

Is Australia's Productivity Surge Over?

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Australia's productivity growth surged in the 1990s. Growth in both labour productivity (output per hour of labour input) and multifactor productivity (output per combined unit of labour and capital) lifted to record highs between 1993-94 and 1998-99 (Australian Bureau of Statistics, 2004).

However, there have been signs that Australia's productivity growth has since slowed. The average rate of productivity growth is down markedly — although it still falls into line with the historical average. With declines in recent quarterly productivity estimates, some commentators have declared that Australia's productivity surge is now confirmed as over.

That productivity growth would come off its record highs could well be expected. But does the evidence now available signal that Australia's productivity growth has 'permanently' dropped to unremarkable rates, somewhere around the long-term historical average or even below?

The issue matters. A substantial and long-lasting drop in productivity growth would mean less growth in a major foundation for improvement in Australian living standards. From a policy point of view, it is now generally accepted that a series of policy reforms played an important role in driving and enabling the lift in productivity performance in the 1990s. A transitory surge would imply that the productivity payoff from policy reforms — whilst significant — has come as a 'step-up in levels' effect, rather than as a long-term increase in the rate of growth. Such a view has led some commentators to call for further policy reforms in order to reinvigorate productivity growth.

This article presents a preliminary and partial examination of the topography of the productivity slowdown and the factors that have contributed to it. The objective is to determine whether or not Australia's experience of generally stronger productivity growth has drawn to a close.

Framework and Focus

Productivity growth in the 2000s has not received as much attention as that of in 1990s. Most analysts and commentators have been reluctant to consider the average rate of productivity growth since 1998-99 as a true 'underlying' rate, given an important ABS convention adopted to abstract from volatility in annual productivity. The Bureau calculates underlying productivity growth as the average annual rate between peaks in productivity cycles (points where the level of multifactor productivity (MFP) reaches a local high above a calculated trend series). Although MFP reached a new high above trend in 2003-04, the ABS did

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not declare that year as a peak because the endpoint of the upswing had not been established. And so the productivity cycle has not been viewed as complete.

However, for this article, 1998-99 to 2003-04 will be taken to be a complete cycle. Based on more recent information, it looks probable that 2003-04 will turn out to be a peak. The recent quarterly estimates provide a sufficient indication that productivity in 2004-05 is unlikely to be any higher above trend than the 2003-04 estimate. A qualification, which affects the level if not the existence of the peak, is that the 2003-04 estimate is likely to be revised in the next annual national accounts release.

This article focuses very heavily on the slowdown in underlying rates of productivity growth between the 1990s cycle and this latest cycle. The recent quarterly estimates do not provide a basis for assessment of trends. However, a few brief remarks about them are made in a later section, in view of the attention they have received.

The principal question addressed, whether Australia's productivity surge is over, is subject to some debate and speculation. Some take the 1990s productivity surge to have been unsustainably high and so expect that a slowdown would inevitably follow at some stage. Others think that the slowdown is more the result of a series of short-term shocks, such as drought, that have held productivity growth back in the 2000s, but only in a temporary fashion.

To help distinguish between short-term fluctuations and structural shifts, the year-to-year movements in productivity over the two cycles are also examined. Some short-term effects have no influence on underlying rates of growth. A drop in productivity growth in a recession is often counterbalanced, in terms of a cycle average, by a productivity spike in the immediate recovery. However, a short-term effect that is not counterbalanced in this way would exert an influence on the cycle average.

The approach is to examine the immediate or proximate factors that have contributed to the productivity slowdown — the contours of change in growth in inputs and outputs and in industry contributions to aggregate productivity growth. For reasons that will become clear, attention is focussed primarily on growth in MFP rather than labour productivity. Changes in the relationship between input growth and output growth are examined as proximate contributors to the MFP slowdown.

The direction of causality needs clarification. MFP growth is usually viewed as affecting output growth and not the other way round. For example, MFP-enhancing innovation expands the production possibilities that can be generated from available resources. In the short term, however, causality can run in the other direction, with variations in output or input growth influencing MFP growth. For example, the proximate cause of an MFP drop during a recession is that output falls, while businesses maintain some excess labour and capital capacity. Alternatively, a build up of inputs that is not matched by output growth can also reduce MFP growth in the short-term. For example, large investments in capital (such as in mining) may slow MFP growth in the short term, even though investors expect improved efficiency or additional output over the long term. As

another example, businesses may choose or be forced to use less efficient, perhaps labour-intensive, methods to satisfy a surge in demand in the short term, if they perceive that surge to be only temporary, or if they had not anticipated its strength and have a shortfall in capital capacity in the short run. The important point is that it is possible and important to distinguish between, on the one hand, fluctuations in MFP growth that are associated with short-term changes in output or input growth and, on the other hand, shifts in MFP growth that reflect a change (usually over the longer term) in the output yield from input use.

A relationship between labour productivity growth and MFP growth is used in the assessment. To see this relationship, first consider a production function in which output (Y) is a function of capital (K), labour (L) and MFP:

$$Y = f(K,L) \cdot \text{MFP}$$

Rearranging, labour productivity becomes a function of the capital-labour ratio and MFP — that is, $Y/L = f'(K/L,1) \cdot \text{MFP}$. This relationship is usually expressed in growth terms as labour productivity growth equals capital deepening plus MFP growth. (See Table 1 for empirical verification.)

Finally, the assessment is based on ABS estimates of aggregate productivity and compatible estimates of industry productivity released by the Productivity Commission. The official ABS estimates cover the 'market sector' of the economy (the major part of the economy for which productivity can be more accurately measured) and exclude such areas as health, education, defence and public administration. An index number methodology is used to calculate productivity, with a value-added measure of output, a capital services measure of capital and an hours worked measure of labour. It should be noted, however, that the industry estimates are likely to be less accurate than the market sector estimates because of greater data measurement error. (For more details on productivity measurement, see Australian Bureau of Statistics, 2000).

An Aggregate Perspective on Productivity Trends

Bearing in mind that there could be revisions to the current figures, the estimates reveal a very substantial slowdown in underlying productivity growth. Average annual growth in both labour productivity and MFP has fallen by around one percentage point (ppt). For ease, 1993-94 to 1998-99 will be referred to as 'cycle 1' and 1998-99 to 2003-04 as 'cycle 2'. Growth in labour productivity slowed by 0.9 ppt to 2.3 per cent a year over cycle 2 (Table 1), which is on a par with the historical average from the mid-1960s of 2.4 per cent a year. MFP growth slowed by 1.0 ppt to 1.0 per cent a year in cycle 2, which is a little below the historical average of 1.2 per cent a year.

Attention is now focused on MFP growth, as it is the source of the productivity slowdown. Since the rate of capital deepening was steady on average over the two cycles, the slower average labour productivity growth over cycle 2 is entirely attributable to slower average MFP growth (Table 1). Although not

shown here, the year-to-year differences in labour productivity growth and MFP growth are not that large and occur mostly in cycle 1 and so have little bearing on the slowdown in cycle 2. Discussion will return to labour productivity later in the context of quarterly estimates.

Table 1: Average Annual Growth in Output, Inputs and Productivity Over the Last Two Productivity Cycles

	<i>Cycle 1^a</i>	<i>Cycle 2^b</i>	<i>Change</i>
	<i>per cent per year</i>		<i>percentage points</i>
1. Output growth [= 2 + 3]	4.6	3.2	-1.4
2. Input growth [= $s_l \cdot 2a + s_k \cdot 2b$] ^c	2.6	2.2	-0.4
• 2a. Labour growth	1.3	0.9	-0.4
• 2b. Capital growth [= $s_{it} \cdot 2b(i) + s_{nit} \cdot 2b(ii)$] ^d	4.4	4.0	-0.4
2b(i). IT growth	23.8	25.7	1.9
2b(ii). Non-IT growth	2.2	1.9	-0.3
3. Multifactor productivity growth	2.0	1.0	-1.0
4. Capital deepening [= $s_k \cdot (2b - 2a)$] ^c	1.3	1.3	0.0
5. Labour productivity growth [= 3 + 4]	3.2	2.3	-0.9

Notes: *a* 1993-94 to 1998-99.

b 1998-99 to 2003-04.

c s_l = labour's share in total factor payments. s_k = capitals' share in total factor payments.

d s_{it} = IT capital's share in total factor payments. s_{nit} = Non-IT capital's share in total factor payments.

Source: Estimates based on ABS National Accounts.

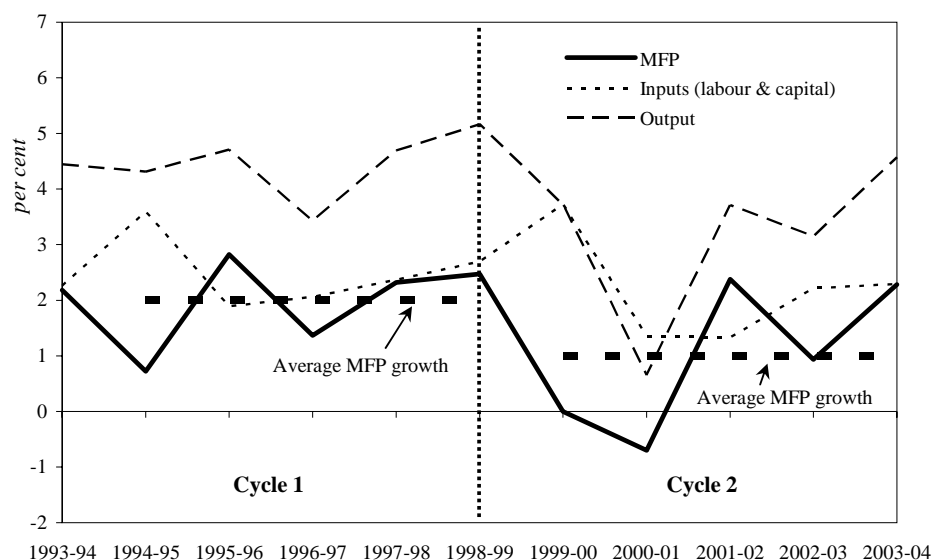
In terms of cycle averages, the slowdown in MFP growth was associated with weaker output growth. Market sector output grew at a 1.4 ppt slower rate in cycle 2 (Table 1). A deceleration in input growth of 0.4 ppt — evenly spread between labour and capital — was in a direction that would have raised MFP growth, had output growth remained the same. In comparison to long-term averages, cycle 1 could be characterised as showing high growth in output and inputs, while cycle 2 was about average on both.

In terms of year-to-year MFP changes, the main difference between the two cycles came in just two years — 1999-2000 and 2000-01 — when MFP growth fell to unusually low rates of zero and -0.7 per cent respectively. These two years pulled down the cycle 2 average because there was no compensating and unusually-high growth in any other year in the cycle (Figure 1).

A short-term rise in input growth, as well as falls in output growth, contributed to the weak MFP results over these two years. The weak result in

1999-2000 was due to unusually-high input growth of 3.8 per cent (which compares with the historical average of 2.2 per cent a year) in the presence of weaker, but not unusually-low, output growth. (It must be said, though, that there was similar input growth in 1994-95. It was additional growth in labour, after a period of 'jobless recovery' from the early-1990s recession.) The negative MFP growth in 2000-01 was associated entirely with a sharp drop in output growth to an unusually-low rate of 0.7 per cent (which compares with the historical average of 3.3 per cent a year).

Figure 1: Year-to-Year Growth in Output, Inputs and MFP



Source: Estimates based on ABS National Accounts.

The additional growth in inputs in 1999-2000 was principally additional labour (but this time from a bigger base of employment). Hours worked in the market sector grew by 2.7 per cent (historical average 1.0 per cent). There was also an increase in capital accumulation to 5.4 per cent (historical average 4.1 per cent). Part of the increased capital growth came from a jump in information technology capacity.

Finally, to reinforce the finding that two aberrant years had a substantial effect on the cycle 2 average, note that a pattern of output and input growth — and therefore MFP growth — roughly similar to that in cycle 1 had resumed by the end of cycle 2. Input growth resumed a similar growth pattern in 2002-03. Output growth did not resume its former strength until 2003-04 although, as is discussed below, drought wiped nearly 2.0 ppts off market sector growth in 2002-03 through a drop in agricultural output.

An Industry Perspective

Seven industries contributed to the cycle to-cycle decline in market sector MFP growth. They are listed in order of contribution to the change in market sector average MFP growth in Table 2.

Table 2: Industry Contributions to MFP Growth Slowdown

	<i>MFP growth</i>				<i>Change in growth (Cycle 2-1)</i>			
	<i>Cycle 1^a</i>	<i>Cycle 2^b</i>	<i>Change</i>	<i>Contributions to aggregate change^c</i>	<i>Output</i>	<i>Input</i>	<i>Labour</i>	<i>Capital</i>
	<i>per cent per year</i>		<i>percentage points</i>		<i>percentage points</i>			
Wholesale trade	6.0	2.7	-3.4	-0.33	-2.6	0.8	0.3	2.6
Finance & insur.	2.0	0.1	-1.8	-0.24	-1.4	0.6	0.2	..
Communication	4.7	-0.5	-5.2	-0.22	-7.1	-1.6	-1.5	-1.4
Elect, gas & water	1.5	-2.3	-3.8	-0.16	-0.7	3.2	8.5	0.9
Mining	0.1	-1.6	-1.7	-0.13	-2.1	0.4	3.5	-1.9
Construction	2.3	1.3	-1.0	-0.11	-0.8	0.3	1.1	-1.3
Agriculture	4.2	3.9	-0.3	-0.04	-2.3	-1.9	-3.2	-1.5
ACR ^d	0.9	0.9	0.0	0.0	-1.4	-1.4	-0.9	-3.3
Transpt & storage	2.3	2.6	0.3	0.01	..	-0.4	-1.1	0.9
Retail trade	1.4	1.8	0.4	0.02	..	-0.3	-0.1	-0.8
CRS ^e	-3.1	-0.3	2.8	0.09	-0.4	-3.4	-2.6	-4.9
Manufacturing	0.5	1.3	0.8	0.13	-0.2	-1.0	-1.9	0.1
Market sector	2.0	1.0	-1.0	-1.0	-1.4	-0.3	-0.4	-0.4

Notes: *a* 1993-94 to 1998-99.

b 1998-99 to 2003-04.

c Change in industry MFP growth rates, multiplied by the industry's share in market sector value added. Subject to rounding, contributions sum to the market sector total.

d Accommodation, cafes and restaurants.

e Cultural and recreation services.

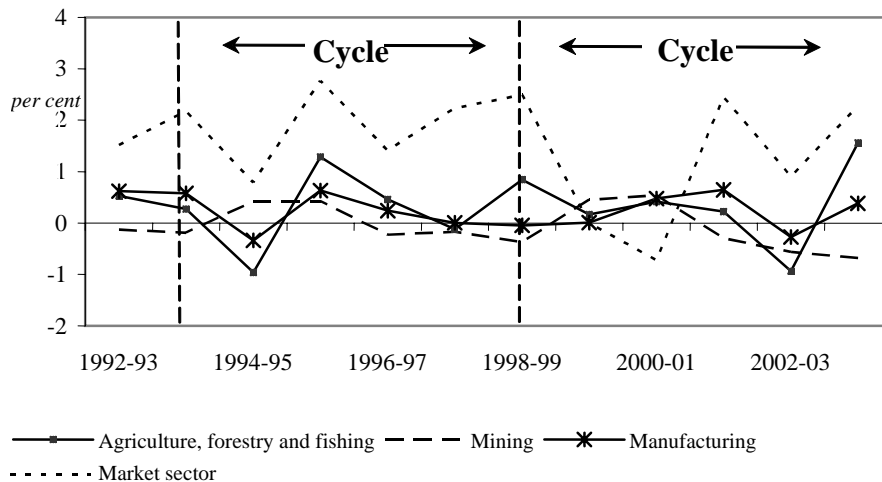
.. indicates less than ± 0.1 percentage point.

Source: Estimates based on Productivity Commission (2004a).

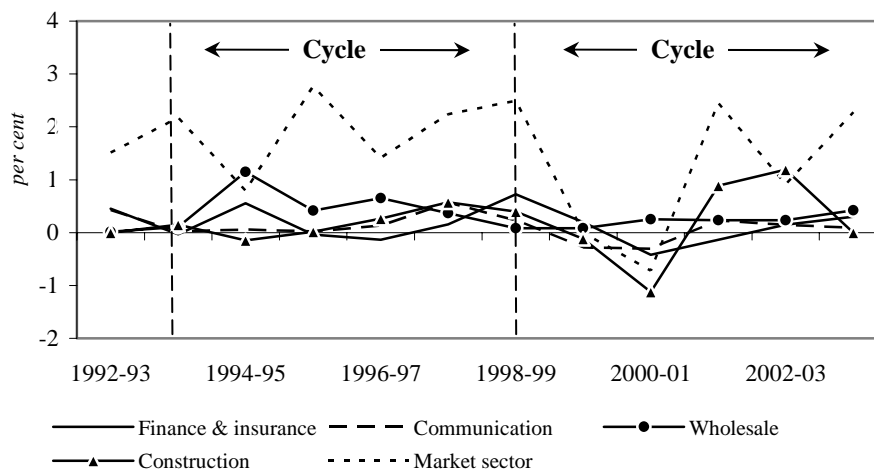
On a year-to-year basis, the falls in MFP growth in 1999-2000 and 2000-01 were concentrated in Construction (especially), Finance and insurance, and Communication services (Figure 2B). The contribution of Accommodation, cafes and restaurants (ACR) also dipped negative in these two years, clipping 0.1 ppt off yearly market sector MFP growth.

Figure 2: Industry Contributions to Year-to-Year Growth in Market Sector MFP

Panel A



Panel B



Source: Estimates based on Productivity Commission (2004a).

An investigation of the cycle-to-cycle and year-to-year patterns has identified five proximate reasons for the productivity slowdown at the industry level. These are now outlined.

Major effect of input and output ‘shocks’ on productivity in some industries

The Construction industry featured prominently in the input build in 1999-2000 (through additional labour) and was the epicentre of the 2000-01 output shock (Table 3). MFP declined in 1999-2000 and very heavily in 2000-01. The 12.7 per cent decline in 2000-01 was equivalent to wiping 1.1 percentage points off market sector MFP — almost an entire year’s growth at the historical average rate. The strong effect on aggregate MFP growth is illustrated in Figure 2.

The Communication services industry was the centre of the input build in 1999-2000 (through both labour and capital) and was also affected by the output shock in 2000-01 (Table 3). There was a huge spike in growth in information technology capacity in 1999-2000, accounting for a third of the 10 percentage point increase in market sector growth. MFP growth dropped to lows of -5.8 and -6.3 in 1999-2000 and 2000-01.

Finance and insurance also faced an input build and an output decline, but over slightly longer than the ‘shock’ years. Output growth slid from its 1998-99 peak to a trough in 2000-01. Input growth peaked in 1999-2000, but remained strong through to at least 2001-02. MFP growth was very strong in the industry in 1998-99 (5.7 per cent), but started to slide thereafter until it fell into negative territory in 2000-01 (Table 3) and again in 2001-02. The 2000-01 low, in particular, had a strong influence on the lower average in cycle 2.

Table 3: Output, Input and Productivity Growth in Industries Affected by the Input and Output Growth Shocks

	<i>Construction</i>	<i>Communication services</i>	<i>Finance & insurance</i>	<i>Wholesale trade</i>	<i>Accom, cafes & restaurants</i>
<i>Output growth</i>					
			<i>per cent</i>		
1999-00	6.0	4.9	6.2	4.9	4.8
2000-01	-14.9	0.8	2.1	-0.3	3.7
Historical ^a	3.0	6.9	4.3	2.6	2.9
<i>Input growth</i>					
1999-00	7.1	10.8	4.7	4.0	7.6
2000-01	-2.2	7.3	5.2	-3.0	6.5
Historical ^a	2.0	2.8	4.4	1.4	3.5
<i>MFP growth</i>					
1999-00	-1.1	-6.0	1.5	0.9	-2.8
2000-01	-12.7	-6.5	-3.1	2.7	-2.7
Historical ^a	1.0	4.1	-0.1	1.2	-0.6

Note: *a* Average annual rate of growth 1974-75 to 2003-04.

Source: Estimates based on Productivity Commission (2004a).

Wholesale trade has been subject to a longer-term shift (see below), but was also part of the large input and output variations in the early 2000s. The additional input build was mostly in the use of labour. Even though the industry experienced an output drop in 2000-01, a larger drop in inputs (mostly through labour shedding) prevented a fall in industry MFP growth in that year. Wholesale's weakest MFP growth was in 1998-99 and 1999-2000 (0.9 per cent in both years).

Even though ACR is a relatively small industry, it featured very prominently in the aggregate input build in 1999-2000 and, to a lesser extent, the aggregate MFP declines in 1999-2000 and 2000-01. After a strong result in 1998-99 (5.1 per cent), MFP growth dropped to negatives in 1999-2000 and 2000-01 (Table 3). The decline appears to have been the result of capacity increases (a step up in capital growth) in the lead-up to 2000 that were subsequently under-utilised as output growth dropped from a peak of 8.6 per cent in 1998-99. There was also additional labour growth in 1999-2000 and 2000-01.

Apparent structural shift to lower productivity growth in two industries

As mentioned, there appears to have been a shift down in productivity growth in Wholesale trade. Productivity growth surged in the mid-1990s as wholesaling underwent a transformation from storage-based operations to transport-based logistics (Johnston *et al*, 2000). But the average annual rate of MFP growth fell from 6.0 per cent in cycle 1 to 2.7 per cent in cycle 2. Much of that decline can be explained by a drift down from a cycle 1 high of 13.7 per cent in 1994-95, in addition to the cycle 2 low in 1999-2000 (see above). The unusually good year for MFP growth in 1994-95 was based on a combination of unusually-high output growth and a cutback in input use. The subsequent slowdown in MFP growth was associated with a combination of weaker output growth and stronger input growth.

Wholesale MFP growth has, however, recovered from its lows in 1998-99 and 1999-2000. MFP growth ran at around 2.7 per cent for three years from 2000-01 and increased to 4.6 per cent in 2003-04.

The Communication services industry may also be subject to a structural shift. The industry showed the largest absolute drop in average annual MFP growth — from 4.7 per cent in cycle 1 to -0.5 per cent in cycle 2. Whilst it has been subject to quite dramatic short- and medium-term changes, including the input and output shocks in cycle 2 (see above), there has been a shift in output growth. In cycle 1, output growth was very strong and steady at around 10 to 11 per cent each year. Aside from a low in 2000-01, output growth was more in the range of 3 to 6 per cent in cycle 2.

Even with the apparent shift in output growth, productivity growth in Communications has returned to positive and more stable and strong territory. Annual MFP growth was in the range of 2 to 5 per cent in the last three years of cycle 2.

Slower productivity in two industries 'in transition'

The Electricity, gas and water (EGW) and the Mining industries have been going through phases that are more input intensive (especially in the use of labour) and that have not been met, at least to 2003-04, by additional output growth.

Productivity growth in EGW had been strong since the 1980s. However, in 1998-99, MFP growth turned negative (associated with a marked shift upward in input growth) and has remained there since. Average annual MFP growth dropped from 1.5 to -2.3 per cent in cycles 1 and 2 respectively. Additional labour growth, which has been consistently strong since 2000-01, has been the major development. Although it might be tempting to view this as a correction for an overshoot in earlier reductions in excess manning, the recent growth in labour input has been concentrated on skilled labour, whereas the earlier reductions were concentrated on unskilled labour.

MFP growth in Mining turned negative from 2001-02 and was quite strongly so in 2003-04. Output and input growth have taken divergent courses in the 2000s. Output growth has declined progressively from a high in 2000-01, whereas input growth (predominantly labour) has increased progressively since an industry rationalisation and input cutback in 1999-2000.

Effect of output shocks in Agriculture

MFP growth in Agriculture is strong, on average. There was only a small difference in the annual average rates in the two cycles — 4.2 per cent a year in cycle 1 and 3.9 per cent a year in cycle 2. But agricultural productivity can be subject to large year-to-year variations because of climatic factors, and such variations were evident in both cycles. In cycle 2, drought led to a drop in agricultural output in 2002-03 of 24 per cent and this took 1.8 ppts off what would otherwise have been very strong growth in market sector output. Whilst there was also a cutback in inputs in that year, Agriculture took 0.9 ppt off market sector MFP growth. Output bounced back in 2003-04, with good grain harvests, and MFP growth bounced back with it.

Deeper Influences on Productivity Growth

The tour of proximate influences has pointed to three more observations about factors that have contributed to the productivity slowdown. The first is that the influences have been industry-specific or industry-concentrated. The most generalised effects have come from the input and output shocks. Even here, the effects were confined to a sub-set of industries and, in particular, Construction and Communications.

The second observation is about the factors that brought about the short-term shocks. There are three likely 'drivers' of the input and output shocks around the turn of the century that have operated either individually or severally in the affected industries: the introduction of the GST, the Sydney Olympics and concern prior to the year 2000 about the Y2K bug. It is likely that they brought some

combination of: a build-up in capacity that then lay under-utilised; a time-shift in some major expenditures that accentuated a 'boom and bust'; and some adjustment costs. The epicentre of the output shock was the Construction industry, which is widely considered to have been affected by the introduction of the GST and, to some extent, the Olympics. The construction 'boom and bust' could well have sent ripples on to Wholesale trade (which distributes building materials) and Finance and insurance, although there may have also been effects from softer Retail activity. Communications may have been affected by the Sydney Olympics and concern about the Y2K bug, and capacity in ACR was installed to meet the Sydney Olympics and anticipated expansion in tourism. The introduction of the GST could also have fed demand for computer and accounting systems and could have brought adjustment costs.

But the extent to which short-term shocks affect productivity growth also depends on the economy's resilience. A large part of the greater economic stability since the early 1990s has been attributed to a combination of better macro management and more flexibility in the micro economy which facilitates adjustment to change. It is not that shocks were absent in the 1990s, as the 1997 Asian financial crisis exemplifies. The question then arises as to why the economy was not so resilient to the early 2000s shocks. The specific nature of the shocks would seem to be important. It may be that the authorities did not anticipate the magnitude or concentration of their effects; or, because of their short sharp and specific nature, they could not be offset with traditional instruments without longer-term adverse consequences. (Some specific measures introduced helped to stem the short-term decline in construction activity.)

Would it be reasonable to discount the shocks and their effects from an assessment of the productivity growth 'trajectory' in cycle 2? The grounds for discounting the input and output shocks seem strong. The drivers mentioned above are 'one-off', atypical factors that are unlikely to be repeated. The grounds for discounting the effects of drought on agriculture are weaker. Climatic influences are not atypical or unlikely to be repeated.

The third observation concerns the interpretation of the transitional productivity performance in Mining and EGW. The slowdown in Mining MFP appears to be part of a pattern of long-term ebb and flow as the industry goes through phases of investment in exploration and development, on the one hand, and tapping known reserves, on the other. These swings are driven more by world commodity markets than by domestic economic conditions. Periods of negative MFP growth arise but, on commercial grounds, they do not persist over the long term. The decline in output growth since 2000-01 has apparently been due to a decline in oil production from maturing fields, which has outweighed the strong growth in production of some minerals in recent times (Australian Bureau of Agricultural and Resource Economics, 2004). The growth in inputs has been predominantly labour and is associated with a shift in activity toward coal and metal ore and toward opening up new operations.

Although EGW appears to also be in some transition, there is not readily-available information to answer the question, 'To what?' There are several

possibilities. But the magnitudes of the input and MFP shifts suggest that the industry is in transition to another way of operating that relies more on skilled labour. In a more competitive and commercial environment, the industry presumably expects to get a payoff from through growth in output and income.

A complete analysis of reasons for the productivity growth slowdown would also cover other 'traditional' contributors to productivity growth. Whilst this is beyond the scope of this paper, a place to start would be to look for evidence of a reversal in factors that were considered responsible for the 1990s surge. A review of studies of Australia's productivity surge (Parham, 2004) reinforced the importance of investment in physical and human capital to long-term productivity growth, and pointed to three underlying factors — R and D, openness to trade and use of information and communications technology (ICT) — as having a specific influence on the 1990s surge. Moreover, the review suggested that these factors are not unrelated and appeared to be linked to a number of government-induced reforms in the policy and institutional environment.

Superficially at least, there do not appear to have been any obvious, major reversals in these factors that would help explain a productivity slowdown. ABS estimates do not show any substantial slowing in the rate of accumulation of skills. R and D activity has continued to increase in the late 1990s and the 2000s. The economy has continued to be more open to trade and the transfer of knowledge. There has been continuing growth in the use of ICT, with no obvious evidence that opportunities for ongoing ICT-based innovation in production, distribution and sales have dried up.

A slowdown in productivity growth could also be expected if Australia's opportunities for international 'catch-up' are approaching exhaustion. According to catch-up theory, a country at a lower level of productivity can realise relatively rapid productivity growth by absorbing the technologies and knowledge that have been developed by countries at the productivity forefront. However, whilst Australia improved its position in the 1990s relative to the commonly-used benchmark of the US, a remaining gap of the order of 15-20 per cent suggests that scope for further catch-up remains. Australia performs well in international terms in some industries such as agriculture and mining, but has substantial gaps in other industries (Parham, 2002; van Ark and Timmer, 2002; Rahman, 2005).

Very Recent Evidence

As noted at the outset, quarterly productivity estimates released for 2004-05 have indicated a decline in productivity. (Estimates for the June 2004-05 quarter have not been released at the time of writing.) The probability of future revisions makes it unwise to focus on specific magnitudes; and, again, a move over such a short period does not constitute a change in trend.

The estimates show a downturn in labour productivity that is associated with weak output growth and strong growth in labour input. In fact, the indications are that growth in hours worked has been well above the historical average.

The decline in productivity may, to some extent, be a cycle pattern. It is not that unusual for input growth to be strong relative to output growth in the first annual observation after a cycle peak. This reflects lags in the adjustment of input use to weaker output growth (or that decision makers perceive the downturn in output growth to be short-term).

The decline could partly reflect weaker capital deepening. The quarterly national accounts cover labour productivity only and estimates of the contributions from capital deepening and MFP will have to await the release of the annual estimates. To the extent that growth in labour input has increased relative to growth in capital — and this seems quite possible — the decline in labour productivity would reflect welfare-enhancing employment growth rather than lower MFP.

It is likely, though, that MFP will be affected by a number of industry-specific factors. The recent quarterly estimates show heavy output falls in Agriculture, which has been hit again by drought. Manufacturing (especially in Textiles clothing and footwear) also had output declines, which could be related to increased international competition, reinforced by pressures from a stronger currency (lifted by higher commodity prices). This could be more than just a fluctuation. Activity appears to have also dropped off somewhat in Construction.

Mining calls for more comment. This industry has demanded more labour in recent years and has featured in recent claims of skill shortages and infrastructure bottlenecks. It appears that the industry is still in transition to a position where it takes advantage of commodity price rises, not only in income terms, but also in quantum (and therefore productivity) terms. The quarterly national accounts show very strong output growth in Services to mining, probably associated with exploration and development, but more modest growth in mining production.

Conclusion

This assessment suggests that it is premature to declare Australia's experience of stronger productivity growth to be over. There are grounds to conclude that productivity growth has slipped off its record highs of the 1990s. But there are also grounds to conclude that productivity growth over the 1998-99 to 2003-04 period would still have been above the long-term historical average, had it not been for some atypical, short-term shocks. The very weak results in 1999-2000 and 2000-01 did not have a compensating 'spike' that usually follows a MFP downturn. Estimates for more recent years show tentative signs of a return to stronger productivity growth (and would have been firmer had it not been for drought). Furthermore, there is no obvious evidence of a reversal in factors that were considered to underlie the productivity surge in the 1990s; or of an exhaustion of catch-up and ICT-based innovation opportunities.

On the other hand, very recent quarterly estimates do show a decline in labour productivity growth. But they do not establish a trend, do not necessarily reflect (in entirety) a fall in MFP, may be in part a cyclical phenomenon and may also stem in part from another short-term shock in agriculture. MFP in

manufacturing is also down but, depending on how quickly and vigorously the industry responds, this may endure beyond the short term.

Productivity growth has also been held back in recent times in Mining and EGW. Mining is yet to see its investment of further inputs pay off fully in volume terms. Not enough is currently known about the EGW transition, but the nature of the industry suggests that this may turn out to be more of a 'one-off' transition than a long-term or repeated experience.

If it is not clear that the period of stronger productivity growth is over, it is also not clear that policy reforms and other factors that have helped to sharpen the incentives and enhance the capacities for improved productivity growth have run their full course. Even so, it would still be worth introducing any further policy measures that have net benefits and that help to lift productivity performance over the long term.

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