucial element of opportunity in society and sharing in prosperity. But, aside from increases in employment, increases in utilisation may come at a high cost or be difficult to achieve. Longer working hours would come at what many consider to be a high cost in terms of loss of enjoyment of leisure. (Average hours worked can also be affected by the mix of full- and part-time work). And, as the population ages and a greater proportion shifts into retirement, there will be downward pressure on the employment ratio (unless there are counteracting shifts in fertility and migration).

Concerns are sometimes raised that a focus on productivity will have adverse employment and distributional consequences and will put particular adjustment burdens on some. These factors need careful consideration and it needs to be remembered that welfare and living standards, and not productivity, are the end game. Nevertheless, some aspects of these concerns can be overstated.

There is still something of a myth that productivity growth is incompatible with employment growth. This can be true at the micro level. For example, there has been labour shedding associated with productivity growth in government business enterprises. But productivity growth does not have to mean fewer jobs in aggregate (IC 1997). If anything, the relationship between productivity and aggregate employment is positive. For example, employment growth coexisted in the 1990s with record productivity growth.[9]

The 1990s strong productivity and income gains brought some adverse distributional effects, but they did not loom as large as many may have thought. (Distributional issues are considered in depth in other papers presented at this conference). Importantly, our research has shown that profits, real wages and employment all grew at the same time, with a more competitive environment ensuring that productivity gains were largely passed on in lower prices, rather than retained in excessive profits or nominal wage growth. Certainly, there were some large, visible increases in remuneration of chief executives and some finance and IT professionals. But this has not translated into shifts in earnings relativities at large.

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[8] Reductions in unemployment may reduce productivity growth from what it might otherwise be if, as is likely, workers with relatively low marginal products are drawn into the workforce. This would make for a more complicated assessment of net welfare effects.

[9] Nevertheless, the fact that productivity-enhancing developments (policy-induced and otherwise) can affect employment opportunities in particular occupations, industries and regions does raise the spectre of adjustment costs. For a discussion of adjustment issues, see PC 2001.

Adverse movements in the distribution of 1990s earnings were continuations of 1980s trends and seem to have been counteracted to a large extent in terms of disposable personal and household incomes by government social policies (box 1).

Box 1 **Distribution of the 1990s gains**

The distribution of income, and not just the growth in average income, is important in terms of opportunity and sharing in prosperity. Parham et al (2000) examined some distributional elements associated with the productivity and income gains of the 1990s. We found that:

- the increased income associated with the productivity surge was distributed evenly between labour and capital at the aggregate level;
  - labour and capital shares in economywide income remained stable throughout the 1990s;
- the strong productivity growth enabled a simultaneous increased in profits, real wages and employment;
  - the rate of employment in the working-age population (15 years and over) returned to near record levels;
- more of the productivity gains at the industry level were passed on in the form of lower prices in the 1990s;
  - this is consistent with stronger competition in the 1990s, which not only encouraged productivity growth but also benefited consumers.

A review of other research for that paper suggested that, notwithstanding the even distribution between labour and capital, the distribution of earnings among individuals became more unequal in the 1990s. However, the increase was a continuation of the growth in earnings inequality during the 1980s, rather than a step up in the 1990s. Payments to skilled workers increased (from around 37 per cent of total payments in the mid-1980s to around 42.5 per cent in the late 1990s), at least partly associated with an ICT-related technological bias toward skilled labour.

Whilst there has been a shift in the distribution of earnings toward skilled workers, the shift has occurred principally through increases in the relative numbers of skilled workers, rather the increases in the relative wages of skilled workers. Certainly, there have been some much more rapid remuneration increases for CEOs and finance, communications and IT professionals. But they apparently have not been on sufficiently broad scale to show up in wage premiums for broadly-defined skill-group.

On the other hand, it appears that the tax and transfer system had been reasonably effective in counteracting any biases, leaving a much less marked impact on the distribution of disposable income amongst individuals and households. Just how effective is a little unclear. ABS published figures tend to suggest there has been little change in inequality, whereas NATSEM research (especially more recent papers, such as Harding and Greenwell 2001) is now more equivocal.

In closing, it is worth emphasising that Australia did not get the benefits of strong productivity growth by virtue of a miracle. It came from a policy commitment to reinvigorate productivity and income growth in the Australian economy. The continuation of the commitment to incentives and flexibility will see Australia catch up further on the ground lost over earlier decades and keep up on the second ICT-related wave.

As Banks (2002) noted, labour reforms will remain of central importance. As Australia completes the catch-up process, innovation will be more important to our continuing progress. This will depend on the qualities and attitudes of Australian managers and workforces, which in turn largely depend on the effectiveness of our education and training systems.

Productivity growth is not everything. But it is difficult to provide substantial improvement in opportunity and prosperity without it. In promoting continued strong productivity growth, we cannot ask for miracles.

Appendix tables

Table A1 **Growth in average income and labour productivity in OECD countries**

Annual average rates of growth (per cent)

	GDP per capita			*GDP per hour worked*		
	1950-73	*1973-90*	*1990-2001*	*1950-73*	*1973-90*	*1990-2001*
North America/Pacific						
USA	2.42	1.94	2.04	2.98	1.27	1.60
Japan	7.75	2.92	1.05	7.01	2.84	1.80
Canada	2.70	1.84	1.16	2.82	1.07	1.08
Australia	2.31	1.70	2.53	2.54	1.50	2.30
New Zealand	1.71	0.59	1.40	na	na	0.78
Europe						
Germany[a]	4.59	1.57	1.19	5.43	2.29	2.22
France	3.97	1.89	1.33	4.98	3.06	1.19
UK	2.41	1.83	1.87	2.81	2.20	2.06
Italy	4.83	2.51	1.42	5.01	2.51	1.79
Spain	5.63	1.97	2.25	6.21	3.38	1.10
Netherlands	3.41	1.63	2.06	4.27	1.55	0.96
Turkey	3.15	2.19	0.95	5.29	3.51	1.66
Belgium	3.48	2.03	1.75	4.37	3.08	2.14
Sweden	3.02	1.59	1.35	4.06	1.35	1.72
Austria	4.82	2.40	1.68	5.74	2.73	2.22
Switzerland	3.03	1.01	0.33	3.21	1.23	0.98
Greece	6.03	1.56	1.97	6.21	2.00	1.64
Portugal	5.51	2.30	2.39	6.26	1.78	2.66
Denmark	3.03	1.65	1.84	4.02	1.63	1.72
Norway	3.14	2.92	2.63	4.15	3.21	2.41
Finland	4.17	2.47	1.65	5.10	2.30	2.59
Ireland	3.00	3.20	5.88	4.22	4.26	4.29
Europe total	**3.83**	**1.74**	**1.12**	**4.61**	**2.39**	**1.74**
OECD total	**3.57**	**2.02**	**1.51**	**4.04**	**2.04**	**1.76**

na not available. **a** Includes the former East Germany from 1990.

Source: Estimates derived from University of Groningen and The Conference Board, GGDC Total Economy Database, 2002; http://www.eco.rug.nl/ggdc, accessed 7 March 2002.

Table A2 **Levels of average income and labour productivity in OECD countries, 2001**

	GDP per capita			*GDP per hour*			*Contributions to the difference between (A) and (B) due to*	
	1996 US$	*% of US*	*Rank*	*$*	*% of US*	*Rank*	*Hours worked*[a]	*Employment ratio*[b]
		(A)			(B)			
North America/Pacific								
USA	33271	100	1	36.67	100	5	0	0
Japan	24267	73	11	26.64	73	18	-3	3
Canada	25923	78	6	30.53	83	13	-4	-2
Australia	25818	78	7	30.32	83	14	-3	-2
New Zealand	18560	56	19	22.49	61	19	-4	-2
Europe								
Germany	23183	70	14	34.20	93	9	-17	-7
France	23176	70	15	37.63	103	3	-18	-15
UK	22696	68	17	29.40	80	16	-10	-2
Italy	22991	69	16	32.53	89	10	-11	-8
Spain	18755	56	18	27.98	76	17	-2	-18
Netherlands	24989	75	9	37.32	102	4	-29	2
Turkey	5933	18	22	10.16	28	22	1	-11
Belgium	25252	76	8	41.54	113	1	-19	-18
Sweden	23636	71	13	30.22	82	15	-11	-1
Austria	24828	75	10	35.46	97	7	-18	-4
Switzerland	27236	82	4	31.73	87	12	-13	8
Greece	15696	47	21	21.64	59	20	2	-14
Portugal	16578	50	20	19.28	53	21	-3	0
Denmark	26857	81	5	34.58	94	8	-17	3
Norway	27940	84	2	40.55	111	2	-29	3
Finland	23795	72	12	31.92	87	11	-11	5
Ireland	27318	82	3	36.36	99	6	-9	-8
Europe total	20196	61		29.59	81		-10	10
OECD total	25037	75		31.60	86		-6	-5

a Percentage point difference between GDP per person employed and GDP per hour worked as a percentage of US levels. A negative (positive) means that fewer (more) hours are worked on average in the country concerned, compared with the US. **b** Percentage point difference between GDP per capita and GDP per person employed as a percentage of US levels. A positive (negative) means that the employment ratio is higher (lower) in the country concerned, compared with the US.

Source: As for table A1.

Note: The same table (re-ordered) appears in McGuckin and van Ark (2002). However, the table presented here contains updated estimates.

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