



UNIVERSITY OF
TECHNOLOGY SYDNEY

Understanding Productivity Australia's Choice

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Foreword

PRODUCTIVITY GROWTH MATTERS

Many discussions of productivity inevitably reference Nobel Prize-winning economist Paul Krugman, and with good reason.

Krugman in many ways distilled the productivity challenge to its essence when he said “Productivity isn’t everything, but in the long run it is almost everything. A country’s ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.”

Australia’s productivity performance over the last decade has slipped. Our commodity boom and terms of trade boost have masked that performance.

Given the likelihood that Australia’s terms of trade will decline as the commodity price cycle runs its

course, the need to improve Australia’s medium and long-term productivity performance becomes even more pressing if we are to continue to raise living standards in our nation.

Informed debate about what has caused Australia’s productivity growth to decline in recent years and recommendations on how we can boost our productivity in the future is undoubtedly in the national interest.

It is for this reason that the McKell Institute is proud to present this report as a contribution to that debate.

In this report Professor Roy Green, Dr Phillip Toner and Dr Renu Agarwal provide expert analysis of the causes of Australia’s productivity decline.

“Most of what is required to lift Australia’s productivity is in the hands of individuals, especially managers of businesses. It will emerge through innovation in business processes within firms and more sophisticated relationships among firms, encouraging knowledge transfer and exploiting gains from specialisation”

Australia in the Asian Century, 2012

“To truly unlock the productivity of our nation we need workplace leadership and the requisite cultures and skills ... to encourage innovation, employee engagement and cooperation in our workplaces.”

Julia Gillard, Workplace of the Future event, 2009

They make the case that much of Australia's recent decline in productivity is as a result of industry specific and in some cases temporary factors.

Further, they find that many recommendations suggested to improve productivity, such as the further deregulation of labour and capital markets, are recommended in the absence of evidence that they will actually increase output. Instead, they seem to be solutions in search of a problem.

The low road of cost-cutting, lay-offs and cuts to working conditions will not deliver sustained productivity growth. Rising unemployment through mass lay-offs and the creation of a working poor in Australia through the erosion of workplace protections are very real risks if we take the productivity low road.

This report recommends that Australia takes the productivity high road.

It calls for government, industry and trade unions to look to innovate, improve management capability and focus on workforce development and upskilling in order to deliver long-term productivity growth.

Long-term dynamic efficiency gains can be delivered through innovation and skills in a knowledge-based, high wage and highly productive economy.

In short, the authors show us that Australia can improve productivity while growing businesses and wages.

But we must commit consistently and comprehensively to this high road
– this is Australia's choice.



The Hon John Watkins
CHAIR,
MCKELL INSTITUTE



Peter Bentley
EXECUTIVE DIRECTOR,
MCKELL INSTITUTE

Executive Summary

Australia's productivity slowdown

There is increasing recognition and agreement among policy-makers in Australia that productivity is a key driver of growth, competitiveness and living standards. But there is less agreement on the sources and measurement of productivity performance, and consequently on the policies that may contribute to a sustainable improvement in performance.

The need for such improvement has been sharpened and made more urgent by two separate but related problems that have recently received considerable public attention. The first problem is the impending fall in Australia's terms of trade from the heights reached during the commodity boom.

The unprecedented rise in our terms of trade as a result of increased commodity prices delivered a massive boost to the growth in our national income in the early 2000s, helped to shield Australia from the worst of the global financial crisis and made our economy the envy of the world. However, it masked a second problem which is the underlying deterioration of Australia's productivity performance since the 1990s.

While this problem could be safely ignored, and was ignored in the past, with rising terms of trade taking up the slack, it is now fully exposed by the turnaround in our terms of trade as the commodity cycle runs its course. There were warning signs but a cyclical event was confused by many policy-makers and commentators with structural change.

This report explores Australia's productivity slowdown and the policy measures that are being proposed to address it. The report finds that just as the slowdown was previously ignored, it is now misinterpreted and exaggerated to justify measures that may have little or no relevance to our future productivity performance, and which may themselves have contributed to the slowdown.

What caused the slowdown?

The most common measure of productivity performance is labour productivity, which measures output per unit of labour input. The slowdown in Australia's labour productivity growth in the early 2000s has less to do with the waning of the 1990s microeconomic reform agenda than the subsequent *increase in total employment* and, additionally, at least since the global financial crisis, the decline in output growth.

Commentators have argued that structural change should be facilitated throughout the economy in order to reinvigorate productivity growth. Some forms of structural change may well do so, particularly those which embody technological change and innovation, but the change associated with the deregulation of product and labour markets has simply shifted much of the jobs growth to low productivity sectors. This means that structural change has detracted from rather than enhanced labour productivity growth.

Industry-specific factors

This report also examines the decline in 'Multi-Factor Productivity' (MFP), which is a more comprehensive measure of productivity performance encompassing not only labour inputs but also capital and other sources of productivity. The report finds that this decline, far from being generalised, is the result of *large falls in productivity in a small number of specific industries, notably mining, utilities and agriculture*.

Mining & Agriculture: the decline in MFP in these industries reflects well understood and quantified impacts of factors such as drought

and large increases in capital expenditure without a corresponding increase in output. Most of the factors are temporary, as may be seen in the case of mining where huge levels of capital expenditure will eventually be offset by rising output as productive capacity is brought on stream.

In addition, higher commodity prices have encouraged the exploitation of high cost mineral deposits. In effect, these deposits require more inputs of capital and labour to achieve the same level of output as more easily accessible and higher grade deposits extracted previously. This is simply a playing out of the long recognised phenomenon that the mining sector is subject to diminishing returns to scale.

Utilities: in the case of utilities such as electricity, gas and water, the recent large and sustained increase in capital investment was required to compensate for inadequate investment and employment losses in the context of privatisation and corporatisation in the 1980s and 90s. The apparent ‘productivity miracle’ in utilities during this earlier period was mainly due to short-term profit maximisation through unsustainable cost-cutting.

The surge in utilities investment in the 2000s was also promoted by policy measures to improve security of supply (eg. desalination plants) or quality of supply (eg. increased telecommunications coverage). There is now clear evidence of ‘gold plating’ of utilities capital expenditure. Ironically, such gold plating can be viewed as the outcome of the same neoclassical economic thinking and policies that provided a rationale for the initial privatisation and corporatisation of these assets.

These policies also provided for a pricing regulator to ensure monopoly infrastructure and utilities suppliers did not abuse their market power.

However, it has long been recognised that it is difficult, if not impossible, to establish a pricing system that can achieve such multiple and sometimes conflicting economic, equity and environmental objectives. The pricing regulation of Australian utilities is a case study of these difficulties.

Capacity utilisation rates

Finally, the report finds that other factors can account for much of the remainder of the MFP decline, especially large swings in *capacity utilisation rates* over the last decade. Record high capacity utilisation rates over the 2000s were achieved up to 2007 but these dropped rapidly to much lower levels in response to the global financial crisis. Both excessive capacity utilisation and low capacity utilisation give rise to productivity declines.

In theory, the methodology used to calculate MFP is meant to capture and control for these effects, and in doing so largely discount their negative impact on productivity. However, due to a range of data and conceptual problems, these effects are not adequately captured, resulting in the large ‘apparent’ decline in MFP over the last decade which is now the cause for so much concern.

Given that this decline in MFP can be adequately accounted for as the outcome of a number of either temporary or policy-induced effects, the report finds no evidence to support the claim that the decline was due to factors such as changes to the industrial relations regime or excessive business regulation. Indeed, the period of most significant productivity decline coincided with the most radical deregulation of the labour market through the Work Choices legislation.

High road or low road to productivity growth

In sum, the report acknowledges and indeed emphasises that improved productivity is central to rising living standards and sustainable economic growth. Moreover, given the prospect of declining terms of trade as the commodity price cycle runs its course – and the pressure on Australia to reposition and compete globally as a ‘high cost’ economy – living standards will be even more dependent in the future on increasing our rate of productivity growth, particularly in trade-exposed sectors.

Australia is once again faced with a fundamental *policy choice* – the ‘low road’ of narrow cost-cutting and an unwinnable race to the bottom, or the ‘high road’ of longer term dynamic efficiency gains in a knowledge-based high wage, high productivity economy. While there is clearly a range of factors influencing productivity performance, the report proposes a ‘high road’ productivity strategy with a focus on three empirically grounded and integrated policy measures.

These policy measures are *first* support for enhanced innovation capability and performance of firms, including new business models, systems integration and ‘absorption’ of technological change; *second*, adoption of transformative management practices, drawing on improvements in management education and engaging with the full spectrum of talent and creativity in our workplaces; and *third*, expansion of participatory work organisation methods and improvements to skills formation and skills utilisation so that firms and organisations can achieve their potential.

Recommendation 1

INNOVATE OR PERISH

Innovative Australian businesses are twice as likely to report increased productivity compared with businesses that don’t innovate. Yet Australian innovation performance lags international competitors.

A key to successful innovation is collaboration among businesses and with research and education institutions, with the introduction of new programs such as the ‘Industrial Transformation Research Hubs’. Such collaboration can assist knowledge-sharing and overcome coordination failures which impede the development of innovation capability.

Government has an important role in providing a policy framework for innovation. Small and medium firms will particularly benefit from technology demonstration and diffusion projects, design capability-building, access to high quality business improvement services such as Enterprise Connect, incentives to undertake capital investment, support for research and development and workforce training initiatives.

The policy environment should encourage new business models and new firm entry without the ‘excessive competition’ that can lead to fragmentation of industry sectors and supply chains. Global competitive advantage will be enhanced by innovation clusters and precincts, with support from industry associations and trade unions in promoting enterprise-level innovation capability and performance.

Recommendation 2

CREATE BETTER MANAGERS

Superior management performance is positively linked to expanded sales, market valuation, employment growth and productivity. Consequently, it is increasingly recognised that the development of leadership and management skills is crucial to the improvement of Australia's productivity performance.

Studies have shown that Australia ranks well behind other advanced economies in management skills and capability, particularly when it comes to engaging workforces in strategic repositioning, branding and design integration, organisational change and, above all, 'instilling a talent mindset'.

While Australia has many world class managers, there is a 'long tail' of poor management performance, which is closely linked with low educational attainment. Significantly, managers in the manufacturing sector have one of the lowest proportions of tertiary qualifications across surveyed countries, hampering our ability to participate effectively as a 'high cost' economy in global markets and supply chains.

Australian governments and businesses must prioritise building innovation and management capability. This should include a focus on management education and leadership development, continuous workplace training and skills formation and initiatives to engage the talent and creativity of Australia's workforce.

Recommendation 3

MAKE BETTER USE OF SKILLS

Workplace skills are a key driver of productivity improvement. These skills are acquired in a variety of ways, including through formal education, training, work experience and other forms of informal learning.

There is evidence that workforce skills in Australian workplaces are not fully utilised, with research showing that up to half of employers regard their employees as over-qualified or over-skilled. This under-utilisation of skills and knowledge represents a major drain on productivity, and indicates the potential for Australian businesses to increase their performance not only through the provision of new workforce skills but through better utilisation of existing skills.

International research and experience has demonstrated that the most effective way to address this problem is through the promotion of innovative and participatory work organisation. This means active involvement of the workforce to improve workplace performance, job satisfaction and productivity, drawing on world best practice.

We welcome the Australian Government's recently announced 'Centre for Workplace Leadership' which has the potential to take us beyond the industrial relations stalemate. It will be able to play a key role in facilitating and encouraging the necessary transformation of Australian work and management practices and in the organisational culture of our workplaces.

1. Introduction

1.1 The purpose of the report

This report is a contribution to the debate about the medium to longer term productivity performance of the Australian economy over the last decade, as well as future trends and policies to improve this performance, which is fundamental to sustainable growth and prosperity. The origins of the debate lie in an apparent 'productivity crisis', or at least a measured deterioration in productivity performance over the last decade. This, in turn, prompted a response from the central economic agencies, such as the Treasury, the Reserve Bank and the Productivity Commission, to both explain this decline and identify measures to boost performance. These measures generally entail the more rigorous implementation of conventional neoclassical economic policies, such as accelerated privatisation and deregulated labour and capital markets and measures to stimulate further structural change or shifts in the industrial composition of Australian industry.

This report finds that the decline in productivity was largely due to a number of industry-specific factors that are arguably of a temporary nature and that compounding these factors are well-established difficulties in the accurate measurement of productivity. Further, the report maintains that there are significant problems with the conventional policy recommendations to improve productivity as the recorded slowdown was in significant part an outcome of the very policies intended to boost productivity growth. The report examines these issues whilst also recognising the key role of productivity in increased economic growth, competitiveness and living standards over the longer term. Finally, it advocates a number of policy drivers which will not only lift productivity performance but are generally associated with an improvement in the quality of working life. These drivers include improved management practices, enhanced innovation at a firm level, skills development and participatory work arrangements.





2. Meaning and Measurement of Productivity

2.1 What is productivity?

Growth in the total output of a modern economy such as Australia can come from just two sources. The first is from an increase in the total volume of inputs, that is an increase in the quantity of capital and labour used. The second is from an increase in the efficiency with which capital and labour are used to produce goods and services. The latter is known as productivity and, by definition, involves producing the same or a greater quantity of goods and services with less use of labour, capital and raw materials. In other words, productivity may be defined as a measure of how effectively and efficiently resources are used in production to produce a given level of output. In a modern economy, growth in total output results from a combination of an increase in the quantity of inputs to production through population growth and investment in physical and human capital and increased efficiency in the use of inputs in production.

Productivity growth can also occur through an improvement in the quality of goods and services without a corresponding increase in the price of these goods and services.

2.2 Importance of productivity

The Australian Government's white paper on *Australia in the Asian Century* recognises that central to Australia's future prosperity is 'lifting our productivity and participation by investing in our most important resource, our people. Improving the capabilities of all Australians will raise our productivity ...' (Australian Government, 2012). Productivity is critical to living standards since it permits an increase in real income per worker without a corresponding increase in hours worked or foregone consumption through increased savings and investment. For example, in Australia the rate of long run real output growth over the period 1964-65 and 2003-04 averaged 3.3 percentage points per annum. Of this, increased capital input contributed 1.6 percentage points (nearly 50%) per annum and labour input contributed 0.5 percentage points. Productivity

growth contributed 1.3 percentage points or almost 40% of total output growth (ABS 2009: 2-3).

One of the benefits of productivity is to increase the efficiency with which natural resources are used, so that, over the long run, less demand may be placed on the environment to produce the goods and services that people require. A clear measure of this is that energy intensity per unit of GDP has declined significantly over time due, for example, to increased efficiency in transport systems and electricity generation. However, the paradox must also be acknowledged that increased efficiency and reduced real unit prices for many commodities, such as cars or air travel, can lead to an increase in total demand to the point where rising output more than offsets the reduction in natural resource input per unit of output. Continuous population growth, itself stimulated by increased productivity and improved material well-being, is another obvious offsetting factor increasing natural resource use.

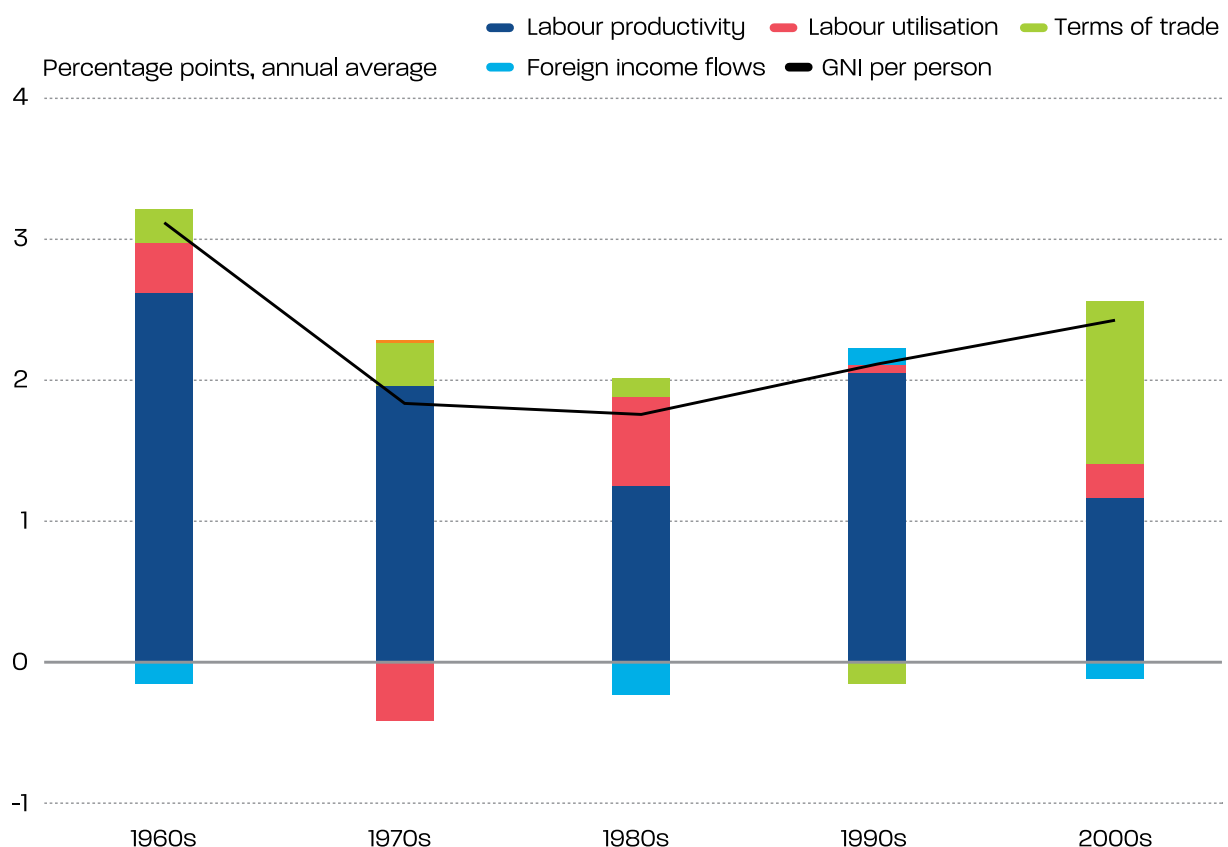
While productivity is the key input to rising living standards, how the benefits of increased wealth are allocated depends on the distribution of income within a nation. In the US, for example, over several decades the benefits of productivity growth have accrued to only a relatively small share of the population, with declining real wages for many, and a similar trend is evident in Australia, though not to the same extent¹. As commentators have noted, the relationship between the drive for productivity and competitiveness on the one hand and the widening class divide on the other, evidenced most starkly among developed economies such as the US and UK, is not a necessary one. Indeed, the Nordic countries have achieved high levels of economic performance with much lower levels of inequality (Florida, 2012; Scott-Kemmis & Green, 2012).

Numerous sources of productivity growth have been proposed in the literature, such as

economies of scale and increasing returns; enhanced domestic and international competition correcting slack effort; openness to foreign investment as a source of both capital and new technologies; technological change, improved public health and reduced mortality; improved levels of population education and improvements to work organisation. However, the importance of these sources as contributors to productivity growth, their origins, definition, measurement and their implications for government economic policy are the subject of fundamental disagreement among economists, as we shall see in this report.

Most recently, the significance of productivity as an issue for Australia has been reinforced by falling terms of trade and the prospect that these declines will continue for the foreseeable future. Over the 2000s, the terms of trade achieved 140 year record highs. Rising terms of trade was the

FIGURE 1:
AUSTRALIA'S PRECARIOUS FUTURE



Source: Contributions to Average Income Growth, Treasury

outcome of increased export prices for mineral commodities and falling prices for imported manufactures and services, the latter being due in part to the high \$A. (Imported services includes items such as overseas air travel.) This is evident in Figure 1 prepared by Treasury and Figure 2 from the Australian Bureau of Statistics which shows the marked divergence between the rate of growth of Gross Domestic Product per hour worked (which is a measure of net 'volume' of goods and services produced within the national economy, controlling for changes in 'value' due to rising commodity prices) and Gross Domestic Income which captures both volume and price effects. The key implication of this divergence is that, with the prospect of sustained reduction in the terms of trade, improving income growth per capita becomes more reliant on productivity growth.

2.3 Measuring productivity

Productivity is measured by expressing output as a ratio of inputs used. There are two types of productivity measures, namely Partial Factor Productivity and Multi-Factor Productivity. Partial Factor Productivity measures the contribution of just one factor of production, either capital or labour, to the production of total output. The most easily computed measure of productivity is 'labour productivity' which is simply total output divided by employment adjusted for hours worked. On the other hand, 'capital productivity' can be calculated by dividing capital stock, or funds invested in plant, buildings and land, into total output. Partial productivity measures do not permit a proper analysis of the causes of productivity change. For example, an improvement in labour productivity could disguise the fact that this was due to 'capital deepening' (increase in the capital-labour ratio), technological change or work intensification.



To address these limitations, economists have sought to isolate the contribution of each factor of production, capital and labour, to total production. Many studies have been undertaken which seek to estimate the respective contributions of capital and labour to production at an economy-wide, industry and even firm level. This approach is known as 'growth accounting' since it seeks to explain or account for changes in the level of total output in terms of changes in the quantity of each factor over time. One of the original and, arguably, most important studies was by Robert Solow (1957) who found that over the first half of the 20th century in the US, around 87% of the growth in total output could not be accounted for by the growth in factor inputs but was due to an 'unexplained residual'. This residual is now referred to as 'Multi-Factor Productivity' or MFP. Consequently, MFP growth may be attributed to a wide range of possible sources, such as technological change, increasing returns to scale at the firm level, industry or economy-wide increasing returns, variations in capacity utilisation and measurement errors.

2.4 Issues with productivity estimates

It is important to recognise that there are very considerable theoretical and methodological problems in constructing growth accounting-based productivity estimates, which require simplifying assumptions. Some of these assumptions include:

- **Competitive markets:** the assumption here is that the economy operates according to the principles of perfect competition, in particular that all factors of production are fully employed; the wage rate and the rate of profit reflect the relative contributions of labour and capital to total output, and there are no increasing returns to production. There is a great deal of literature on the relevance and validity of this assumption for economic analysis, which remains controversial (Green 1992).
- **Quantity and quality:** it is assumed that there are accurate methods to isolate the effect of changes in the quantity of labour and capital from changes in the quality of these factors over time. Changes in labour quality arise for instance from increases in educational attainment, or an average increase in job tenure which enhances skills or changes in the productivity of capital goods due to technical change incorporated into their design and performance. Changes in the quality of factors of production are converted to changes in the quantity of factors by 'deflating' or 'inflating' the price of these factors – referred to as 'quality adjusted changes in quantity'. In simple terms, an improvement in quality results in an increase in the quantity of the factor. For example, rapid improvements in the information processing capacity of computers results in a large increase in the capital intensity of industries that intensively use computers in production. Robertson (2009) notes that this can have a depressing effect on productivity growth as a greater quantity of inputs are used per unit of output. Given the incredibly diverse range of capital inputs into production, accounting for changes in the quality of heterogeneous capital goods can only be an approximation. Equally, there are major methodological issues in accounting for changes in labour quality.
- **Quality of outputs:** just as quality changes in inputs must be controlled for, so too must quality changes in output. For example, there have been big improvements in the quality of motor vehicles over the last few decades, such as safety and fuel economy, despite a fall in their real price. Robertson (2009) points out that this can increase productivity growth as an improvement in the measured quality of output typically increases the quantity of output. Similar problems apply to measuring quality changes in intermediate inputs to production.
- **Capacity utilisation:** this assumption is an attempt to control for the effects of changes in capacity utilisation over business cycles by estimating productivity using 'peak to

peak' cycles of economic activity. Typically productivity growth rises as economies come out of recession and capacity utilisation increases, and it declines when very high rates of capacity utilisation are achieved in boom times. However, attempting to control for capacity utilisation can only be an approximation since capacity utilisation rates differ over different growth cycles.

- **Stocks and flows:** this assumption is about the appropriateness and feasibility of converting a 'flow' of investments in capital and labour over time into a 'stock' of capital and labour at a single point in time. Computing the stock of capital depends critically on the assumed rate of capital depreciation over time. The stock of both capital and labour are assumed to contribute to total output according to their respective rates of return. These returns are based on the share of national income going to labour and capital respectively².
- **Intangible investments:** finally, it is assumed that there is a reliable method for measuring and accounting for the contribution of intangible investments, such as brands and Research and Development (R&D) as inputs to production.

However, this presents major problems. For example, whereas the return to capital and labour is assumed to be equivalent to their share of national income, what is the assumed 'productivity' of intangibles? There are also problems in estimating what depreciation rate should apply to often massive investments in brands or to the generation of new knowledge in the case of R&D³.

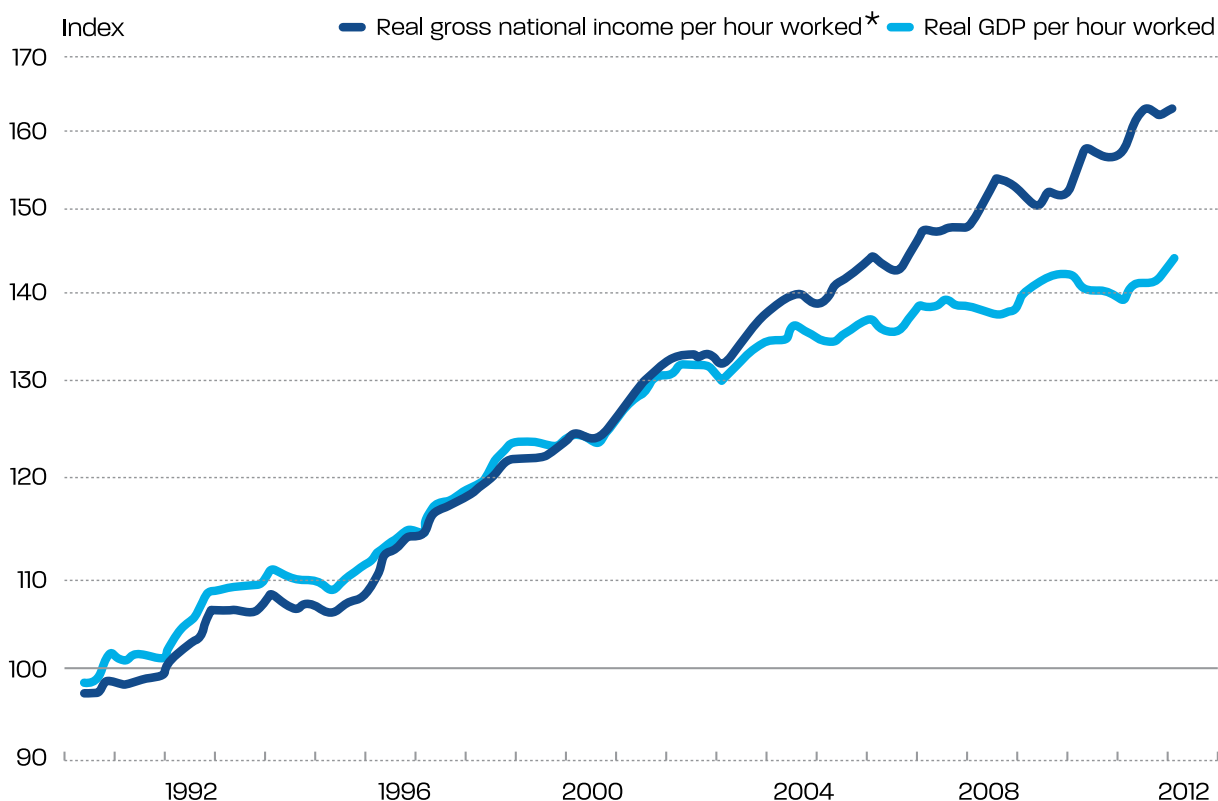
These assumptions are widely recognised among economists as bold, even heroic. A small deviation from any of the assumptions over time can lead to large differences in estimates of the productivity of labour, capital or the 'residual'. While this account of productivity and MFP measurement may seem abstract, the following two examples demonstrate more concretely the difficulty of both productivity measurement and the interpretation of these estimates for public policy.

First, Zheng and Bloch (2010) suggest that the ABS method for measuring MFP in the mining industry is seriously flawed as it fails to account for the rising costs of extracting non-renewable resources, such as minerals, oil and gas. Mining activity is subject to diminishing returns to scale as the lowest cost mineral deposits have already





FIGURE 2:
AUSTRALIA'S PRODUCTIVITY AND INCOME
MARCH 1990 = 100, LOG SCALE



* Real GDP adjusted for the purchasing power of changes in the terms of trade and income accruing to foreigners. Source: ABS

been exploited, or are being currently exploited, and an expansion in output from lower quality deposits requires successively larger increases in inputs per additional unit of output. This is exacerbated by currently high prices of mineral commodities which encourage the exploitation of high marginal cost resource deposits. Including these factors in the equation, the researchers concluded that 'the average MFP growth in Australian mining... is nearly 2% over the sample period 1974-75 to 2006-07, rather than 0.01%' (Zheng and Bloch 2010: 26). In addition, the ABS (2010) argues that the entrance of less experienced workers into the mining industry may also lower MFP (ABS 2010). This result

demonstrates how extremely sensitive the results of MFP analysis are to the assumptions employed by researchers.

Similarly, the Productivity Commission in response to sustained and large declines in MFP in the electricity, gas and water industries, of around 3.2% p.a. over the last decade, undertook a detailed examination to understand the particular industry dynamics driving this result (Topp & Kulys 2012: xiv). The authors found that in the electricity supply industry there was an increase in the ratio of peak to average demand because of increased use of air conditioners. This resulted in lower average rates of capacity utilisation and accounted for half of the MFP decline in



the electricity industry. Other factors included 'cyclical investment in lumpy capital assets, which temporarily increased inputs ahead of growth in output; a shift to greater undergrounding of electricity cabling, which raised costs and the quality of output, but not the volume of measured output; and policy induced shifts away from coal-fired power to higher-cost, but less polluting, sources of new supply' (Productivity Commission, 2012: xiv). For the water supply industry, a full 80% of the MFP decline was attributed to two exogenous factors. First, restrictions on water demand in response to widespread drought conditions led to lower measured output. This also lowered capacity utilisation. Second, stricter sewage treatment standards and increased water security supply from large investments in desalination plants increased industry costs, but there was no adjustment to measured output to account for the quality improvement. The study concluded that the detailed examination of industry dynamics 'highlights some of the challenges involved in measuring and interpreting estimates of MFP growth in utilities' (Topp & Kulys 2012: xiv). A different, but complementary explanation for the surge in utilities investment is provided in the next section.

The results suggest that the decline in productivity is the result of either 'one-off' factors such as drought or policy induced changes that increased the cost of delivery. Importantly, these are industry specific factors that do not apply economy-wide. In the first case, the decline in MFP is temporary and/or cyclical, and in the second the imposition of higher costs adversely affecting productivity can be justified in achieving environmental, security of supply or other social objectives. Secondly, these results put into perspective arguments that give priority to more impressionistic explanatory factors such as waning microeconomic reform, labour market rigidities and various types of government regulation. Finally, the results again highlight the sensitivity of the MFP estimates to the assumptions. In particular, had the price deflators used to derive the volume of production for the utilities industry (price multiplied by physical output) been appropriately adjusted to account for an increase in the 'quality' of output, the apparent decline in MFP would have substantially evaporated.

2.5 Sources of productivity growth

Simply calculating productivity growth rates over time or the contribution of particular factors to these trends is not by itself a guide to policy in terms of lifting the rate of productivity. It is important to note that there is considerable dispute among economists about the sources of productivity growth and, consequently, considerable disagreement regarding productivity-enhancing policy measures.

Most economists tend to emphasise those explanatory factors that are consistent with the neoclassical economic theory that underpins construction of the MFP model. For example, they typically emphasise economy-wide factors such as free trade, structural change (or the reallocation of factors of production across different industries) and labour market and capital market deregulation as the chief sources of productivity growth. They give particular weight to the bracing effect of textbook models of 'competition' as a spur to enhanced firm performance. Paradoxically, despite identifying and quantifying the central role of technical change in productivity and economic growth, as captured by MFP, neoclassical economics treats technical change as an analytical 'black box', as it has very little to say about the actual processes of developing and diffusing new products and production methods (Rosenberg 1994).

Technical change is difficult if not impossible to fit into static equilibrium models (Kaldor 1966). This is because technical change is associated with features that give rise to a variety of 'market failures' such as 'sunk costs' (where resources are expended, for example on R&D with no necessary return), 'uncertainty' (the opposite of the assumption of perfect information required for perfect competition), unemployed resources (as existing production processes, products and services are rendered obsolescent by new methods and products), externalities (where a firm can benefit from the activity of other firms without paying for these benefits, leading to underinvestment in activities such as training and R&D), and temporary monopolies (arising from productive knowledge

which is retained within a given firm or region or exclusive rights granted by patents).

On the other hand, economists influenced by Joseph Schumpeter and evolutionary and institutional approaches emphasise the empirical and theoretical shortcomings of the perfect competition model and give much greater weight to innovation and technical change as a source of productivity growth. Rather than regarding the conditions which give rise to technical change as the outcome of 'market failures', they regard these conditions as essential and inevitable features of a market economy:

By itself, market failure is too narrow a perspective to provide an adequate analytical or empirical basis for innovation policy. The central ideas of the market failure doctrine are rounded in the theory of a perfect competition and the fundamental welfare theorems that link this idea to the optimum allocation of resources in an economy...The problem that now arises is that these 'failures' are an intrinsic consequence of the process of innovation itself and could only be eliminated if innovation ceased. Thus the model of perfect competition in a stationary state, a world in which innovation, or indeed any change of human knowing is absent, can serve only as a distorting mirror in which to reflect the innovation policy problem.

(Dodgson et al 2011: 1146)

These economists also emphasise the complex institutional arrangements which can either encourage or discourage investment in and diffusion of technical change. A central role is given to factors such as increasing returns, and they point to the central role of large firms in generating technical change and the much higher productivity of large firms compared to small firms. Schumpeterian economists also focus on the marked differences across industries in their scope for productivity growth and as sources of technical change. They tend to emphasise both industry-specific causes of productivity gains as well as economy-wide factors. The disputes between conventional and alternative strands of economics are reflected in current debates around the magnitude and causes of the apparent productivity slowdown that occurred over the last decade in Australia.

3. Australia's productivity performance

3.1 Key productivity trends

The Australian Bureau of Statistics (ABS) has employed the productivity growth accounting methods, briefly described above, to derive estimates of MFP on an economy-wide and industry basis. Despite having produced these statistics for several years, the ABS acknowledges both the deficiencies in available data and the extreme sensitivity of the results to the assumptions used in their construction by continuing to title these results 'experimental'.

Growth in total economic output is, by definition, the sum of inputs in the form of capital, labour and MFP. Over the long run, 1973-74 to 2007-08, annual real output growth has average 3.1%, comprised of 1.8% growth in capital services, 0.5%

increase in annual hours worked and 0.8% increase in MFP (Table 1).

There is also considerable variation across the sub-periods in the rate of output, reflecting movements in the business cycle, such as the recessions in the early 1980s and 1990s and slowdown in the late 2000s induced by the global financial crisis. Of particular note is the slowdown in MFP that occurred from 2003-04 onwards. Over this period there is considerable growth in capital and labour inputs but either no contribution or a negative contribution from MFP to output. In other words, there appears to be a sustained collapse in productivity in the Australian economy from around 2004 to the present (Figure 3 and 4).

Moreover, 'Australia has experienced a much more pronounced deterioration in Multi-Factor

TABLE 1:
**CONTRIBUTION TO ANNUAL GROWTH AUSTRALIA:
SELECTED INDUSTRIES (A)**

	1973-74/ 2007-08	1973-74/ 1981-82	1981-82/ 1984-85	1984-85/ 1988-89	1988-89/ 1993-94	1993-94/ 1998-99	1998-99/ 2003-04	2003-04/ 2007-08	2007-08/ 2010-11
OUTPUT GROWTH	3.1	2.2	1.7	4.3	1.9	5.0	3.5	4.1	2.5
CAPITAL SERVICES	1.8	1.7	1.3	1.9	1.2	1.8	1.8	2.7	2.5
HOURS WORKED	0.5	0.0	-0.3	1.7	-0.3	0.7	0.6	1.4	0.8
MFP	0.8	0.5	0.7	0.6	0.9	2.5	1.2	0.0	-0.9

Source: ABS (2011a) Experimental Estimates of Industry Multi-Factor Productivity, Australia: Detailed Productivity Estimates. Derived from Table 5 (first 8 columns) and Table 2. (The data in the last column are simple averages). (a) For selected industries: A Agriculture, Forestry and Fishing; B Mining; C Manufacturing; D Gas, Water and Waste Services; E Construction; F Wholesale Trade; G Retail Trade; H Accommodation and Food Services; I Transport, Postal and Warehousing; J Information, Media and Telecommunications; K Financial and Insurance Services and R Arts and Recreation Services

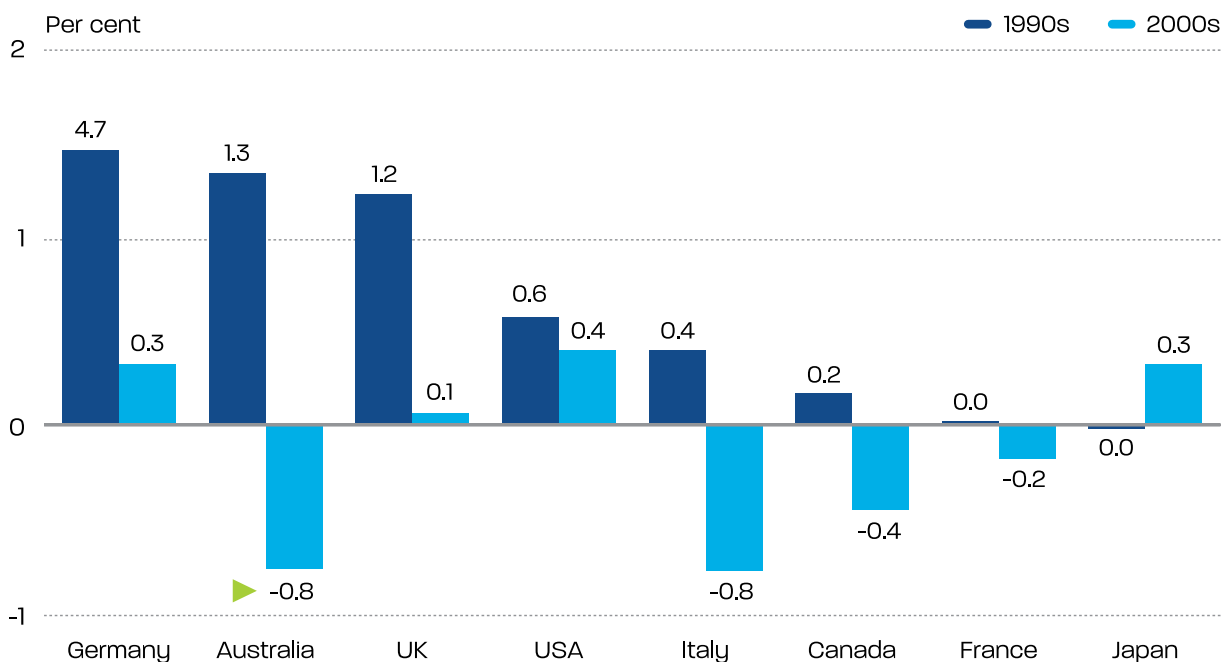


Productivity than the OECD as a whole' (Eslake & Walsh, 2011: 16). The OECD identified Australia along with Portugal, Mexico and Ireland, as having experienced a 'particularly strong deceleration in labour productivity growth' between 1995-2000 and 2001-06'⁴ (Figure 5). Nevertheless, it is important to emphasise with Treasury and the Productivity Commission that just three out of the 12 'market based' industries, that is, mining, utilities and agriculture, used to compile the MFP estimates, account for approximately 80% of decline in overall MFP.

3.2 Explanations of productivity decline

Considerable concern has been expressed in official circles over the productivity performance of the Australian economy over the last decade (Productivity Commission 2012; Reserve Bank of Australia 2012; Australian Treasury 2012). The apparent collapse in MFP has been attributed to a very broad range of factors. In a study for the Grattan Institute, Eslake and Walsh (2011) provide a useful summary of the variety of

FIGURE 3:
MULTI-FACTOR PRODUCTIVITY GROWTH



Source: The Conference Board Total Economy Database and Treasury

conventional explanations of these productivity trends. This section assesses these explanations. Many of the conventional 'causes' identified for the apparent productivity slowdown over the last decade demonstrate largely ad hoc and sometimes contradictory reasoning. Most are also proposed with little or no empirical support. A common theme in these accounts is that the explanation of, and solution to, the apparent productivity slowdown requires a neoliberal public policy agenda wedded to narrow cost efficiencies and deregulation rather than the promotion of dynamic productivity gains.⁵

a) Rate of inputs exceeds rate of output

Conventional explanations of productivity decline assign great weight to some industries experiencing an unusually large and sustained increase in the use of labour and capital over the last decade, though without a corresponding increase in output. This is said to apply especially to mining and the electricity, gas and water industries. The Productivity Commission identified declining MFP in these two sectors as a major contributor to overall decline in economy wide MFP, an observation taken up by Eslake and Walsh (2011). Indeed, the Productivity Commission (2010: 68) estimates that these two sectors plus agriculture, forestry and fishing

account for almost 80 per cent of the decline in MFP growth between the 1998/99 to 2003/04 and 2003/04 to 2007/08 growth cycles.

There is considerable empirical support for this argument, though, as noted in the earlier discussion of the mining and utilities industry, more recent analysis is not consistent with the claim that Australia as a whole has experienced a 'productivity slowdown'. As we shall see, this is because the slowdown was due to a range of factors that are increasingly understood to be industry-specific or temporary, or both.

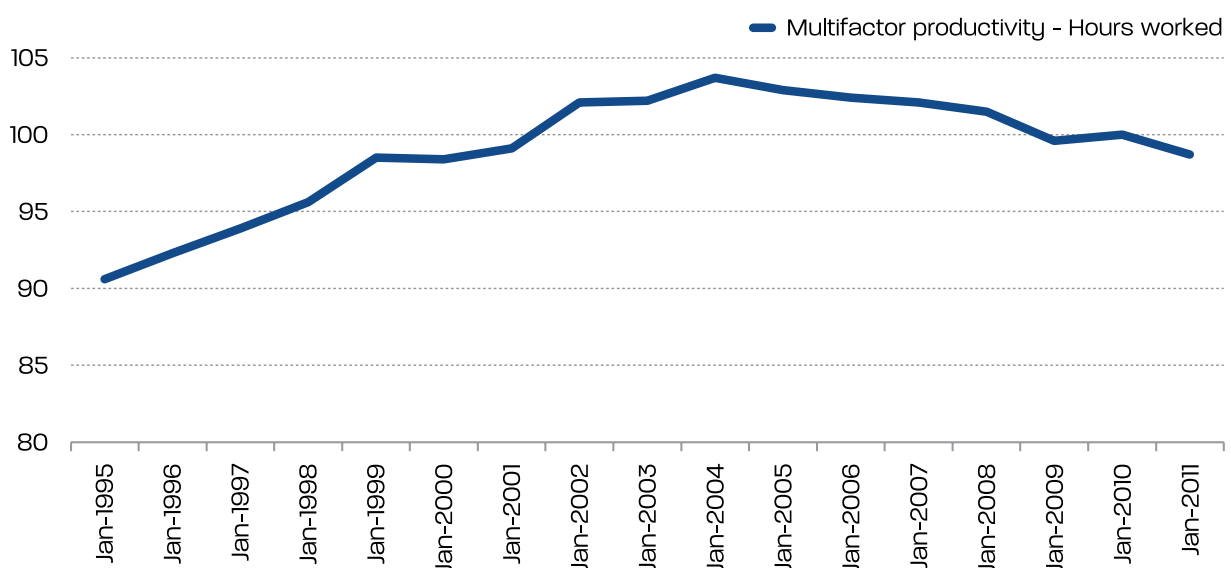
The earlier discussion also highlighted the considerable methodological problems in computing MFP which contributed to the perception of a significant productivity slowdown, for example, the inability to properly account for an improvement in the 'quality' of the output from the water industry arising from increased security of supply. These issues are amplified below and provide little support to the conventional explanation of the productivity slowdown or to the associated policy prescriptions.

b) Waning of microeconomic reform

Rather than leading to a permanent increase in the *rate* of productivity growth, the microeconomic reforms introduced from the late 1980s to the late 1990s are now argued to have produced a 'one-off' improvement in the *level* of productivity. These microeconomic reforms included the introduction of financial deregulation, privatisation or corporatisation of government utilities, enterprise-level wage bargaining, reduced tariffs and application of competition policy. It follows from this interpretation that the public must embrace another round of productivity-enhancing economic reforms, including such initiatives as further labour market deregulation, reduced business regulation, reduced barriers to foreign investment, improved infrastructure planning, 'benchmarking' the performance of public services and removing distortions in the tax system which favour one particular economic activity over another (Eslake & Walsh 2011: 13-14).

While there may be a case for further specific reforms, it has not been made consistently with the

FIGURE 4:
**MULTI-FACTOR PRODUCTIVITY BASED ON HOURS WORKED
(1995-2011)**





available evidence. In particular, the contention that the effect of microeconomic reforms should be waning over time is puzzling for a number of reasons. The proponents of this argument do not explain why the effects of significant changes, such as privatisation and corporatisation of state assets, price regulation of the resulting private monopoly providers, tariff reductions and contracting out the delivery of government services, should have been so short-lived.⁶

The productivity performance of the State government electricity assets privatised and corporatised over the late 1980s and 1990s provides an insight into why this 'MFP miracle' appears to be so transitory, although the example is one that should be of concern to advocates of such reforms. According to Treasury

(Dolman & Gruen 2012: 2), over the decade of the 1990s there was major productivity growth in electricity, gas and water supply rising from substantial reductions in their workforces following corporatisation and privatisation of their operations, and a reduction in their levels of investment. Productivity levels in these industries rose towards the international technological frontier'. In other words, by cutting capital investment and the workforce, a significant increase in measured productivity was achieved over the 1990 decade as rising output was met from a low growth in inputs. In contrast, labour productivity between 2000 and 2011 in the industry declined by 40% (ABS 2011: Table 15: Labour Productivity and Input, Hours worked and Gross Value Added (GVA) per hour worked by Industry).⁷ This productivity decline is due to rapid population growth, deterioration of capital stock and increase in the ratio of peak to base demand which led to a significant expansion of capital investment and employment in the electricity industry over the 2000s.

Garnaut (2011: 39-46) finds that another important factor in this rapid expansion in investment was a change in the pricing system imposed on the private and corporatised 'regulated monopoly', that is, the electricity supply industry. This pricing system is argued to encourage 'gold plating' of assets, or over-investment, by guaranteeing both a high rate of depreciation on assets and return on capital invested by the electricity suppliers.⁸ From 2000 to 2011 annual average real gross fixed capital formation for the electricity, gas and water sector was 2.6 times larger than of the previous decade (ABS 2011b: Table 51 Gross Fixed Capital Formation, by Type of Asset). Hours worked in the industry over the decade to 2011 nearly doubled, after falling substantially in the previous decade.⁹ With the benefit of hindsight it is clear that the 'MFP miracle' of the 1990s, at least in this industry, was a product of short term profit maximisation and the gains were chimerical, as they were reversed in the following decade.

Aside from the possibility of financial incentives stimulating excessive capital investment, the

Australian Energy Regulator (AER) (which among other activities sets wholesale prices for electricity within the National Electricity Market) is highly critical of the behaviour of participants in the electricity market, accusing them of abusing their inherent market power. For example, the regulator finds that generators withhold supply to drive up prices in periods of peak demand and use 'strategic pricing' to slash prices in other periods to exclude new competitors from entering the market (AER 2011). This behaviour is argued by the AER to have an adverse effect on productivity.

The difficulties of achieving an optimal pricing structure for a profit maximising regulated monopoly in the presence of information asymmetries between the regulator and the regulated and, given the necessity to ensure continuous supply of essential services, are well known (Averch & Johnson 1962). The Australian electricity industry serves as a case study of the extreme difficulty, if not practical impossibility, of developing pricing controls on a profit maximising regulated monopoly that can deliver efficiently and effectively multiple and sometimes conflicting objectives.

These objectives include providing an adequate incentive to capital investment to meet rising demand, especially 'peak' demand; investing in technological upgrading such as R&D and training; ensuring security of supply; ensuring a supply price to electricity users that does not discriminate against other energy sources, encourages the growth of investment in user industries and meets the equity objectives of government with respect to household needs for essential services, such as electricity and water; and, finally, meeting current and future environmental standards, especially the challenge of climate change.¹⁰ The imposition of regulated pricing regimes on privatised and corporatised government utilities was one of the central tenets of micro-economic reform (Hilmer 1990), though the difficulties of this form of administered pricing were either not apparent to proponents or not fully disclosed to policy makers or the public at the time.

c) ICT effects

A key argument of neoclassical economists is that microeconomic reform encouraged the uptake of Information and Communication Technologies (ICT) and this was a key factor in the 1990s productivity surge. The Productivity Commission finds that:

Uptake of ICTs can be seen as a proximate factor in aggregate productivity growth, but other underlying factors are necessary to drive the uptake of ICTs and ensure that they are used in ways that generate the most advantage... [M]icroeconomic reforms have played a key role in providing incentives, principally through competition, to be more productive. Responses have included the quick uptake of ICTs. Moreover, reforms have also provided greater flexibility for businesses to restructure in ways that enhance the productivity gains from using ICTs.

(Parham et al 2001: xxxvi)

Technological change has always been central to productivity growth and there is no question that ICT was critical to the productivity surge of the 1990s driven by productivity growth in the ICT-producing sectors and large rates of annual increase in investments in the ICT-using sectors (Jorgensen et al 2008). For example, technological advances in computing power and the internet greatly lowered cost of information acquisition and processing and enabled the restructuring of businesses processes (such as Just-in-Time production and distribution) and development of new products (use of Skype for communicating and buying behaviours using online shopping). ICT is identified as an important contributor to productivity growth in North America and Europe (Gordon 2010 & 2012, van Ark 2010), and ICT-enabled social technologies have demonstrated the potential for



a transformative impact on the speed, scale and economic value of communications: 'We estimate that between \$900 billion and \$1.3 trillion value can be unlocked through the use of social technologies in the [five sectors] we examined' (McKinsey Global Institute 2012:3).

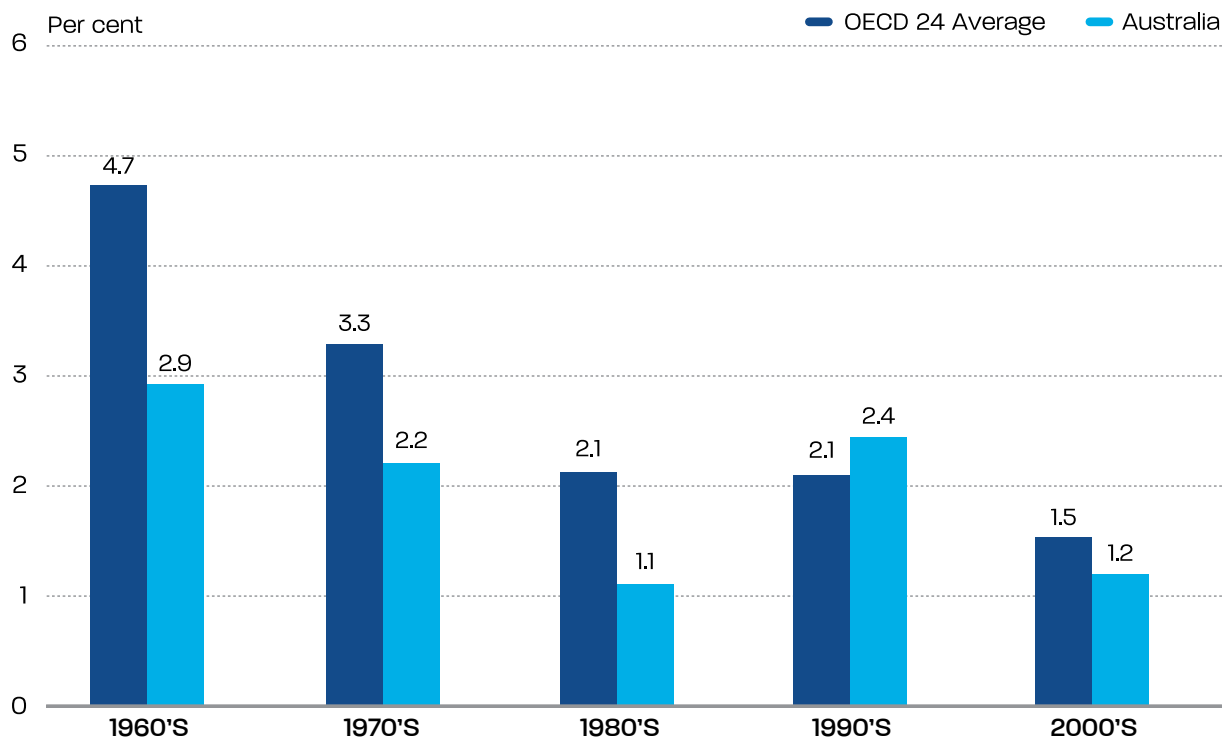
However, there are important reasons to question the idea that microeconomic reform was a major factor in stimulating either generalised productivity gains or specifically explaining the uptake of ICT by industry in Australia. First, as noted by the Productivity Commission, 'Productivity gains associated with ICT use have been concentrated – at this stage at least – in distribution (wholesale and retail trade) and financial intermediation' (Parham et al 2001: xii). The same pattern occurred in the US where the largest productivity gains were due to 'the rapid increase in use of IT in services industries,

especially in distribution and finance and business services' (Van Ark 2010: 20). A telling criticism is the disparate productivity performance of different industries, which argues 'against explanations for the surge which might have been expected to have general effects' (Hancock et al 2007: 20).

In other words, advocates of the role of microeconomic reform in generating the 1990s productivity surge do not explain why the effect should have been focused on some but not other industries. Related to this, the industries with the largest productivity gains attributed to ICT were arguably not subject to any significant increase in 'competitive' pressure as a result of microeconomic reform in the 1990s. If anything, these industries became more concentrated and less competitive as a result of changes in the 1990s. For example, banking, financial services and retail were not subject



FIGURE 5:
LABOUR PRODUCTIVITY GROWTH



Source: The Conference Board Total Economy Database and Treasury

to any significant import competition as a result of changes in the 1990s; they were never subject to tariffs and, moreover, in the case of banks, remain highly regulated and the beneficiaries of explicit government guarantees of support in the event of business failure. Australia has probably the most concentrated retail industry and banking system in the developed world.

Economic history teaches us that the productivity gains from ICT over the 1990s reflect the typical pattern of major technological change in that they do not occur in smooth linear and incremental way but are episodic or occur in cycles with many decades between the peak in each cycle. Indeed, so regular is this cyclical pattern of major technological development that the temporal progression of technical change is referred to as 'Kondratieff' waves, after the Russian economist who identified the cycles in 1925. Following the introduction of a new technology, productivity increases rapidly as it diffused through the

economy, but the rate of productivity growth from this innovation declines as its uptake is saturated and scope for fruitful adaptation and extension diminishes.

This pattern may also explain, in part, relative decline in productivity over 2000s. Gordon (2010: 15) suggests that one reason for the decline in the contribution of ICT to US productivity in the 2000s compared to the 1990s is that 'innovations in the later period were less fundamental' than in the previous period, and he cites the example of the development of the internet in the 1990s. This is highly speculative, but it remains the case that the reasons for the apparent decline in the contribution of ICT to productivity growth over the 2000s globally are the subject of great debate. The key point for this study is that, at an economy-wide level, whatever the productivity gains generated by ICT over the last decade, they were insufficient to fully offset the decline in measured MFP over the 2000s.

d) Labour market rigidities

There are also good grounds to question the assertion that labour market deregulation was behind the surge in productivity over the 1990s. The principal criticism by Hancock (2007) and others is the difficulty advocates of this argument have both theoretically and empirically establishing such a relationship. For every argument that can be advanced for the adverse effects of collective agreements and union 'interference' with management, opposite arguments can be produced pointing to the positive effects of labour standards and higher wages on the incentive to invest in training, to invest in innovation and to lower the transaction cost burden of employers negotiating individual contracts. Because the arguments are in conflict, 'we are left without unambiguous predictions as to the effects of industrial relations situations and arrangements. Moreover, the various cause-and-effect relationships that are suggested may operate simultaneously and, to an unknown degree, cancel each other. Hence it may prove to be as difficult to identify empirically the impacts of industrial relations as it is to specify them theoretically' (Hancock et al 2007: 10).¹¹

In addition, the data does not permit isolating the effects of other changes to the production system that occurred at the same time that microeconomic reform was implemented. Significantly, this was also a period of rapid technological change:

At first sight, an industrial relations explanation for the surge of the late 1990s has some appeal, in that it occurred at a time when any beneficial effects of enterprise bargaining might have been expected to become apparent. There are, however, problems with this perception of events, over and above the doubts that always attach to post hoc ergo propter hoc reasoning... there were other factors that might have contributed to the surge.

Even if we were to accept that the surge was due to 'microeconomic reform' – the Productivity Commission view – we would still face the task of separating the effects of industrial relations change from those of greater exposure to foreign trade and enhanced domestic competition. And there are factors outside microeconomic reform – notably the increasing use of computers and related technology – that may have had a strong effect on productivity.

(Hancock et al 2007: 33)

The overall thrust of orthodox argument is that productivity growth was the result of microeconomic reform, of which labour market deregulation over the 1990s was an important element. However, this argument does not fit comfortably with other evidence presented in the Eslake and Walsh (2011) study. In particular, they identify a 'cause' of productivity slowdown in the quite poor international ranking of Australia's innovative capacity and general competitiveness over the last decade. A problem with this analysis is that in five of the six studies cited, both the US and Sweden appear in the top rankings of innovation and competitiveness. However, both nations have remarkably different industrial relations systems and patterns of labour market regulation.

Industry wide agreements are the predominant form of bargaining in the Swedish system and these cover 91% of employment, trade union density is 68% and 80% of employers are members of employer associations (European Industrial Relations Observatory 2012). In contrast, union density in the US is just 11.8% and just 6.9% in the private sector (International Labour Organization 2012). Bargaining in the US is also highly decentralised. Japan is also highly ranked in these comparative studies of innovation and



competitiveness, though it is characterised by company based unions and strong internal labour markets with long job tenure (Passet 2003), though with a rising 'contingent' workforce. On an index of the 'strictness of employment protection' afforded workers by legislation or industrial bargaining arrangements across 28 OECD nations, the US was ranked first as having the least employment protection for workers and Sweden was ranked 22nd (OECD 2004: 72), around four times more restrictive than the US.

This range of evidence is more consistent with the claim that high innovation performance and competitiveness is compatible with a great variety of industrial relations systems and varying degrees of labour market regulation. Indeed, Australia's period of most significant productivity decline coincided with the most radical deregulation of the industrial relations system through the Work Choices legislation, which was followed by its reregulation through the Fair Work Act. We shall return to the role of innovation and workplace policy later in this paper.

e) Entrepreneurial complacency

Aside from the fading effect of earlier microeconomic reform, an important role is attributed to the rise in national income flowing from terms of trade increases and the shift of national income from wages to profits. Such effortless growth is suggested to lower the incentive on the part of firms to focus on productivity as a source of increased profits: 'As the profit share of Australia's national income has increased to unprecedented levels during the past decade... businesses have in general attached less importance to the pursuit of productivity gains at the enterprise or workplace level' (Eslake & Walsh 2011: 15). Another adverse effect of economic good times in terms of rising incomes and low unemployment is said to be a reduced electoral appetite for further microeconomic reform (Eslake & Walsh 2011: 14).

This explanation is open to question for a number of reasons. No evidence is presented for the effect on the psychology of managers, voters and politicians of economic 'good times'. In sum, the claim is that

the profit motive is an inadequate incentive for effort on the part of managers, and that shareholders are prepared to accept this behaviour. If this is correct, it would imply a worrying degree of short termism on the part of market participants, and that, more broadly, the orthodox assumption of the profit maximising firm is incorrect. This, in turn, undermines the whole basis of the methodology for measuring MFP, as a critical assumption is that firms operate according to the principles of perfect competition.

If the claim is accepted, that rising terms of trade has adversely affected entrepreneurial effort across a broad range of industries, it follows that the mining boom has generated a significant economy-wide negative externality that undermines, in part at least, the benefits of the mining boom. It also follows logically that one policy measure to address the apparent sustained decline in productivity caused by the mining boom is to limit mining investment, output and exports. Alternatively, a sovereign wealth fund could be one means to sequester income gains from the mining boom and delay these 'unearned gains' entering the domestic economy.

Finally, the claim that economic 'good times' reduce entrepreneurial effort is contradicted by the fact that many industries experienced low output growth, or even negative growth, during the last decade, but they too experienced a decline in MFP. For example, manufacturing was adversely affected by exchange rate appreciation and did not benefit, in the aggregate, from the mining boom (as evidenced by flat real output growth over the decade), but it also experienced declining MFP growth.

f) Excess capacity utilisation

Strong growth and rising incomes over the course of the last decade have also resulted in a productivity slowdown due to full or excess capacity utilisation at an economy wide level. Full or excess capacity is where the productive resources of an economy are fully utilised or even more than fully utilised. (The latter occurs when for example, workers' overtime rates increase greatly and equipment is used for production without the necessary 'downtime' for maintenance and replacement.) Full or excess capacity utilisation leads to rising labour costs, inefficiencies or

'bottlenecks' in production such as transport and infrastructure and the employment of less productive labour at the margin (Eslake & Walsh 2011). An obvious problem with this argument is that it stands in clear contradiction to the previous argument that the productivity slowdown was due, in large part, to the rate of productive inputs (capital and labour) exceeding the rate of output in the mining, electricity, gas and water industries. Expressed another way, it was noted earlier that neoclassical economists argued that diminished productivity was due to excessive investment, but now it is also claimed it was due to under-investment or investment not keeping up with the growth of output. It is argued below that the trends in capacity utilisation rates over the last decade are more complex than conventional analysis allows.

It is possible that specific industries did experience excess capacity utilisation. It is well-established that productivity is pro-cyclical, as rising output allows plants to work at or close to maximum rated capacity. This reduces fixed costs per unit of output, notably capital goods, and many 'variable' costs, such as labour, are 'quasi-fixed' due to labour hoarding. Put simply rising capacity utilisation allows more output from the same quantity of inputs and so measured productivity increases. At a certain point however, excessive capacity utilisation introduces a range of rising costs and inefficiencies. The data on trends in capacity utilisation lend partial support for this argument, though the overall picture is quite complex, revealing rising and declining capacity utilisation rates over the decade of the 2000s.

Capacity utilisation rates for the non-farm economy rose dramatically after the deep 1990-91 recession and plateaued for the rest of the decade. However, for 'much of the past decade, capacity utilisation – as measured by various business surveys – rose steadily, reaching unusually high levels. For example, in late 2007 the NAB measure was at its highest level in the two-decade history of the survey, with most industries experiencing high levels of capacity utilisation' (Reserve Bank of Australia 2010). This situation reversed with the onset of the global financial crisis from 2007 to the present with the trend rate of growth of the economy declining (Table 1) and the NAB measure

of capacity utilisation falling rapidly to levels well below the peak (National Australia Bank 2012). Ultimately, the latter trend is not consistent with the claim that the observed decline in MFP is due to excess capacity utilisation.

Movement to full, excess and under capacity utilisation rates over the last two decades can plausibly account for a substantial share of changes in recorded rates of productivity change. However, the data serves to highlight once again the difficulties in estimating productivity and MFP since the ABS productivity measurement methodology is meant to control for such shifts in capacity utilisation. The fact that it is raised by economists as an explanation for the observed productivity trends means that it is not being adequately controlled for.

Moreover, sustained excess capacity utilisation adversely affecting productivity raises questions about the capacity of management to respond to changed conditions and the efficiency of capital allocation by the financial markets. Conversely, the existence of significant surplus production capacity is also difficult to incorporate into the orthodox equilibrium models of the functioning of a competitive economy that assume that resources are fully employed. These assumptions underpin MFP calculations.

g) Government regulation

A further argument is that excessive government regulation, notably that directed at lowering risk 'to life, to property, to public order and safety, to people's savings, to standards of corporate or private behaviour, and so on' can lower productivity when it is enacted without sufficient regard for the costs and benefits of these regulations (Eslake & Walsh 2011: 15). One can hardly but agree with an argument that the benefits of regulation in any specific case should exceed the costs. However, aside from assertion, no evidence is adduced to support the claim that it was a factor in the apparent productivity slowdown of the 2000s.

There is an element of incoherence and contradiction in the orthodox recommendations to improve productivity performance (Eslake & Walsh 2011: 13-14). For example, improving infrastructure planning to ensure greater coordination across projects can entail an increase in government intervention, especially with centralised control over State and local government decision-making. It can also entail closer scrutiny and regulation of private infrastructure and other private investments that affect either the demand for or supply of infrastructure. This would seem to be inconsistent with blanket demands to reduce the role of government and 'red tape'. Other recommendations, for example, to improve the innovation capacity of firms, are at face value commendable. However, the proposed means to achieve this are also inconsistent with the conventional analysis of the causes of the productivity slowdown in that they arguably compound the very government policies which orthodox economists claim created the productivity slowdown. For example, to encourage firm level innovation, Eslake and Walsh (2011: 24) suggest current government 'competition law' should be amended as it 'inhibit[s] the kind of collaboration among firms in the same industry which overseas experience suggests is an integral part of the innovation process in many industries'. Second, there is a problem with the current 'treatment of options by the Australian taxation system [which] inhibits the ability of 'start-up' companies to attract and retain talented staff or to attract institutional investment'.

Enhancing the scope for inter-firm 'collaboration' is fundamentally inconsistent with generalised demands for increased competition of the type envisaged by orthodox economics. Moreover, improving the tax treatment of options may itself contravene orthodox economic policy if it produces a tax 'distortion' by favouring one particular economic activity over another. At face value there is much to commend these recommendations to improve productivity, but they do point to a degree of policy incoherence

when the blanket requirements of neoclassical economic policy confront the reality of specific economic problems and the particular solutions they require. We shall return to these more pragmatic solutions below.

Finally, the advocates of the conventional approach to economic policy for productivity growth need to confront the adverse consequences of these policies on productivity and growth in developed countries over the last five years. It was noted earlier that in the utilities sector a plausible case can be made that microeconomic reform, through a number of mechanisms, has adversely affected productivity in the sector over the last decade. A much broader argument relates to the effect of conventional market-based policies in generating the global financial crisis and the adverse effect of this on economic performance, including productivity.

It is generally accepted that the principal cause of the crisis, and the current growth malaise around the world, was the implementation of market based policies, especially financial deregulation. Financial deregulation created perverse economic incentives in financial markets, corporations and households resulting in the mispricing of risk, huge increase in debt to income ratios, inefficient capital allocation, as evidenced by asset price bubbles, and international current account imbalances. The resulting deleveraging has caused a large and sustained decline in GDP across all developed economies. An indication of the output gap induced by the earlier implementation of neoclassical policies is provided by the OECD in estimates of 'deviations of actual GDP from trend GDP'.¹² These show that over the five years from 2009 to 2013 (the latter year is estimated), annual average GDP growth compared to trend for the US, EU and Australia is -3.9%, -3.3% and -0.5%, respectively (OECD 2012).

The duration and depth of these declines after 2008 exceed, by a factor of two to three, previous negative deviations from trend growth (induced

for example by the usual business cycle recessions). The global financial crisis adversely affects not just economic output but also longer term productivity given the large reduction in capital investment that occurred during the depth of the crisis. Economists in the UK have argued that the global financial crisis and subsequent austerity measures have delivered a 'supply-side' and 'demand-side' shock which will have a long-term constraining effect on GDP and productivity (Martin & Rowthorn 2012). In the case of Australia, relatively restrained GDP growth since 2007, while comparing favourably with many other countries, may be a factor in explaining declining productivity in some industries through the well-established mechanisms of declining capacity utilisation and the existence of fixed and quasi-fixed factors of production.

4. A Policy Agenda for Productivity Growth

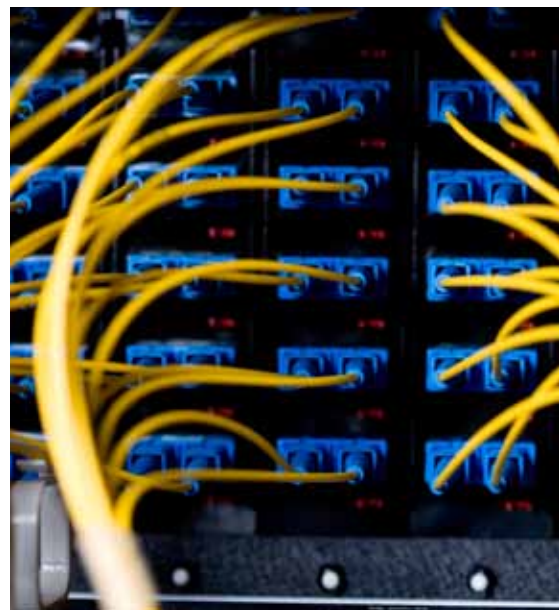
THE STANDARD RESPONSE TO THE PRODUCTIVITY SLOWDOWN IS TO PURSUE AN INTENSIFICATION OF POLICIES BASED ON NEOCLASSICAL ECONOMIC DOCTRINE, WHICH PROMOTE CAPITAL AND LABOUR MARKET DEREGULATION, GREATER COMPETITION AMONGST FIRMS AS A SPUR TO INNOVATION AND PRODUCTIVITY, CONTINUING PRIVATISATION OF GOVERNMENT ASSETS AND CONTRACTING OUT OF REMAINING GOVERNMENT SERVICES.

It has been argued here that these are solutions in search of a problem as the productivity slowdown was more apparent than real in being sectorally specific and linked to factors of a temporary nature.

Further, these neoclassical policies produced an improvement in productivity over the 1990s that was not sustained and, in the case of the privatisation or corporatisation of public utilities, the gains were subsequently reversed as the drivers of measured productivity growth – reduced investment and employment – produced adverse effects. The international evidence is that robust productivity performance is compatible with a wide range of industrial relations regimes and degrees of government intervention in the economy. The evidence does not support the privileging of simplistic deregulation measures as a strategy for boosting productivity growth. Finally, the global financial crisis and the resulting large declines in GDP and productivity (through excess capacity utilisation and disincentive to invest in capital equipment) throughout the developed world is a stark example of the problematic effects of these policies.

In contrast, there are a number of approaches to productivity growth that are not only well supported by research but are more likely to deliver sustainable improvements to living standards in a way that is compatible with greater equity

and improvements to the quality of working life. As indicated previously, enhancing Australia's productivity performance is critical to future living standards, particularly with declining terms of trade and a stubbornly high exchange rate which is hollowing out key export and import competing industries. In addition to well recognised preconditions for productivity growth such as a stable macroeconomic environment, investment in infrastructure and a balanced regulatory environment, three such approaches are briefly considered here.



4.1 Enhanced innovation performance

Innovation entails 'the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations' (OECD and Eurostat 2005: 46). Certain firm expenditures are deemed to be indicators of implemented innovation activity. Examples include investment in R&D; new equipment or software acquired to introduce a new or improved product, service, process or other innovation; trial production and pilot plants; acquisition of patents, technology licences, trademarks; product and process design; marketing of new or improved products and services; and introducing business improvement systems and workforce training related to the introduction of innovations. The scope for innovation activity is thus very wide.

Innovation is important as it is directed overwhelmingly at improving the performance of businesses. It is introduced to improve profits, lower costs, improve quality of products or services, increase revenue and increase market share. Moreover, the evidence that innovation is effective in improving firm performance is overwhelming. For example, the Department of Industry, Innovation, Science and Research (2011: 3) concluded 'that innovative businesses make a vital contribution to Australia's productivity and continued prosperity. Compared to businesses that don't innovate, innovative Australian businesses are twice as likely to report increased productivity; 41% more likely to report increased profitability; twice as likely to export; and up to four times more likely to increase employment and social contributions'.

Despite the clear advantages flowing from firms investing in innovation, the fact remains that only a minority of firms invest in innovation activity at any point in time and that simultaneously Australia lags in its innovation capability. There are a number of explanations for this paradox. In some firms and in some industries and locations, there may be



fewer opportunities and incentives to innovate. Alternatively, expenditure on innovations such as R&D may occur relatively infrequently. For many other firms, however, there are a variety of barriers, or what economists would describe as 'market failures'. These include cost barriers, whereby the cash flow or profitability of firms is insufficient to permit them to invest in productivity enhancing measures.

Alternatively, deficiencies in capital markets may prevent firms accessing sufficient capital at a sufficiently low price to effect improvements. Inadequate information on the part of managers regarding opportunities and benefits of innovation or inadequate management resources to implement change can also inhibit improvements. In addition, as evidenced by a recent survey conducted by the Open Forum for the Society of Knowledge Economics (SKE 2008), key impediments to innovation were identified as 'short-termism' in political and business thinking, underinvestment in education and infrastructure and 'risk-averse' and 'insurance driven' attitudes.

Some innovation can involve multi-firm collaboration to produce useful improvements, such as firms coordinating training activity that can make it economical for a training provider to service a network of firms. In this case the benefits are real but also diffuse, resulting in the 'free rider' problem whereby some firms may wish to gain from an activity but not contribute financially to its implementation. Such free rider behaviour can inhibit innovation. An inadequate supply of skills available to firms in the labour market can also constrain the capacity of firms to innovate. Skill deficiencies create a vicious circle whereby firms are unable to attract the higher level vocational and university skills to innovate and individuals are resistant to investing in their own skills development because there is inadequate demand for higher skills in the labour market. This dilemma is known as a 'low-skill equilibrium' (Finegold & Soskice 1988).

It is important to note that many of these impediments to innovation apply with particular force to small sized firms. Indeed, the data on the propensity of firms to innovate (share of firms in a particular category) and the intensity of innovation (expenditure on innovation as a share of sales or value added) indicates the importance of large firms in innovation.¹³ Large firms (with more than 100 employees) are more than twice as likely to innovate as small firms (with less than 20 employees) and large firms account for the bulk of innovation expenditure despite representing only a small minority of total firms in Australia (Toner 2007: 28).¹⁴

These results suggest an important role for government in facilitating and providing an effective policy framework for innovation. Small and medium sized firms in particular can benefit from technology diffusion and demonstration projects, design capability building, access to high quality business and management improvement services, incentives to undertake capital investment and R&D and support for workforce training. This analysis was supported by the 2008 Cutler Review of the National Innovation System, which noted that:

Many government workplace and innovation programs in Australia are directed at technological or scientific innovation while only a few are directed at strengthening innovation management inside organisations, including leadership and culture...The challenge is how best to promote successful adoption and diffusion of high performance work systems in both the public and private sectors.
(Cutler 2008: 58)

There is also an important role for industry associations and unions to encourage firms to participate in productivity and innovation improvement programs. According to Porter and Schwab (2008:7), in a report published by the World Economic Forum, Australia has reached 'the innovation-driven stage' of development; that is, 'companies must compete through innovation ... producing new and different goods using the most sophisticated production processes'. It is only through the pursuit of ongoing innovation that Australia can maintain its high wages and living standards.

The research suggests that there is a fine balance required in government policy which should, on the one hand, create a business environment encouraging new firm entry but, on the other, should avoid creating 'excessive competition' as this can lead to fragmentation in industry structure and small firm size can be an impediment to innovation. The importance of large multinational firms in global innovation also has important implications for government innovation policy. A business environment should be attractive to the entry of these firms but also ensure maximum technology transfer to Australia. Such firms should be encouraged to transfer leading technologies to their own operations in Australia, to maximise the use of local suppliers and to transfer leading technologies to these suppliers.

Recommendation 1

INNOVATE OR PERISH

Innovative Australian businesses are twice as likely to report increased productivity compared with businesses that don't innovate. Yet Australian innovation performance lags international competitors.

A key to successful innovation is collaboration among businesses and with research and education institutions, with the introduction of new programs such as the 'Industrial Transformation Research Hubs'. Such collaboration can assist knowledge-sharing and overcome coordination failures which impede the development of innovation capability.

Government has an important role in providing a policy framework for innovation. Small and medium firms will particularly benefit from technology demonstration and diffusion projects, design capability-building, access to high quality business improvement services such as Enterprise Connect, incentives to undertake capital investment, support for research and development and workforce training initiatives.

The policy environment should encourage new business models and new firm entry without the 'excessive competition' that can lead to fragmentation of industry sectors and supply chains. Global competitive advantage will be enhanced by innovation clusters and precincts, with support from industry associations and trade unions in promoting enterprise-level innovation capability and performance.

Increasingly, the government is recognising and supporting innovation, including non-technological innovation such as new business models, systems integration and high performance work and management practices and has placed a strong emphasis on the development of management and innovation capability at the enterprise level as part of its productivity-enhancing agenda:

One future focus of the Australian Government's industry and innovation policies will be on building innovation capacity and performance at the enterprise level... Government support for business innovation... must recognise the complexity of the innovation process and the different forms that innovation can take.

(Australian Government 2009: 44, 45).

This approach has been reinforced by the white paper on *Australia in the Asian Century* which notes that, 'Businesses are adopting new models of innovation, focusing more on better integrating internal activities, such as marketing, operations and design, and less on traditional research-intensive approaches. At the same time, they are more open to external ideas and the possibility of new routes to market, engaging with a larger number and wider range of collaborators (Australian Government, 2012). In addition, the report of the Non-Government Members of the Prime Ministers' Manufacturing Taskforce, advocates not only the development of enterprise-level innovation capability but also increased government support for greater collaboration between industry, public agencies and research and education institutions in 'innovation hubs and precincts' (Prime Minister's Manufacturing Taskforce, 2012). This is a prevalent and successful model in high skill, high productivity economies and regions around the world (Green 2008).

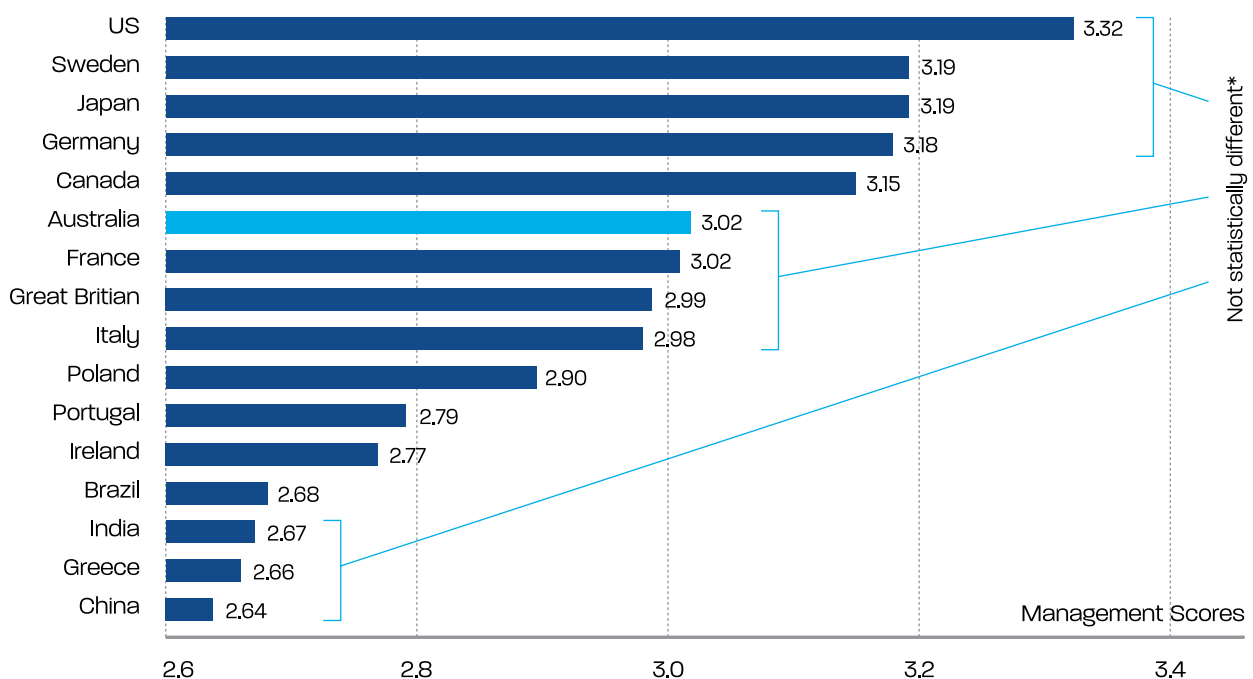
4.2 Improved management capability

The significance of management capability for company performance was emphasised in the Karpin Report (1995), which highlighted the key role of management in innovation and firm performance, as well as in a series of earlier Australian workplace employment relations surveys (Callus et al, 1990; Alexander & Green 1992). Karpin advocated an 'enterprising culture' based on entrepreneurship, leadership development, enhanced diversity management, a management competencies framework and major changes in business schools and management education. The Australian Business Foundation also conducted a study in 2005 which highlighted that Australia ranked poorly in management style and capability, and that Australian managers were 'good at solving tactical and operational problems in a creative way, but lacked the ability to sustain innovation in a strategic way' (Roos, Fernstrom & Gupta 2005: 24).

Subsequently, a detailed research report on management practice and productivity (Green et al 2009) empirically benchmarked Australian manufacturing management against 15 other countries on 18 'capabilities' dimensions (Figure 6). Australian managers lag in a number of dimensions, in particular people management which included aspects of 'instilling a talent mindset' (Figure 7). Poor management performance was found to be closely linked with low educational attainment and

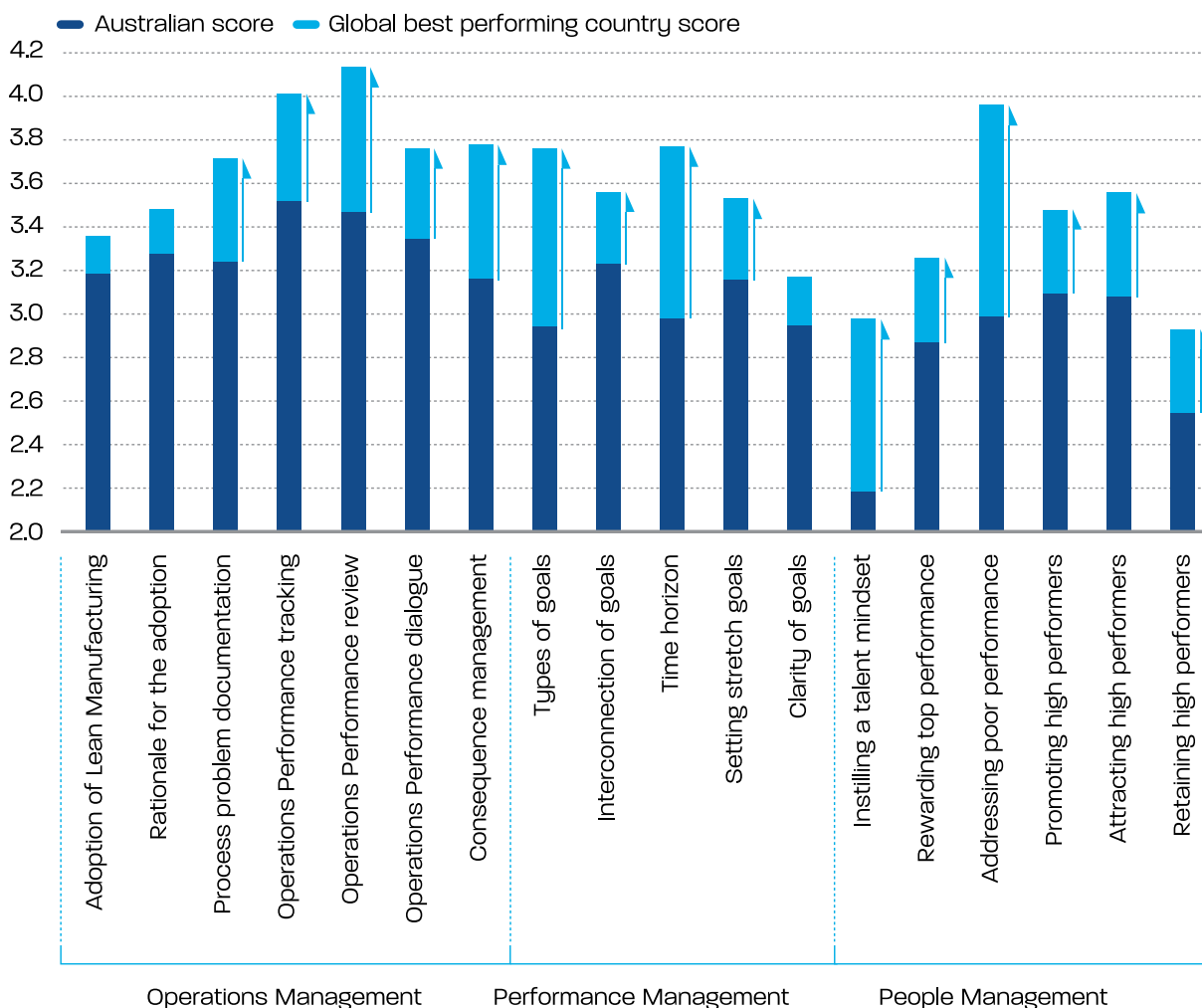


FIGURE 6:
BENCHMARKING AUSTRALIAN MANAGEMENT



Source: Green et al (2009)

FIGURE 7:
MANAGERS LAG GLOBAL BEST



Source: Green et al (2009)

that Australian managers had the lowest proportion of tertiary qualifications across the surveyed countries. Significantly, not all managers regarded good management practices as an essential ingredient of success, and the evidence in Australia and globally is that many managers overrate their overall calibre and are thus unable to make a realistic assessment of the link between their own performance and the productivity of the enterprise (Green et al 2009; Bloom et al 2007).

In the Australian context, Green et al (2009) found that superior management performance was positively correlated with enhanced sales, productivity, market valuation and employment

growth. A single point increase in the five-level management scoring grid was associated with an increase in output equivalent to a 56% increase in the labour force or a 44% increase in invested capital (Green et al 2009: 14). The key conclusion for government policy arising from this international comparative study of management and firm performance was that:

Governments can play their part in encouraging the take-up of good management behaviour... [and] doing so may be the single most cost-effective way of improving the

Recommendation 2

CREATE BETTER MANAGERS

Superior management performance is positively linked to expanded sales, market valuation, employment growth and productivity. Consequently, it is increasingly recognised that the development of leadership and management skills is crucial to the improvement of Australia's productivity performance.

Studies have shown that Australia ranks well behind other advanced economies in management skills and capability, particularly when it comes to engaging workforces in strategic repositioning, branding and design integration, organisational change and, above all, 'instilling a talent mindset'.

While Australia has many world class managers, there is a 'long tail' of poor management performance, which is closely linked with low educational attainment. Significantly, managers in the manufacturing sector have one of the lowest proportions of tertiary qualifications across surveyed countries, hampering our ability to participate effectively as a 'high cost' economy in global markets and supply chains.

Australian governments and businesses must prioritise building innovation and management capability. This should include a focus on management education and leadership development, continuous workplace training and skills formation and initiatives to engage the talent and creativity of Australia's workforce.

performance of their economies...
Relentless improvement in
educational standards is also
essential. Better-managed firms
need more highly skilled workers
and they make better use of them,
while better educated managers
will be a key component of the
performance transformation.
(Bloom et al 2007: 10)

More recently, the Society for Knowledge Economics (SKE) study of the practices of high performance organisations (SKE, 2011: 4) suggests 'that improving Australia's productivity – or effectiveness at work and performance of our workplaces – is and will be largely a function of our commitment to develop leadership and management capabilities across all organisations in our economy'. This is further supported by

Alexopoulos and Tombe (2009) who found that the development of management techniques and intangible processes improve productivity significantly, and also by evidence from a recent UK Department of Business, Innovation and Skills study which concluded that, 'strong leadership and management is a key factor in fostering innovation, unlocking the potential of the workforce and ensuring organisations have the right strategies to drive productivity and growth' (DBIS, 2012: 4).

The SKE study (SKE, 2011: 4) combined conventional financial indicators with five intangible assets, including leadership, innovation, fairness, employee and customer experience to construct a High Performing Workplace Index (HPW Index). Significantly, those firms and organisations with a high score were found to be more efficient at transforming their inputs (eg. cost of assets, such as human capital) into outputs such as revenue for services. For every \$1 of investment, a HPW

generated 12 cents more in revenue than low performing workplaces and the profit margins of HPWs were three times more.

Earlier, the research findings of the WorkUSA survey Driving business results through continuous engagement (Watson Wyatt Worldwide 2008–09) demonstrated that when employees are highly engaged, their companies achieve higher labour productivity and lower staff turnover and provide higher returns to shareholders. In addition, Black and Lynch (2004) found that a third of US output growth stems from productivity-enhancing managerial and organisational innovations at the workplace level, and a UK-based study found that if the management performance of 10% of the bottom two thirds of UK firms was increased to the average performance of the top third, this would add around £1,600 added value per worker per annum – contributing £2.5 billion to the UK's total GDP and raising the trend rate of growth of the UK economy by around 0.25% each year (Work Foundation 2003: 18).

Government has a role in supporting the development of leadership and management skills, but so does industry and the higher education sector. Recent debate has focused in particular on the contribution of business schools and how business education should change to meet the needs of employers, workforces and students. The Australian Business Deans Council with the support of the Australian Government is undertaking a major project on the 'Future of Management Education', which is designed to prototype new approaches to the teaching curriculum and engagement with businesses (Hall, Agarwal & Green, 2012). The project has identified a global trend towards a more integrative approach to learning, with an emphasis on 'boundary-crossing' skills such as teamwork, communication, design thinking and problem-solving, as well as specialised domain knowledge. Whether this approach can be diffused and operationalised across the higher education sector will depend on a combination of public funding and innovative partnerships with industry.

4.3 Workforce development and skills

International research and experience has established that workplace skills are a key driver of productivity, certainly since the pioneering empirical studies of Daly and Wagner for the UK National Institute of Economic and Industrial Research in the 1980s. Since then many other studies have been undertaken on skills acquisition, skills utilisation and skills gaps (Richardson 2007; Toner 2007, 2009; Fisher, Agarwal & Green 2012). Skills acquisition is multifaceted and encompasses basic to higher level technical and managerial skills, where individuals acquire skills and competencies through formal education, training, work experience and other forms of informal learning (Toner 2007, 2009). In competitive environments, 'dynamic capabilities' (Teece, 2009; Agarwal & Selen 2009, Cepeda & Vera, 2007) are also required across whole organisations, in addition to technical skills, which enable workforces to be more productive and in themselves act as a source of growth (Benhabib & Spiegel 1994). According to MacLeod & Clarke (2009), the potential that resides in our workforces is not fully realised, and organisations need to convert this latent potential to productivity gains.

As the report on *Australia in the Asian Century* points out:

Our greatest responsibility is to invest in our people through skills and education to drive Australia's productivity performance and ensure that all Australians can participate and contribute. Capabilities that are particularly important for the Asian century include job-specific skills, scientific and technical excellence, adaptability and resilience. Using creativity and design-

based thinking to solve complex problems is a distinctive Australian strength that can help to meet the emerging challenges of this century. **(Australian Government, 2012)**

The evidence supports a strong causal interrelation between the supply of higher levels of education, training and skills and increased demand for and supply of technical and organisational innovation. Moreover, 'At the core of these ideas is remedying the misallocation of risks and rewards that has emerged as a result of financialisation. The reallocation of risks in recent decades has resulted in significant under-investment in adaptive capacity within workplaces, businesses and key parts of the national economy' (Buchanan et al 2013). At the most fundamental level, it has been shown that investment in capital equipment, innovation and human capital are broadly complementary and mutually reinforcing. That is to say, at an economy-wide level, an increase in the capital-labour ratio and other innovation-related investments such as R&D and organisational re-structuring are associated with an increase in the supply of and demand for higher skills.

A broad range of mechanisms has been identified to account for this cumulative causation within the sphere of production and consumption. These include, for example, the rapid growth in the 'volume' of productive knowledge which requires ever higher capacity on the part of firms and individuals to identify, evaluate and adapt this knowledge. An increased rate of technical change introduces greater 'uncertainty' for firms, which in turn demands an increased capacity for adaptability and more widely distributed problem-solving skills. It is increasingly recognised that higher workforce skills are compelled by an ever-growing intensity of international competition which has shifted the strategy of many firms in developed economies towards competing on quality, design and innovation (Toner 2011). In addition, it is also becoming apparent that the skills and knowledge associated with ICT-enabled

social technologies create significant value and that by adopting these technologies 'companies could raise the productivity of knowledge workers by 20 to 25%' though, importantly 'realising such gains will require significant transformations in management practices and organisational behaviour' (McKinsey Global Institute, 2012: 3).

The problem is that despite these strong positive associations between skills, innovation and productivity, 'low-skill equilibrium' is prevalent in many industries and workplaces. A key driver of the cycles of causation creating such low-skill equilibrium is 'skills under-utilisation', where an individual is either formally over-qualified for their current job or is regarded by their employer as having skills in excess of the requirements for the job. Studies have revealed that a surprisingly large proportion of the workforce is regarded by employers as being over-qualified or over-skilled. Watson (2008: 8) found that 35-50% of employers, depending on the particular industry, regarded their employees as overqualified or overskilled.

This under-utilisation of workforce skills and knowledge represents a major drain on productivity as it means the investment in education and training and accumulated work experience is not being fully engaged. The most effective way to address the problem is the promotion of innovative and participatory work organisation, as this demands the active engagement of the workforce and is strongly associated with skill upgrading and higher productivity. It is noteworthy in this context that the Australian Government has announced the establishment of a new \$12 million 'Centre for Workplace Leadership' to 'encourage higher performing, innovative workplaces and stronger leadership capability in Australian workplaces, to boost productivity and ensure Australian workers truly have quality jobs' (Shorten 2012).

This important announcement is based on 'a substantial and growing body of evidence that shows that leadership, workplace culture and management practices have a significant

impact on workplace performance, productivity, profitability and innovation. It also shows that good leadership which empowers employees delivers greater job satisfaction, productivity and motivation' (Shorten 2012). Clearly the new centre will not be able to prescribe productivity-

enhancing organisational and cultural change, but it will be in a position to facilitate and encourage such change with a more informed and collaborative approach by Australian businesses, unions, workforces and a wide array of education and training providers.

Recommendation 3

MAKE BETTER USE OF SKILLS

Workplace skills are a key driver of productivity improvement. These skills are acquired in a variety of ways, including through formal education, training, work experience and other forms of informal learning.

There is evidence that workforce skills in Australian workplaces are not fully utilised, with research showing that up to half of employers regard their employees as over-qualified or over-skilled. This under-utilisation of skills and knowledge represents a major drain on productivity, and indicates the potential for Australian businesses to increase their performance not only through the provision of new workforce skills but through better utilisation of existing skills.

International research and experience has demonstrated that the most effective way to address this problem is through the promotion of innovative and participatory work organisation. This means active involvement of the workforce to improve workplace performance, job satisfaction and productivity, drawing on world best practice.

We welcome the Australian Government's recently announced 'Centre for Workplace Leadership' which has the potential to take us beyond the industrial relations stalemate. It will be able to play a key role in facilitating and encouraging the necessary transformation of Australian work and management practices and in the organisational culture of our workplaces.

Appendix: Structural Change and Productivity Growth

A KEY ELEMENT IN THE CONVENTIONAL APPROACH TO PRODUCTIVITY POLICY IS THE NOTION OF STRUCTURAL CHANGE OR REALLOCATION OF FACTORS OF PRODUCTION ACROSS DIFFERENT INDUSTRIES TO ACHIEVE A HIGHER RETURN.

Aside from changes in consumer tastes the key driver of structural change is exposure to domestic and international competition. Indeed, the principal benefit of free trade is precisely the reallocation of resources across nations in conformity with their respective comparative advantage. The idea that structural change, which is usually represented as shifts in the proportion of different industries over time in total national output, has a central place in the orthodox conception of productivity growth is well captured in the following quotes.

Aside from technical change 'productivity also grows because of the reallocation of factors of production from low productivity firms to high productivity firms, the exit of low productivity firms and the entry and maturation of new businesses with bright ideas' (Dolman & Gruen 2012: 8). Similarly, Eslake and Walsh (2011: 21) argue that micro-economic reform 'facilitate[s] the movement of factors of production from existing uses to ones in which they can be combined in ways that result in higher levels of productivity overall'.

The reality is far more complex. Most of the employment growth over the 12 years from 2000 to 2011 was in industries that have below average, and in some cases substantially below average, value added per worker. Manufacturing has average value added per hour worked yet it declined substantially, and Information Media and Telecommunications has above average value added per worker yet employment fell.

Industries in red have below average value per hour worked and a positive net contribution to total employment growth; industries in green have above average value added per worker and a positive net contribution to total employment growth; one industry in yellow, Information, Media and Telecommunications made a negative contribution to total employment growth but had above average output per worker; one industry in blue, Agriculture, had below average value added per hour worked and declining employment and Manufacturing had average value added per hour worked but falling employment.¹⁵ The data is consistent with what is broadly known about the drivers of labour productivity as industries that are capital and/or skill intensive have higher value added per hour.

This applies for example to Mining, Electricity, Gas and Water and Telecommunications. Health Care and Social Assistance may appear to be aberrant, but Health Care encompasses not only highly paid medical specialists and other professionals, but also many low paid hospital workers such as nurse assistants, cleaners, cooks, clerical staff and wardsmen. Social Assistance also encompasses activities such as aged care and child care that are comparatively low wage and have a low capital-labour ratio.

Why this complexity? Three reasons are proposed. First, some people are either unwilling or unable to re-train or to re-locate to enable them to shift to different industries. Studies of redundancies from

TABLE 2:
EMPLOYMENT GROWTH AND VALUE ADDED PER HOUR
WORKED BY INDUSTRY

INDUSTRY	INDUSTRY CONTRIBUTION TO TOTAL EMPLOYMENT GROWTH 2000-2011	VALUE ADDED PER HOUR WORKED \$ 2011
Health Care & Social Assistance	20%	43
Construction	14%	52
Professional, Scientific & Technical Services	11%	57
Public Administration & Safety	10%	58
Retail Trade	9%	35
Education & Training	9%	46
Accommodation & Food Services	6%	30
Arts and Recreation Services	3%	37
Administrative & Support Services	3%	55
Other Services	2%	32
Mining	6%	260
Transport, Postal & Warehousing	5%	69
Financial & Insurance Services	4%	188
Electricity, Gas, Water & Waste Services	3%	112
Rental, Hiring & Real Estate	2%	87
Wholesale Trade	2%	74
Information Media & Telecommunications	-1%	112
Manufacturing	-5%	62
Agriculture, Forestry & Fishing	-5%	54
TOTAL	27%	64

Source: ABS Labour Force, Australia, Detailed, Quarterly (Table 4 Employed persons by Industry Original and Table 11. Employed persons and Actual hours worked, Industry and Sex) Cat. No. 6291.0.55.003; ABS Australian System of National Accounts (Table 5. Gross Value Added by Industry. Current Prices) Cat No. 5204.0.

Method: The employment data in column 2 was adjusted for movements in average hours worked over the period. This was necessary to account for changes such as shifts in the share of the workforce in part time employment. (This was done by taking an average of the 4 quarters' measure of hours worked by industry in 2000 and 2011. A proportional reduction/increase in mean weekly hours worked in a given industry between 2000 and 2011 was used to reduce/increase 2011 employment in the industry). Value added per worker was derived by dividing current price industry gross value added by industry employment multiplied by average hours worked per week and allowing 48 weeks of paid work in 2011.

manufacturing industries typically find the 'one-third rule' applies. One third of workers leave the workforce altogether (retire or go onto go onto Disability Pension etc.), one third find a job at a lower rate of pay and with worse conditions and one third find a job at the same or better rate of pay and conditions as their previous job. Similarly, fixed capital is exactly that, so that it is not possible to convert a textile machine into a dump truck for use in the mines. These two factors explain a degree of inertia in the system, in that resources may not shift, or shift quite slowly, from one industry to another.

Second, most of the low productivity industries that experienced employment growth receive 'natural protection' in that they are not subject to import competition. This applies to health care; aged care and child care; retail and education and training, cleaning etc. People need to work and if the only work available to them, given their location, age, education and work experience is in low pay retail for example, they will work in this industry. (This raises the intriguing possibility that, due to the high exchange rate making export or import competing industries uncompetitive, there could

be an increase in the proportion of the Australian workforce employed in low productivity industries subject to natural protection). Third, the relatively low employment growth of high productivity industries is partly a function of capital intensive production methods (so that a 1% increase in output requires fewer people compared to say a 1% increase in the output of aged care or cleaning) and, related to this, the rate of labour displacing technical change is faster in some industries, such as Telecommunications and Financial Services, than others.

An important implication of this pattern of employment growth is that structural change was a key objective of micro-economic reform instituted over the last few decades, but at least since 2000, it has not resulted in a large scale shift of labour to industries with above average rates of output per worker. Indeed, an argument can be made that structural change has actually constrained the rate of productivity growth. The potential role of industry policies in encouraging higher productivity industries, especially manufacturing, was suggested in section 4.



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Footnotes

1. In the 20 years to 2007, the average after-tax incomes for the top 1% of US households rose by 281%, the middle fifth by 25% and the bottom fifth by 16%. As a result, in 1976, the top 1% of US households accounted for almost 9% of pre-tax income, but by 2008 this had more than doubled to 21%. The top 10% accounted for almost a half of all salary income in 2007, but during 1993-2010 over half of real income gains went to the top 1% (Congressional Budget Office www.cbpp.org/files/6-25-10inc.pdf). It has been noted that these extremes were last seen just prior to the Great Depression (Piketty & Saez, 2003, updated to 2008 at <http://emlab.berkeley.edu/users/saez>). In Australia, the share of the top 1% also doubled over this period to reach 11%.
2. The circular reasoning involved in calculating the 'productivity' of a factor of production by using the share of national income going to that factor has long been recognised.
3. The Australian Bureau of Statistics is commendably transparent about these assumptions, including the sensitivity of its MFP estimates to these assumptions and the limitations in data availability to construct MFP estimates (ABS 2007: Ch1 2009.)
4. OECD (2008), *Compendium of Productivity Indicators 2008*, OECD, Paris, p. 7.
5. The major characteristics of the neoclassical or neo-liberal agenda are reduced size of government in GDP, privatisation of state assets, contracting out of remaining government services, labour market deregulation and liberalised international capital and trade flows. It is also known as the 'Washington Consensus'.
6. Quiggin (2011) argues there were three phases in the history of micro-economic reform in Australia. 'In the first, deregulatory, phase, the main focus was on rationalising public intervention in private sector markets, with the object of 'getting prices right'. In the second phase, referred to here as the 'privatisation' phase, attention shifted to market-oriented reforms of the public sector, including corporatisation and competitive contracting as well as privatisation. In the third 'competitive regulation' phase, the idea of deregulation was replaced by regulation designed to produce, or simulate, competitive market outcomes
7. The Productivity Commission suggests a similar explanation for the EGW productivity performance. 'An overhang of supply capacity resulting from excessive investment in the 1970s and early 1980s, together with structural reforms that allowed utilities businesses to shed excess labour, meant that utilities output grew strongly from the mid-1980s to the late 1990s on the back of negative (measured) input growth. This was a primary driving force behind the very rapid growth in measured productivity in the division during that period' (Topp & Kulys 2012: 125). The so-called excessive investment from the mid 1970s to the 1980s was due in large part to the 'resources boom', in coal production and mineral processing, the latter especially in electricity intensive aluminium.
8. The NSW IPART (2011: 4) similarly finds that the regulatory system provides only 'weak incentive for productivity improvement' because it 'allows the businesses to earn a return on all capital invested regardless of its efficiency and prudence, by requiring the AER [Australian Electricity Regulator] to roll all capital expenditure into the asset base'.

9. This explanation is complementary to the earlier discussion of the Productivity Commission results which emphasised cyclical factors such as drought, changes to consumer behaviour or other regulatory imposts relating for example to higher environmental standards, which increased capital expenditure in relation to demand.
10. The latter can involve incentives to utilities to encourage consumers to reduce demand for the output of the utility. A recent example of the difficulties of imposing a pricing regime designed to achieve multiple objectives on a monopoly supplier is the recent threat by AGL to cease supplying electricity into NSW given suggestions by the state government emulate the pricing decisions of the Queensland pricing regulator (*Sydney Morning Herald* 'AGL will halt power sales if prices are set too low' Business Day, p.3, August 23 2012).
11. The OECD (2004: 80) reached a similar conclusion 'theoretical analysis does not provide clear-cut answers as to the effect of employment protection on overall unemployment and employment.' It also studied the relationship between bargaining arrangements and performance, and concluded that 'the impact of the organisation of collective bargaining on labour market performance appears to be contingent upon other institutional and policy factors and these interactions need to be clarified in order to provide robust policy advice'. Australia scores the second lowest in the World Bank rigidity of employment index (REI), closely following the US, and has a highly 'flexible' labour system. The REI is a simple average of three indices (The World Bank, Doing Business 2008):
 - ▣ Difficulty of hiring index: Applicability and maximum duration of fixed-term contracts and minimum wage for trainee or first-time employee.
 - ▣ Rigidity of hours index: Scheduling of non-standard work hours and annual paid leave.
 - ▣ Difficulty of firing index: Notification and approval requirements for termination of a redundant worker or a group of redundant workers, obligation to reassign or retrain and priority rules for redundancy and reemployment.
12. These deviations can be either positive or negative. In many years in the OECD series actual GDP growth exceeds potential growth.
13. This pattern applies to innovation expenditures in aggregate. For R&D however, which is a component of innovation, the relationship is somewhat more complex. Studies find there is an inverted-U shape in terms of firm size and R&D intensity. This is to be expected as even large innovative firms typically start off small. The picture is complicated however, by the fact that many small R&D firms are 'spin-offs' from larger firms in which the latter retain a financial and sometimes ownership interest (Argyrous 2000).
14. Despite the empirically well established importance of large firms, and especially multinational large firms, in innovation it is interesting to note that orthodox policy advice to encourage innovation gives particular weight to the focus on promoting the entry of new small firms and to the role of discovery and experimentation by small firms in terms of introducing new technologies and investigating market opportunities (Dolman & Gruen 2012). There appears to be a conflict between the policy advice and the evidence cited in the Treasury report. For example, referring to recent studies on management practices and their effects on firms performance it is noted that 'What is particularly fascinating about these studies is what they show about the determinants of good and bad management practices across Australian firms...One of the key findings is that size matters: large companies tend to be much better managed than small ones. This may be important for Australia because, while the international survey considered only firms employing 100 or more

workers, Australian manufacturing has a larger proportion of very small firms, with fewer than 20 employees, than almost all other OECD countries' (Dolman & Gruen 2012: 10-11). These studies show that better managed companies also have higher productivity. Other studies also find that the most important predictors of whether firms will innovate are large firm size and firm's high share of the market. These are much stronger predictors than factors related to the orthodox view of competition such as number of competitors are firm claims to have in a given market (Soames, Brunner & Talgaswatta 2011: 23-24).

15. The orthodox response to the apparent conundrum that the market does not always result in the movement of resources to the highest return use is well summarised in the following. 'Of course, it would in theory be possible to boost aggregate productivity by encouraging the movement of labour and capital from industries in which productivity is typically low (such as retailing or hospitality) to industries in which productivity is typically high (such as mining, or finance and insurance). However, that only makes sense if there is sufficient demand to absorb the increased output from those sectors. Households and businesses want the output of low-productivity industries as well as high-productivity ones, and there is thus a trade-off between productivity and 'allocative efficiency' (producing the goods and services which people want to buy, directly or indirectly through public provision)' (Eslake & Walsh 2011: 8). The fact that orthodox economics proposes contradictory arguments, that structural change both promotes and negates productivity growth, is an example of Nicholas Kaldor's dictum that the core propositions of orthodox economics cannot be empirically falsified. This is one of the factors behind its resilience in public policy.



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