# The Productivity Puzzle

National Australia Bank

- **Labour productivity growth has slowed markedly in recent years, prompting calls for further economic reform.**
- **There is evidence that the mining and utilities industries may have been responsible for around half of this slowdown. This may reflect delays in large new investments coming on stream and the strength of commodity prices in mining.**
- **Weaknesses in GDP growth (including during the GFC) may also have played a role, encouraging firms to hoard idle time in their production processes.**
- **Declining real unit labour costs may also be encouraging more labour-intensive production.**
- **If structural productivity growth has not slowed, measured labour productivity growth is likely to recover in coming years.**
- **Ongoing reform of the Australian economy in such areas as competition, health and education is no doubt beneficial but need not be justified by cyclical fluctuations in productivity.**

## The recent productivity experience

The slowdown in measured productivity growth and, on some measures, its decline has been the subject of considerable recent controversy. Slower productivity growth has breathed renewed life into the national economic reform agenda of the last decade, which focused on education, health and remaining competition policy issues. Does the current productivity slowdown justify these concerns?

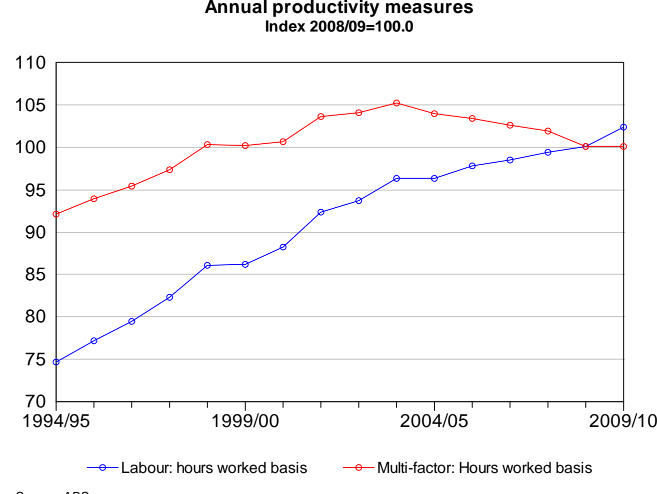
Productivity is a measure of output per unit of input. It tends to rise because we live in an industrial society that provides strong incentives to develop and adopt improved technologies. But the inexorable growth in productivity is not constant and may even occasionally reverse itself because of other, non-technological factors.

While there are various measures of productivity, we focus on labour productivity (output per unit of hours worked). While 'multifactor' productivity, based on combined inputs of labour and capital, has also suffered (and by more than labour productivity), this is understandable given that such measures continue to count the services of empty buildings and idle equipment as part of input.

We should also be concerned with the 'market sector' of the economy, in which commercial business operations take centre stage, and from which government is largely excluded. In Australia, the ABS excludes public administration & safety, education & training and health care & social assistance from the market sector (in some of these industries there may also be issues about the measurement of output).

Annual national accounts data reveal that, since the middle of the last decade, labour productivity growth has slowed and multifactor productivity has actually declined. More recent quarterly data reveal that labour productivity growth has been non-existent. In broad terms, annual labour productivity growth (on an hours worked basis) in Australia has declined from 2.8% between the mid-1990s and the mid-2000s to just 0.9% since then, a decline of 1.9% points.

**Annual productivity growth stalling or even falling**




**Quarterly labour productivity growth still slow**

Quarterly labour productivity: hours basis
Index 2008/09 = 100.0 seasonally adjusted

Source: ABS

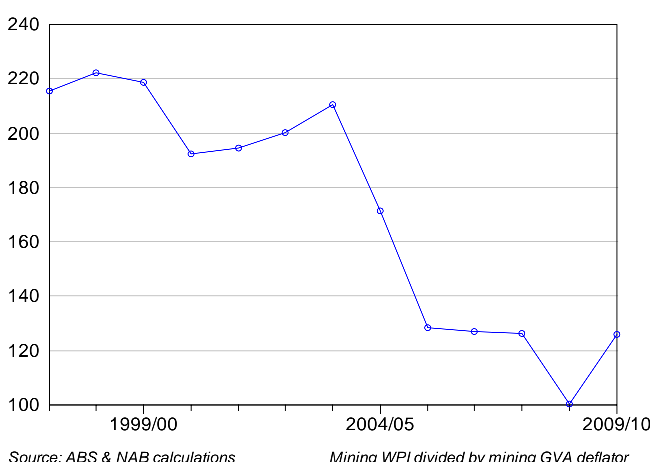
## Industry sources of productivity

Is it possible to identify a productivity slowdown in specific industries? There have been wide variations in labour productivity performance across Australian industries since the mid-2000s, with rapidly declining productivity in mining and utilities. The decline in mining productivity alone contributed 0.9% points to the aggregate industry slowdown, and the utilities sector was responsible for almost 0.2% points (these estimates abstract from

the effects of labour shifting between industries with different levels of productivity).

Without further detailed industry analysis, we can only conjecture about these more poorly performing industries. In the case of mining, at least three possibilities have been canvassed. First, labour has become relatively cheap in the mining industry in terms of the prices of the commodities produced by the sector, even after allowing for anecdotes of substantial pay packets for miners in remote locations. This makes it more attractive to use labour rather than capital equipment whenever possible. Of course, this would not account for reductions in multifactor productivity.

Scope for substituting labour for capital in the mining industry

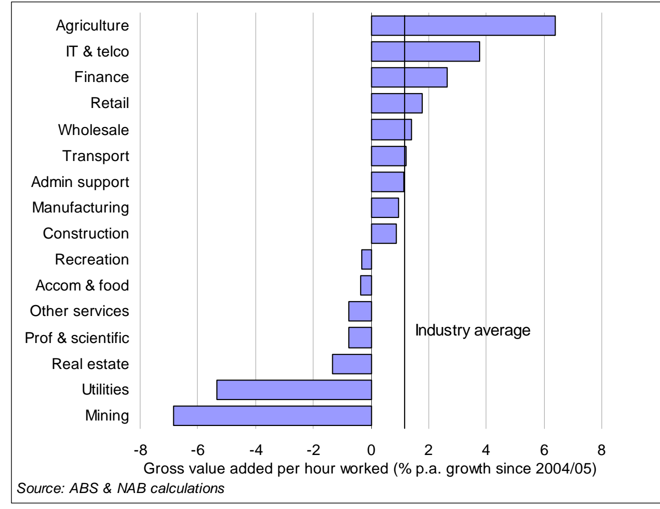



Second, high commodity prices may make it profitable to exploit lower quality mineral deposits with greater effort required per tonne of ore extracted. Third, the surge in investment in mines and infrastructure since the mid-2000s has employed large numbers of people but, because of long lead times, the concomitant rise in output is yet to be seen.

In the case of utilities, there have been similar heavy investments in recent years in electricity and water supply (particularly pipelines and desalination plants) that may be yet to yield their full benefits. The drought has also meant that the output of water supply and hydroelectric power has been under pressure without a corresponding decline in the requirement for maintenance and administrative staff.

These disappointing labour productivity results may improve in future years as new capital begins to be fully employed in mining and utilities. At the other end of the scale, labour productivity in agriculture appears to have risen sharply, but there are reasons to doubt the usefulness of this estimate. First, the labour productivity data for agriculture are much more volatile than for any other industry, partly reflecting the sensitivity of the output measure (gross value added) to changes in its commodity composition. Second, research by ABARES suggests that multifactor productivity growth in Australian agriculture has been struggling partly because there has been a decline in agricultural research effort. Because of its small size, even this strong measured productivity growth in agriculture only contributed 0.2% points to the market sector result.

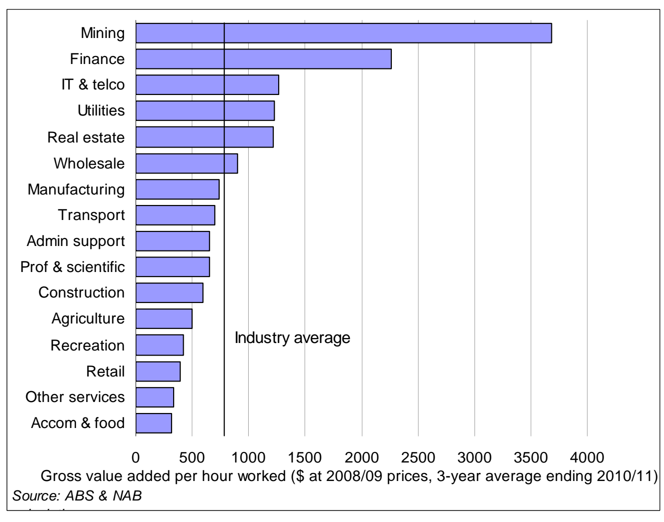
Productivity growth weakest in mining & utilities




## The role of industry composition

Aggregate market sector productivity also depends on shifts in the industrial structure of the economy. There is evidence that labour productivity has been boosted by the expansion of the mining sector at the expense of the rest of the economy, even though the mining sector productivity actually declined. Mining has the highest level of productivity by far. Since 2004/05, the share of mining in market sector hours worked has risen from 1.8% to 3.1%, while the share of manufacturing has declined from 15.1% to 12.6%. Taken in aggregate, compositional shifts were responsible for all (0.9% points) of the recorded annual labour productivity growth rate since 2004/05.

High productivity in mining




## Structural and cyclical productivity

Labour productivity growth is not independent of the state of the economic cycle. In economic folklore, the received wisdom is that productivity is ‘pro-cyclical,’ meaning that productivity strengthens during a boom and weakens during a recession. For most industries rising sales will not immediately result in additional hiring. Hiring and firing is costly and employers need to be confident that any change in activity will be sustained. Until then, hours will be extended and greater efficiencies will be exacted from each hour worked through reductions in idle time and the reallocation of workers. It is this latter aspect that contributes to higher observed productivity during an upswing. The same

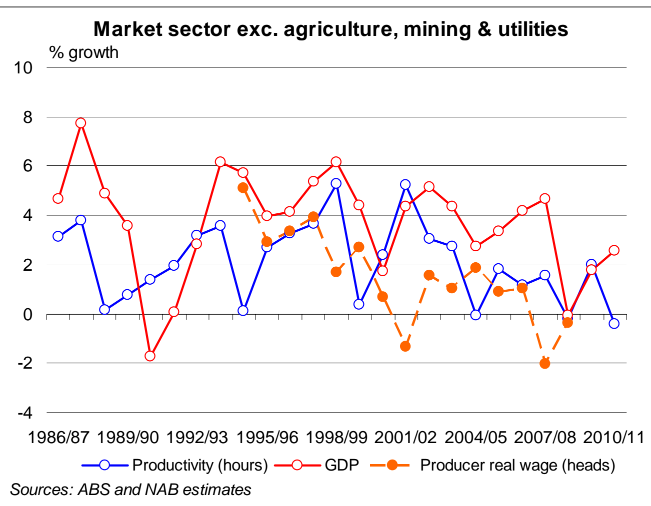
considerations apply in reverse. As sales decline, businesses initially reduce hours worked where they can and may also be willing to accept greater idle time.

For the market sector, excluding the possibly 'special' cases of agriculture, mining and utilities, annual labour productivity growth has shown a loose correlation with GDP growth. The slowdown in 2004/05 and the GFC in 2007/08 both seem to have been associated with an inordinate slowing in labour productivity growth. But this is clearly not the entire story.

Additionally, labour productivity is affected by the real wage faced by producers. Lower real wages encourage more intensive use of labour and a tendency for measured labour productivity to grow more slowly. We saw above that the producer real wage has actually declined sharply in recent years in the mining industry despite substantial increases in nominal wages because commodity prices received by mining firms have risen even faster.

For the market sector outside the farm, mining and utilities sectors, producer real wages have displayed little growth since the early part of the last decade, in contrast to the latter part of the 1990s. If technical progress has proceeded as normal (that is, 'structural' productivity has not slowed), this would be consistent with substantial falls in real unit labour costs for many industries and may have also contributed to the observed productivity slowdown.

Cyclical influences on labour productivity




*Sources: ABS and NAB estimates*

The slowing in real wage growth may reflect some spillover of the impacts of the booming mining sector on the rest of the economy. Underlying annual CPI inflation approached 5% towards the end of the first mining boom, well above the RBA target range, but it seems that this was not fully reflected in nominal wage growth.

## Outlook

A plausible case can be mounted that much of the decline in labour productivity performance in Australia since the middle of the last decade is attributable to special and cyclical factors. These include high levels of investment in the mining and utilities industries that have not yet come on stream, the impact of slower GDP growth during the GFC and an apparent stalling in the growth of real wages faced by producers, even outside the booming mining sector.

Ultimately, it is structural productivity growth (or, as it is described in the arcane world of economists, technical progress) that is relevant to economic welfare. The current slowing in measured productivity may begin to unwind as new mining and infrastructure capital comes on stream and as GDP growth picks up in response to the second mining boom.

The economic reforms of the 1990s were unlikely to have increased the rate of structural productivity growth (or technical progress). It is often claimed that increased competition is associated with increased productivity, but there is no compelling economic reason to accept this: larger firms with market power can also achieve economies of scale unavailable to smaller firms. It is unclear that competition reforms improved economic outcomes in Australia through higher productivity, but they have probably reduced the extent of 'excess' profits from monopoly and oligopoly in the economy. In that event, consumers would have gained from reduced prices and greater choice than in the absence of the reforms.

The more recent economic reform agenda is concerned with improving and expanding the reach of education and training as well as improving the efficiency of the delivery of government services, especially health. These reforms can be expected to lift the level of structural productivity (although not necessarily its growth rate) but over a lengthy time horizon. Realistically, educational improvements would need to have been implemented for an entire generation before their effects become measurable. Commendable as such policies may be, they should not be justified on the basis of relatively short-term, cyclical fluctuations in measured productivity.

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