Economic *Roundup*

Issue 3, 2008

ISBN 978-0-642-74476-0

The views expressed in the Economic Roundup are commentary only, and should not be considered as advice. You should not act in reliance upon the views expressed in the publication, but should seek independent professional advice in relation to these issues and any proposed actions.

The Commonwealth and the authors disclaim responsibility for loss or damage suffered by any person relying, directly or indirectly, on this publication, including in relation to negligence or any other default.

Internet

A copy of this document appears on the Treasury website at:

www.treasury.gov.au

Purchasing copies

Over the counter at:
16 Nyrang Street, Fyshwick ACT

Canprint Telesales:

Toll Free 1300 889 873

(Operator service available between 8 am and 5 pm AEST weekdays.
Message facility available for after hours calls.)

Canprint Mail Order Sales:

PO Box 7456
Canberra MC ACT 2610

By email at:
sales@infoservices.com.au

Printed by Canprint Communications Pty Limited

CONTENTS

Economic geography and economic performance in Australia

Joann Wilkie and Tony McDonald[1]

The OECD has found that Australia's economic performance is not as strong as might be expected given the strength of its economic policy settings. Differences in geography — distance to world markets, natural resource endowments, and population settlement patterns — help explain differences in economic performance across OECD countries. However, these findings reinforce, rather than reduce, the importance of good policy. Economic policy settings affect the extent to which countries exploit their geographic advantages and their ability to adapt to geographic disadvantages. The purpose of this paper is to review the OECD's recent study of the impact of geography on economic performance and consider the implications for Australia's economic performance and policy.

1 The authors are from Macroeconomic Policy Division, the Australian Treasury. This article has benefited from comments and suggestions provided by Jyoti Rahman and Dominic Regan. The views in this article are those of the authors and not necessarily those of the Australian Treasury.

Introduction

The ultimate goal of economic policy is to improve the wellbeing of Australians. One element of wellbeing is standard of living or gross domestic product (GDP) per capita. Cross-country analysis can improve our understanding of the factors that affect GDP per capita, thereby helping us implement economic policy that is effective in improving standards of living.

OECD analysis has confirmed the importance of economic policies for GDP per capita. However, economic policy alone does not explain all of the difference in GDP per capita across OECD countries. Australia's economic policy settings have been assessed by the OECD as being close to best practice, in many of the areas identified as important. Despite this Australia's GDP per capita lags behind that of the leading OECD countries.

Economic geography is one of the other factors that can explain part of the cross-country differences in GDP. Economic geography refers to the location, distribution and spatial organisation of economic activities. Various elements of geography and history can influence the spatial aspects of economic activity, including a country's location in the world, climate, topography, natural resource endowments, and size and population settlement patterns. In its 2008 *Going for Growth* publication the OECD examined the impact of economic geography on GDP per capita across OECD countries.

The first section of this paper provides an overview of the sources of economic growth. The second section explains how geography affects economic performance. The third section reviews the OECD's recent work on the impact of economic geography on GDP per capita. The fourth section considers some broad policy implications of Australia's geography. The final section concludes.

Sources of economic growth

In 2003, the OECD published *The Sources of Economic Growth*, the culmination of a four-year project analysing the causes of differences in economic performance across OECD countries. The project also identified reforms that could improve countries' long-term growth prospects.

The OECD used the Solow-Swan model augmented with human capital to explain the differences in GDP per capita levels and growth patterns.[2] In this model, GDP per capita is assumed to be a function of physical and human capital, labour and

2 See Solow (1956) and Swan (1956).

the level of technology. This model has been widely used due to its simplicity and flexibility (Boulhol, de Serres & Molnar 2008).

The OECD then added a wide range of policy variables to the basic model to see whether they were able to explain GDP per capita variations among OECD countries. For technical reasons, these additional variables were not added to the model all at once but were introduced one at a time. The key results are outlined below.

Improvements in the quantity and quality of physical and human capital that lead to capital-deepening support higher GDP per capita. The OECD (2003) estimated that a 1 percentage point increase in the accumulation of physical capital could lead to an increase in long-run GDP per capita of 1.3 per cent.[3] For human capital, an additional year of education, on average, (corresponding to an increase in human capital of about 10 per cent) could lead to an increase in long-run GDP per capita of 4 to 7 per cent.

A number of policy and institutional variables were found to have a significant impact on GDP per capita. These included: the inflation rate; the variability of inflation; the tax burden; the intensity of business research and development (R&D); and trade exposure (Table 1). These variables are proxy measures for macroeconomic and microeconomic policy settings.

Lower and more stable inflation rates reduce uncertainty, improve price signals and decision making. The OECD (2003) estimated that a reduction in the inflation rate of one percentage point could lead to an increase in GDP per capita of 0.13 per cent. If the variability in inflation is also reduced then the increase in GDP per capita could be larger. For example, a decrease of one percentage point in the standard deviation of inflation could lead to an increase in long-run GDP per capita of 2 per cent.

The overall size of government, the composition of expenditure and the structure of taxes used to finance expenditure may affect GDP per capita. The OECD recognises that many components of public expenditure, such as health, education and infrastructure, are likely to be beneficial for GDP — at least up to a certain level. However, they also note that the taxes required to finance government expenditure may reach levels where the negative effects on incentives and investment decisions may outweigh the positive effects. The OECD (2003) estimates that a one percentage point increase in the tax burden decreases long-run GDP by 0.6 to 0.7 per cent.

More recently, the OECD has shown that the structure of taxes — the degree to which a country relies on income taxes, social security contributions, and taxes on goods and services — can also impact on GDP per capita (Arnold 2008).

3 Physical capital accumulation was measured by an investment to GDP measure: the ratio of real private non-residential fixed capital formation to real private GDP.

Innovation, leading to new products, services and business processes, is a key determinant of GDP per capita in the long run. Innovation is usually measured by business expenditure on R&D. However, business expenditure on R&D is an imperfect measure of innovation. Innovation includes a much wider array of activities in the economy, including workforce skills, management, venture capital, adoption of new technology, work reorganisation, and public expenditure on R&D. Having low business expenditure on R&D does not necessarily mean a country has low levels of innovation. In addition, the level of business expenditure on R&D in a country is dependent upon other factors, such as industry structure and exposure to international trade and investment (Davis & Tunny 2005; Tunny 2006). The OECD (2003) estimated that an increase in business R&D intensity of 0.1 percentage points of GDP increases GDP per capita by 1.2 per cent.

Exposure to international trade allows countries to specialise, and it brings additional benefits through economies of scale, exposure to competition and diffusion of technology and knowledge. The OECD (2003) estimated that an increase in trade exposure of 10 percentage points increases long-run GDP per capita by 4 per cent.

Table 1: Impact of changes in policy factors on GDP per capita

Factor	Proxy	Change	Impact on GDP per capita (per cent)
Level of inflation	Rate of growth of private consumption deflator	+ 1 %	- 0.13
Variability of inflation	Standard deviation of the rate of growth of the private consumption deflator	+ 1 %	- 2
Tax burden	Tax and non-tax revenue as a percentage of GDP	+ 1 %	- 0.6 to - 0.7
Innovation	Business expenditure on R&D as a percentage of GDP	+ 0.1 %	+ 1.2
International trade	Weighted average of export intensity and import penetration as a percentage of GDP	+ 10 %	+ 4

Source: OECD 2003.

In addition, the OECD (2003) found that there were a number of other policy variables that could also be important to understanding differences in GDP across countries. These included product and labour market flexibility, the development and diffusion of new technologies, and the ability of financial systems to direct capital to their most efficient use. Unfortunately, due to a lack of time-series data and poor proxy measures, the OECD was not able to include these variables in its model in the sources of economic growth study. However, it did find that these policy variables are associated with higher GDP.

The Sources of Economic Growth substantially improved our understanding of the determinants of economic growth, highlighting and quantifying, the impact that economic policy can have on GDP per capita levels and growth.

However, economic policies are not able to explain all of the difference in GDP per capita across OECD countries. Economic reforms undertaken in Australia in the past quarter century mean that Australia's economic policy settings on many of the areas analysed by the OECD are close to best practice. Australia's economic performance is not as strong as might be expected given Australia's overall favourable policy settings.

In its annual *Going for Growth* publication the OECD, extends the work undertaken in *The Sources of Economic Growth* by undertaking thematic studies to look at specific policies and factors that influence GDP per capita. In the 2008 publication, the OECD examined the impact of economic geography on GDP per capita.

Why geography matters

Geography encompasses a number of elements, including a country's location in the world, climate, topography, natural resource endowments, size and population settlement patterns. The two most commonly examined variables are distance from world markets and natural resources. These factors primarily affect GDP per capita by influencing productivity and income.

Distance from world markets

Distance from world markets directly increases transport costs, which has the effect of reducing trade. A reduction in trade limits opportunities for countries to specialise in the activities where they have a comparative advantage. It also limits access to economies of scale, exposure to competition and diffusion of technology. As a result, productivity is likely to be lower in countries that are distant from world markets.

In Australia, distance from world markets has been found to have a significant impact on trade and productivity levels. Battersby and Ewing (2005) found that if Australia were as close to world markets as the United Kingdom, Australia's level of trade would be expected to increase by around 50 per cent. Battersby (2006) estimated that distance from world markets accounts for around 45 per cent of the gap in labour productivity between Australia and the United States. Tunny (2006) found that Australia's distance from world markets has limited its exposure to foreign R&D.

Distance from world markets can also affect income levels. A remote country has to absorb transport costs into producer prices of tradeable goods and services in order to remain competitive in world markets. Because the factor price of capital tends to be

equalised across locations labour often bears the cost of remoteness. Even if technologies are the same everywhere, firms in remote countries can only afford to pay relatively lower wages (Redding & Venables 2004).

Distance between domestic markets is also likely to affect productivity and income for similar reasons. Densely populated countries, with large population centres within reasonable proximity, are likely to benefit from more effective labour and product markets — as firms locate near to each other they will benefit from having a large pool of suppliers, customers and labour, reducing costs, increasing market size, raising competitive pressures and allowing a greater degree of specialisation. They may also benefit from lower infrastructure costs and spillovers associated with the clustering of innovative activities. However, congestion costs limit the benefits of agglomeration.

Dolman, Parham and Zheng (2007) and Davis and Rahman (2006) found that Australia's sparse population settlement pattern across its vast internal spaces (a product of both geography and history), in combination with its distance from world markets, negatively affected productivity by limiting the benefits available from specialisation, economies of scale and competition between producers.

Natural resource endowments

A country, like Australia, that has abundant natural resources benefits from the rent received from extraction and also from the low cost of inputs to production. The extent to which a country benefits from these rents depends on the effectiveness with which it collects and invests them.

Natural resources can impact on GDP per capita either positively and negatively. If a country has an abundance of a commodity whose relative price on world markets has increased then the economy is effected in two ways (Gregory 1976; Corden & Neary 1982; Corden 1984). First, the rise in demand for labour and capital in the commodity sector leads to a shift in labour and capital away from the manufacturing and non-tradeable sector. Second, the extra income generated by the rise in the commodity price increases the demand for manufactures and non-tradeable services. Increased demand for non-tradeables increases their price relative to the price of traded goods, resulting in an appreciation of the real exchange rate. The appreciation of the exchange rate reduces the international competitiveness of manufactures.

These adjustments are an efficient response to a relative price change and result in higher real income. However, if the adjustment to the change in relative price is obstructed, or if resources are not reallocated following a rise in the price of the commodity, then GDP per capita will be lower than it would otherwise be.

There is an additional channel through which natural resource endowments can negatively affect long-term GDP per capita. If countries with abundant natural resources are exposed to rent-seeking behaviour by those that control the resources then corruption and misallocation of resources may mean resource rents are used inefficiently, leading to a reduction in GDP per capita (Sachs & Warner 1995; Gylfason 2007).

Strong political and legal institutions raise the possibility that resource rents will be used efficiently. However, even in countries with strong institutions resource rents may have adverse long-run effects on growth by reducing incentives to undertake economic reforms, increasing macroeconomic instability if rents are spent freely, raising protectionist pressures in response to the decline of manufacturing, or investing in projects that fail the market test, for example, channelling resources to declining industries (Boulhol, de Serres & Molnar 2008).

Geography has an important influence on a country's economic performance. The OECD has extended its analysis of the sources of growth to quantify the impact that economic geography has on GDP per capita.

Economic geography and GDP per capita

In the 2008 edition of *Going for Growth*, the OECD analysed the impact of economic geography on GDP per capita using a similar methodology to that used in the original study. The economic geography variables of proximity to world markets and natural resource endowments were added to the basic model one at a time to determine their impact on GDP per capita (Boulhol, de Serres & Molnar 2008).

The initial estimation of the model, including only the basic determinants of physical and human capital accumulation, labour, and the level of technology, explained only one-third of the variation in GDP per capita across countries. The inclusion of the economic geography variables increased the variation explained by the model to one-half. Adding the individual policy variables would further increase the amount of variation explained. This represents a significant improvement in our understanding of the factors that affect economic prosperity.

The impact of economic geography on GDP per capita

The OECD (2008) estimates that distance to markets and natural resource endowments have a significant impact on GDP per capita in OECD countries (Table 2). Taking Australia as an example, the OECD finds that the distance from Australia to world markets contributed to lowering Australia's GDP per capita by 10.6 per cent on average between 2000 and 2004 relative to the average OECD country. Australia is the

OECD country most disadvantaged by its distance from world markets, while the centrally located countries of Belgium and the Netherlands benefit the most.[4]

Table 2: Impact of geography on GDP per capita, average 2000 to 2004
Difference compared to the average OECD country

	Distance to markets (per cent)	Natural resources (per cent)
Australia	-10.6	1.7
Austria	1.8	-0.8
Belgium	6.7	-1.2
Canada	2.1	1.7
Denmark	2.2	0.3
Finland	-2.4	-1.0
France	3.4	-0.7
Greece	-3.7	-1.1
Ireland	0.6	-0.7
Italy	1.3	-0.8
Japan	3.0	-0.8
Netherlands	5.6	-0.5
New Zealand	-10.1	-0.5
Norway	-1.5	8.5
Portugal	-2.7	-1.3
Spain	-1.2	-1.0
Sweden	-1.4	-0.6
Switzerland	3.3	-0.7
United Kingdom	3.8	0.1
United States	-0.3	-0.6

Source: OECD 2008.

The OECD (2008) found that the distance to world markets reduces trade to a similar extent today as it did in 1970. The unchanged sensitivity of trade to distance belies the commonly held view that falls in transport costs as a result of technological advances, such as containerisation and better jet engine technology, have reduced the relevance of distance for trade. Using new transport costs data, the OECD found that real average international transport costs for Australia and New Zealand more than doubled between 1973 and 2006.[5]

It may be that rising fuel costs and port and airport charges have offset the gains from technological innovations in the transport industry. Alternatively, the benefits from

4 New Zealand is the most remote country in the OECD, but because it is located near Australia, which is a much larger market, the impact of distance to world markets on GDP per capita in New Zealand is less than the impact in Australia.

5 The OECD constructed a new set of indicators to measure transport costs, calculating country-specific transport costs per kilogram transported (Golub & Tomasik 2008). Real total average transport cost is a weighted average of maritime, air and road transport costs. The average cost is expressed in $US per kilogram deflated by the US manufacturing goods deflator, with 2000 as the base year.

technological improvements may not have been as large as assumed (Boulhol, de Serres & Molnar 2008).

On the other hand, the OECD (2008) found that international communication costs have fallen to very low levels in OECD countries. This has facilitated trade in services and the transfer of some parts of the production process to more distant areas. However, the extent to which certain business processes or services can be conducted remotely is dependent upon the extent to which the information being transmitted can be codified (Withers 2007).

Natural resources benefited Australia, contributing 1.7 per cent, on average, to GDP per capita compared to the average country. Similarly, the other resource-rich OECD countries (Norway, Canada, Denmark and the United Kingdom) all benefited.

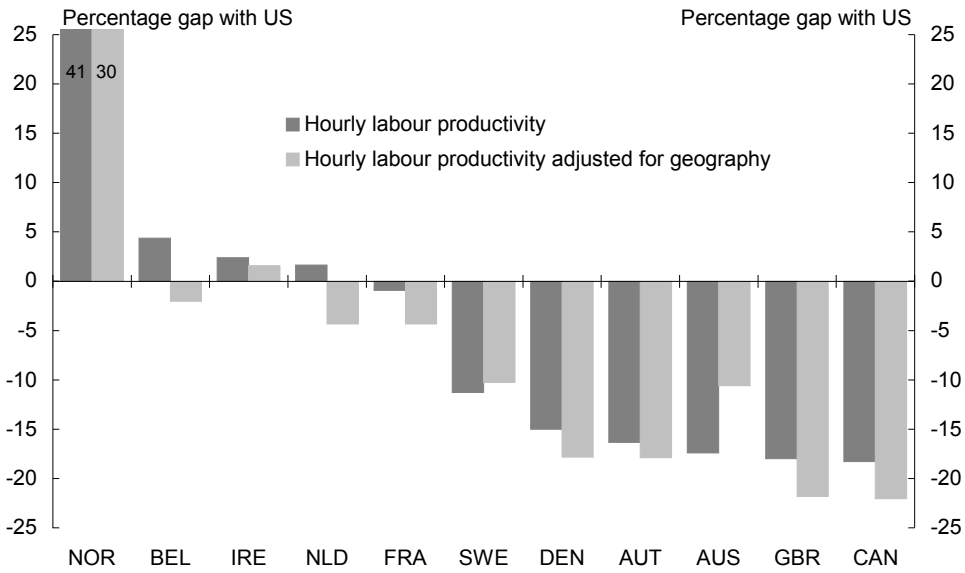
The positive contribution of natural resources to GDP per capita implies that OECD countries have not suffered from the resources curse. This contrasts with other studies, such as Sachs & Warner (1995), which found that natural resources have a negative impact on economic performance. A key difference between the OECD's work and other studies is the sample of countries used: while the OECD considers 21 OECD countries, the other studies tend to use a sample comprised of both developed and developing countries. The relative strength of institutions and governance in OECD countries is likely to be a key factor in the positive contribution of natural resources to GDP per capita as they allow resource rents to be collected and invested effectively (Collier 2007).

Geography reinforces policy priorities

Geography is essentially a given and there is little, if anything, government can do to affect it. Having quantified the impact of economic geography on GDP per capita, the OECD (2008) then adjusted each country's performance for its geographic advantages and disadvantages to determine underlying performance, which can be influenced by economic policy.

Economic geography primarily influences GDP per capita by affecting productivity. As a result, the OECD (2008) compares actual labour productivity with labour productivity adjusted for geography (Chart 1). Each country's productivity is measured relative to the United States.

Chart 1: Actual and adjusted hourly labour productivity, 2006
Percentage gap vis-à-vis the United States, total economy, selected OECD countries



Note: The 11 best productivity performers in the OECD are shown. Both measures of productivity performance are relative to the US.
Labour productivity is measured as GDP per hour worked. This is then adjusted to take into account the estimated effects of both access to markets and natural resources. Only the countries covered by the OECD's empirical analysis are shown.
Source: OECD 2008.

For Australia, adjusting labour productivity for geography reduces the productivity gap with the United States from around 17 per cent to just over 10 per cent. This helps explain why Australia's GDP per capita continues to lag behind that of the leading OECD countries, despite Australia's favourable economic policy settings. Policy improvements in Australia are capable of narrowing the productivity gap, but the scope for improved performance may be limited because of Australia's distance from world markets.

Belgium and the Netherlands are the two countries with the most favourable locations in the world. Labour productivity in these two countries is slightly higher than the United States, but once adjusted for geography, it falls slightly below that of the United States. That is, once their favourable geography has been taken into account, there is still significant scope for these countries to improve economic performance by improving economic policy. This reinforces the importance of good policy and implies that countries' economic policy priorities to improve productivity and labour utilisation remain the same, regardless of their geography.

Distance between internal markets also matters

One weakness of the OECD's study of the importance of geography for GDP per capita is that it does not capture the impact of population settlement patterns. The market potential indicator, used by the OECD to measure distance from world markets, includes internal distance, which is measured simply but sometimes inappropriately.[6] It does not take into account the possibility that a country's domestic market could be fragmented into regional markets, as in Australia, where the majority of the population is found in the coastal fringe on the eastern seaboard.

Measuring internal distance in a way that more accurately reflects settlement patterns is important because of the impact of internal distance on GDP per capita. Australia has a relatively small population scattered across a vast land mass. The large distances between Australia's internal markets likely has a negative effect on productivity.

Broad policy implications for Australia

Whether a country is able to exploit geographic advantages or overcome geographic disadvantages depends on the policy framework within which individual firms make their decisions. Geographic advantages and disadvantages, whether due to proximity or distance to world markets, dense or sparse population settlement patterns, and rich or meagre resource endowments, do not affect what are good economic policy settings to improve productivity and labour utilisation. It follows that geography should not be used as an excuse for bad policy.

Australia has proved successful at extracting its rich natural resources deposits. The Australian mining industry is one of the most productive in the world with a productivity level in 2000 over one-and-a-half times that in the United States (Young, Wilkie, Ewing & Rahman 2008). Australia's strong political institutions also mean that Australia has not suffered from a misallocation of resource rents. Economic reform in Australia over the past quarter century has resulted in a flexible competitive economy able to adjust to external shocks like commodity price increases.

On the other hand, Australia's geography is likely to be an ongoing limiting factor and contribute to low productivity in industries like manufacturing, where Australia's productivity level is only around 60 per cent of the level in the United States (Young, Wilkie, Ewing & Rahman 2008). Australia's market is small and fragmented and for

6 This measure gives more weight to countries that are large, dense and close together. It also takes into account each country's domestic economy. Internal distance is usually smaller than external distances; as a result, it is associated with greater weight. The underlying assumption used to measure internal distance is that a country is a disk where all suppliers are located in the centre and consumers are located uniformly over the area.

much of Australia's history tariff barriers isolated its manufacturing firms from large foreign markets. As a result, Australian manufacturers are unable to access the same economies of scale that firms in the United States are able to access in their own large and well integrated domestic market.

Good economic policy will facilitate the adaptation of firms to Australia's geographic advantages and disadvantages. Policies that seek to subsidise firms for the higher costs associated with Australia's distance from world markets provide a benefit to those firms that are disadvantaged by distance but penalise those that are not affected by distance. The effect of such subsidies would be to limit the extent to which firms adapt to geography.

Conclusion

In *Going for Growth*, the OECD (2008) has shown that economic geography significantly helps explain differences in GDP per capita across OECD countries. The OECD found that distance to world markets reduces GDP per capita in remote countries. Distance remains an important influence on trade and productivity levels. The OECD also found that abundant natural resources increase GDP per capita. This finding implies that strong political and legal institutions in OECD countries have helped them avoid the negative effects of abundant natural resources.

These results have important implications for policy as economic geography explains more of the differences in GDP per capita. Taking economic geography into account does not change a country's policy reform priorities.

This work has particular importance for Australia. While Australia has favourable economic policy settings, its GDP per capita continues to lag behind the leading OECD countries. Economic geography explains part of this gap. Australia is one of the most remote countries in the OECD and our distance from world markets has a large negative impact on GDP.

On the other hand, Australia's abundant natural resources have a positive impact on GDP per capita. Strong institutions and a flexible economy mean that Australia has escaped the resource curse. However, the positive contribution of natural resources to GDP per capita is not large enough to offset the impact of distance.

While the OECD has quantified the impact of distance and natural resources on GDP per capita, further work needs to be done in determining the size of the impact of population settlement patterns on GDP per capita. Australia's vast internal spaces are likely to have a significant negative impact on GDP per capita.

Economic policy can do little to change geography itself, but economic policy still has an important influence on economic performance and the wellbeing of Australians. Indeed, good economic policy helps a country exploit and maximise the benefits from its geographic advantages. Good policy also helps a country to adapt to and minimise the costs associated with geographic disadvantages.

References

Arnold, J 2008, 'Do Tax Structures Affect Aggregate Economic Growth? Empirical Evidence from a Panel of OECD Countries', *OECD Economics Department Working Papers*, forthcoming.

Battersby, B 2006, 'Does Distance Matter? The Effect of Geographic Isolation on Productivity Levels', *Treasury Working Paper*, 2006-03, April, Treasury, Canberra.

Battersby, B and Ewing, R 2005, 'International Trade Performance: The Gravity of Australia's Remoteness', *Treasury Working Paper*, 2005-03, June, Treasury, Canberra.

Boulhol, H, de Serres, A and Molnar, M 2008, 'The Contribution of Economic Geography to GDP Per Capita', *OECD Economic Department Working Papers*, no. 602, OECD, Paris.

Collier, P 2007, *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It*, Oxford University Press.

Corden, M and Neary, J 1982, 'Booming sector and de-industrialisation in a small open economy', *Economic Journal*, 92: 825-848.

Corden, M 1984, 'Booming sector and Dutch disease economics: survey and consolidation', *Oxford Economic Papers*, 36: 362.

Davis, G and Rahman, J 2006, 'Perspectives on Australia's productivity prospects', paper presented to the Australian Bureau of Statistics and Productivity Commission Perspectives Conference, 23 March, Canberra.

Davis, G and Tunny, G 2005, 'International comparisons of research and development', *Economic Roundup*, Treasury, Spring.

Dolman, B, Parham, D and Zheng 2007, 'Can Australia Match US Productivity Performance?', *Productivity Commission Staff Working Paper*, Productivity Commission, Canberra.

Gregory, R 1976, 'Some implications of the growth of the minerals sector', *Australian Journal of Agricultural Economics*, vol. 20 no. 2.

Golub, S and Tomasik, B 2008, 'Measures of International Transport Cost for OECD Countries', *OECD Economic Department Working Papers*, no. 609, OECD, Paris.

Gylfason, T 2007, 'The international economies of natural resources and growth', *CES IFO Working Papers*, no. 1994.

OECD 2003, *The Sources of Economic Growth in OECD Countries*, OECD, Paris.

OECD 2008, 'Economic Geography and GDP Per Capita', in *Economic Policy Reforms: Going for Growth*, OECD, Paris.

Redding, S and Venables, A 2004, 'Economic Geography and International Inequality', *Journal of International Economics*, vol. 62.

Sachs, J and Warner, A 1995, 'Natural Resource Abundance and Economic Growth', *NBER Working Paper*, no. 5398.

Solow, R 1956, 'A Contribution to the Theory of Economic Growth', *Quarterly Journal of Economics,* vol. 70, no. 1.

Swan, T 1956, 'Economic Growth and Capital Accumulation', *Economic Record*, 32.

Tunny, G 2006, 'Innovation across the OECD: a review of recent studies', *Economic Round Up*, Treasury, Summer.

Withers, G 2007, 'Can distance be defeated', in *Competing from Australia*, Growth No. 58, CEDA, Melbourne.

Young, A, Wilkie, J, Ewing, R, and Rahman, J 2008, 'International comparisons of industry productivity', *Economic Roundup*, this volume.

The resources boom and the two-speed economy

Phil Garton[1]

The resources boom has prompted much discussion of Australia having become a two-speed economy. There are concerns that the gains from the boom accrue largely to mining-related sectors and the states where these are concentrated, while the rest of the country is being hit by higher interest and exchange rates as a result of the boom.

This article shows that there has been a divergence in output and employment growth between the mining states and the rest of the country in recent years. Less well recognised is that this is not a new phenomenon. Although recent growth differences have been larger than average, the mining states have generally grown faster than the rest for some time, mainly reflecting faster population growth.

Nor does the evidence support the contention that the non-mining states have largely missed out on the benefits of the boom. Recent growth in employment and real household disposable incomes in these states has been well above average. This suggests that income gains from the boom have been more widely distributed and that it has provided a stimulus to labour demand generally.

---

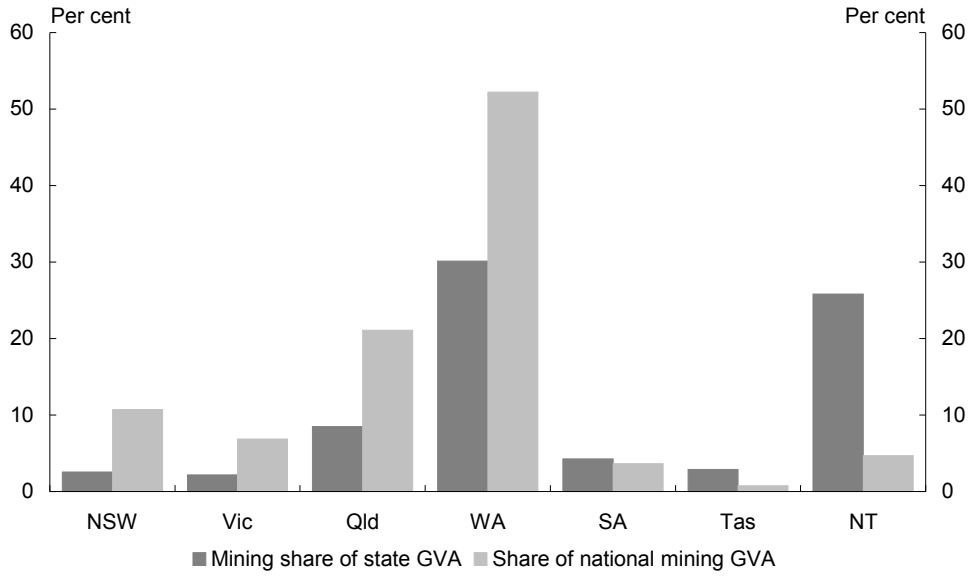
1 The author is from Domestic Economy Division, the Australian Treasury. This article has benefited from comments and suggestions provided by David Gruen. The views in this article are those of the author and not necessarily those of the Australian Treasury.

Introduction

Strong rises in non-rural commodity prices have seen Australia's terms of trade rise by almost 50 per cent since early 2004. These price rises have profound effects on the economy as they constitute both a large shift in relative prices — which induces resource movements between sectors — and a large increase in real incomes — which boosts aggregate demand.

There is a major geographic dimension to these impacts, as mining activity is a relatively larger proportion of the economies of Western Australia, the Northern Territory and Queensland (Chart 1). The boost to activity from the terms of trade is therefore stronger in these 'mining states' than in the rest of Australia.[2] To put this into national perspective, the mining states accounted for one-third of the national GDP in 2006-07, of which Queensland contributed 19 per cent and Western Australia 13 per cent. The remaining two-thirds of the economy is dominated by New South Wales (32 per cent) and Victoria (24 per cent).

Chart 1: Mining shares of gross value added at basic prices, 2006-07[(a)]



(a) Gross value added at basic prices excludes taxes less subsidies on products, which are not apportioned by industry.
Source: ABS cat. no. 5220.0.

The stimulus from the resources boom means that mining states will tend to grow faster than the non-mining states while the mining industry is expanding. Further, faster expansion of mining-related sectors and regions will attract labour and capital

2 For simplicity, this article uses the term 'states' to include the territories.

away from the rest of the economy. In a fully-employed economy, this may imply slower growth in non-mining sectors and regions (Henry 2006). In the presence of capacity constraints, the stimulus to demand from rises in the terms of trade adds to inflationary pressures, requiring some offsetting mechanism to moderate demand growth. Under the macroeconomic policy framework in operation in Australia this largely occurs through higher interest rates and a higher exchange rate.

This phenomenon of differences in state economic performance as a result of the resources boom has been characterised as a 'two-speed economy'. The purpose of this article is to examine the evidence with respect to three key questions.

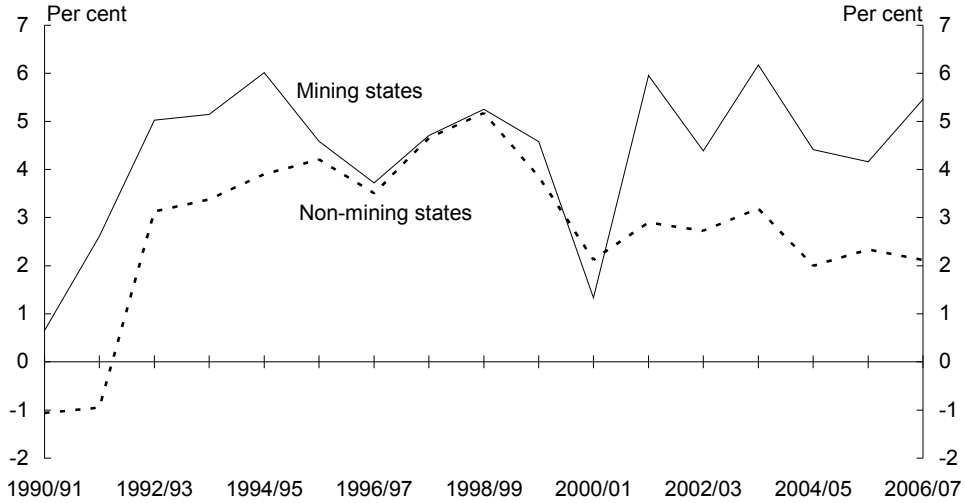
- Has the recent resources boom been associated with widening differences in economic performance between the states?
- Has recent economic performance in the non-mining states weakened in absolute terms?
- How have differences in economic performance translated into differences in average income growth between states?

Have recent differences in state economic performance been unusually large?

Much of the recent commentary on the two-speed economy assumes that recent differences in state economic performance have been unusually large. Chart 2 shows that while output growth in the mining states has been faster than in the non-mining states since the resources boom commenced in early 2004, such gaps are not unusual.[3] Apart from the period 1996-97 to 2000-01, the mining states have grown significantly faster than the rest since 1989-90 (the period for which data are available). Nor has recent output growth in the mining states been unusually fast in absolute terms.

3 Mining and non-mining state growth data presented in this article are weighted averages, which reflect the relative economic size of each state. Mining states are Queensland, Western Australia and the Northern Territory.

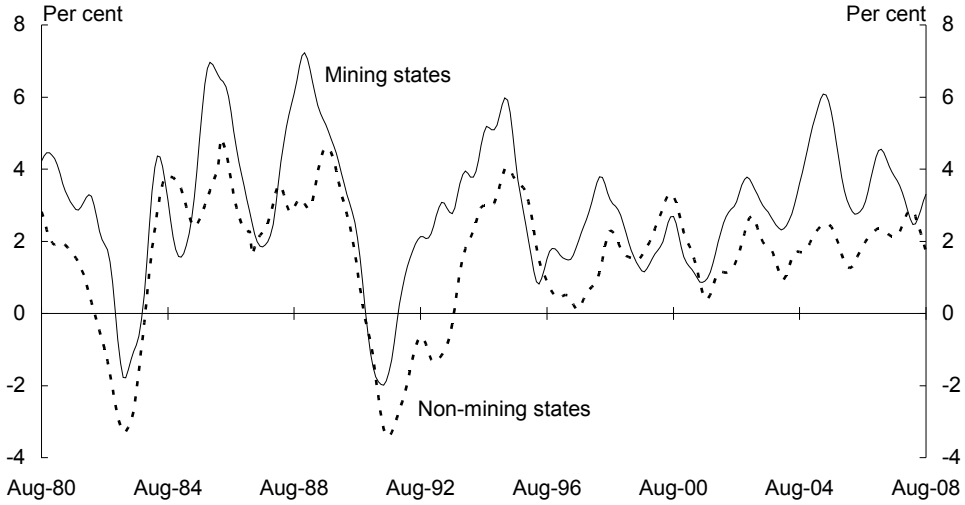
Chart 2: Gross state product growth



Source: ABS cat. no. 5220.0.

A comparison of employment growth, which is available over a longer time period, also indicates that faster growth in the mining states has been the norm (Chart 3). There was a large gap in employment growth in the initial stages of the current resources boom, although gaps of this size have also been seen on a number of previous occasions.

Chart 3: Employment growth (trend, through the year)

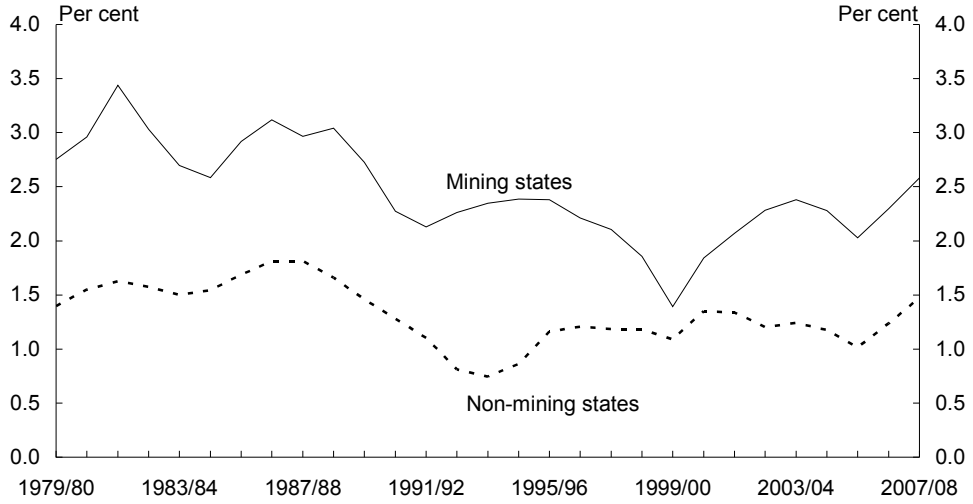


Source: ABS cat. no. 6202.0.

These data suggest that the two-speed economy is not a new phenomenon. Chart 4 shows that these long-running differences between mining and non-mining state growth can be attributed largely to faster population growth in the mining states.

The resources boom does not appear to have had any noticeable effect on relative population growth: in fact, recent differences have been smaller than those seen up to the mid-1990s.

Chart 4: Growth of civilian population aged 15 and over



Source: ABS cat. no. 6202.0.

How has the resources boom affected output and employment growth in mining and non-mining states?

If differences in state growth performance are not a new phenomenon, have they been widened by the resources boom? To help answer this question, Table 1 compares average growth rates for key economic variables over the period since 2003-04 with those over the period 1990-91 to 2003-04. The earlier period provides a reasonable benchmark for normal performance as both mining and non-mining states had employment to population ratios in 2003-04 that were close to those in 1989-90. This means that average performance is not affected by differences in capacity utilisation between the start and end of the period.

Table 1: Mining and non-mining state output and employment growth

	Average growth 1990-91 to 2003-04 (per cent)	Average growth since 2003-04(a) (per cent)	Difference between periods (per cent)
Mining states			
Gross state product	4.3	4.7	0.4
Population	1.9	2.2	0.2
GSP per head	2.3	2.5	0.2
Employment	2.2	3.9	1.7
State final demand	4.1	7.3	3.1
Non-mining states			
Gross state product	2.9	2.2	-0.7
Population	0.9	1.0	0.1
GSP per head	2.0	1.1	-0.9
Employment	1.2	2.1	0.9
State final demand	3.2	3.1	-0.1
Mining/non-mining state gap			
Gross state product	1.4	2.5	1.1
Population	1.0	1.1	0.1
GSP per head	0.4	1.4	1.0
Employment	1.0	1.8	0.8
State final demand	0.9	4.2	3.3

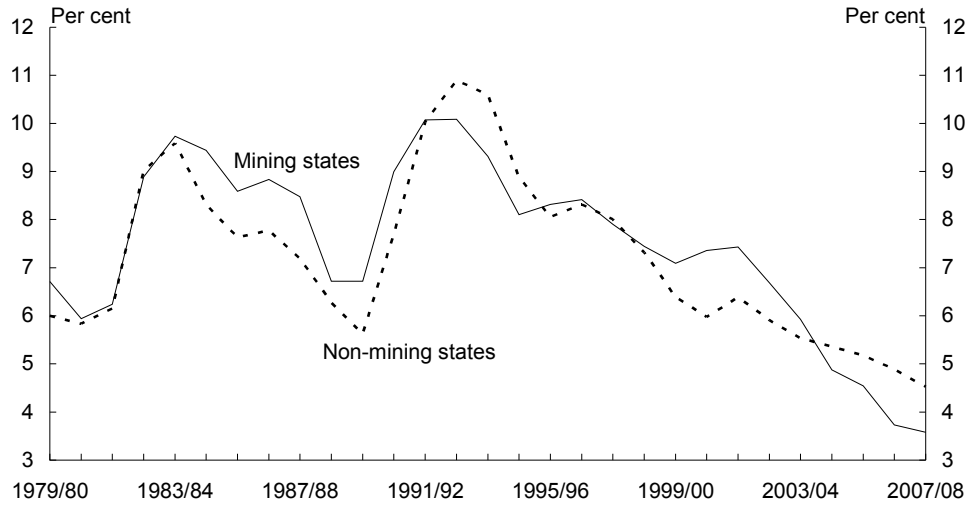
(a) Averages to 2007-08 for employment and to 2006-07 for other variables.
Sources: ABS cat. nos. 5202.0 and 6202.0.

Before the resources boom, average annual GSP growth in the mining states was around 1½ percentage points faster than in the rest of Australia, while average employment growth was 1 percentage point faster. These differences largely reflect population growth being about 1 percentage point higher in the mining states. On a per head basis, GSP growth was less than ½ of a percentage point faster in the mining states than elsewhere.

As we would expect, the resources boom has provided a greater stimulus to activity in the mining states than elsewhere. Since 2003-04, the average gaps between mining and non-mining states' growth in output and employment have been around 1 percentage point wider than previously. GSP and employment have grown about twice as fast in the mining states as in the non-mining states over this period.

An important consequence of this stronger employment growth has been to reverse the experience of the previous quarter-century in which mining states generally had higher rates of unemployment than the rest of Australia (Chart 5). The unemployment rate in the mining states has fallen to around 1 percentage point below the unemployment rate in the rest of Australia.

Chart 5: Unemployment rates



Source: ABS cat. no. 6202.0.

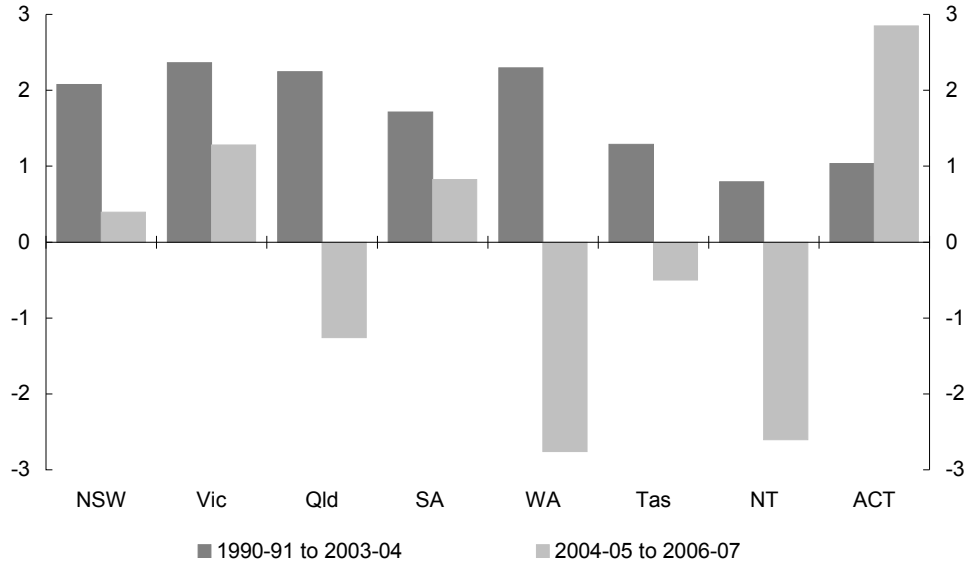
Another notable development shown in Table 1 is that final demand growth in the mining states in the recent period has increased far more than output growth. In other words, most of the increase in demand growth from these states has been met from interstate or overseas production. One reason for this is that capital goods used in the mining industry, whose investment has been a key driver of increased demand growth, are largely produced elsewhere. In addition, with unemployment falling to very low rates, capacity to meet increased demand from local production has been constrained.

Has recent economic performance in the non-mining states slowed in absolute terms? Table 1 shows that recent GSP growth in the non-mining states has been about ¾ of a percentage point slower than previously, while final demand has grown at around its previous average rate. Notwithstanding this, recent labour market performance in the non-mining states has been stronger than previously. Employment growth in the non-mining states has been almost 1 percentage point faster than the previous average. This has been associated with a fall in the unemployment rate in these states of around 1 percentage point since 2003-04 (Chart 5).

This raises the question of why employment growth in the non-mining states has been so strong when GSP growth has moderated, implying that the second-round effects of strong mining-related activity and incomes on demand for goods and services produced in the non-mining states have been more than offset by other factors. These other factors would include higher interest and exchange rates and the post-2003 housing market correction, which particularly affected New South Wales.

A possible explanation may be found in the general slowing in producer real wage growth in the non-mining states since 2003-04 (Chart 6).[4] This observation appears consistent with the Stolper-Samuelson theorem, which suggests that rising resources prices will put general downward pressure on producer real wages when the economy is at full employment.[5] If wages grow more slowly relative to output prices, employers have an incentive to employ labour more intensively than otherwise, so that labour demand grows more strongly than output.

Chart 6: Annual growth in producer real wages (period average)[(a)]



(a) Producer real wage is calculated as the ratio of average weekly ordinary-time earnings for full-time adults to the implicit GSP price deflator.
Source: ABS cat. nos. 5220.0 and 6302.0 and author's calculation.

This suggests that the resources boom has benefited workers in non-mining states by boosting demand for labour across the country, reducing unemployment rates more quickly than would have occurred otherwise. However, this absorption of unemployed labour means that these high rates of employment growth are unlikely to be sustainable into the future. Unless growth in labour supply can be boosted, any future divergence between employment growth in the mining and non-mining states is more likely to be associated with below-trend growth in the latter.

---

4 The producer real wage is the nominal wage deflated by output prices, whereas the standard consumer real wage measure is the nominal wage deflated by consumer prices. Rises in export prices cause output prices to grow faster than consumer prices. As a result, producer real wages fall relative to consumer real wages. Hence, a fall in producer real wages need not imply a fall in consumer real wages.

5 See Henry 2006 for a more detailed explanation.

How has the resources boom affected income growth in mining and non-mining states?

Comparisons of output growth may not provide a good indication of the effects of the resources boom on living standards, as rises in the terms of trade cause incomes to grow faster than output. Table 2 shows that the gap between mining and non-mining states in real gross domestic income (GDI) growth in recent years has been much wider than the gap in output growth. GDI is total income derived from economic activity located within a state, which captures the effects of output price changes on incomes.

Table 2: Mining and non-mining state income growth and inflation

	Average growth 1990-91 to 2003-04 (per cent)	Average growth since 2003-04(a) (per cent)	Difference between periods (per cent)
Mining states			
Real gross domestic income per head	2.4	6.1	3.7
Real household disposable income per head	1.4	3.2	1.8
CPI	2.6	3.5	0.9
Non-mining states			
Real gross domestic income per head	2.9	2.0	-1.0
Real household disposable income per head	1.0	2.4	1.4
CPI	2.6	2.8	0.2
Mining/non-mining state gap			
Real gross domestic income per head	-0.6	4.1	4.7
Real household disposable income per head	0.4	0.7	0.3
CPI	-0.1	0.7	0.7

(a) Averages to 2007-08 for CPI inflation and to 2006-07 for other variables.
Sources: ABS cat. nos. 5202.0 and 6302.0 and author's calculation.

This does not imply that higher income growth has gone only to mining state residents. GDI does not distinguish income recipients according to residency. Growth in real household disposable incomes provides a better indication of the extent to which income gains have gone to mining state residents. On this measure, the gap between growth in household incomes in mining and non-mining states has widened only slightly in the recent period. Further, households in the non-mining states have also enjoyed significantly faster growth in real disposable incomes than in the past.

This suggests that the income gains from the resources boom have been spread much more widely than the states in which mining is concentrated. Further, average gains to households in the mining states have not been exceptionally large. There are a number of reasons for this.

First, a substantial share of the increased mining company profits reflected in GDI growth has accrued to foreign shareholders. A comparison of increases in GDI — income derived from economic activity within Australia — and gross national income

(GNI) — income accruing to Australian residents — suggests that around 30 per cent of the income gains from the terms of trade rise over the past four years may have gone to foreign residents.[6]

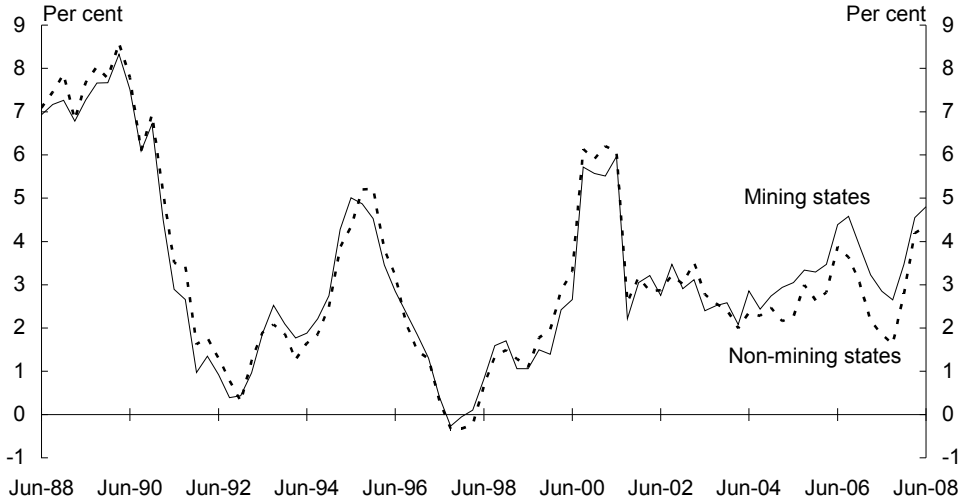
Second, Australian shareholdings in mining companies — including indirect holdings through superannuation and other investment funds — are spread across the states. As the non-mining states account for nearly 70 per cent of the Australian population, most of the increased profits accruing to Australian shareholders are likely to have gone to residents of these states.

Third, a substantial proportion of increased mining-related incomes has accrued to the Commonwealth Government through increased company income and other tax revenues. Treasury estimates that around one-third of the additional national income attributable to the resources boom has gone to Commonwealth tax revenues (Commonwealth of Australia 2008). These increased revenues have financed personal income tax reductions and increases in government benefits to households.

Finally, the resources boom has seen an unusually large divergence between state inflation rates (Chart 7). Inflation in the mining states has averaged around ¾ of a percentage point higher than elsewhere since 2003-04, although the gap has narrowed more recently as inflation has picked up in the non-mining states. Inflation has been higher in the mining states because these have been the regions where demand growth has been strongest and pressures on capacity have been greatest. This higher inflation has offset around ⅓ of the additional income growth that would otherwise have accrued to mining state residents.

6 This calculation assumes that GDI and GNI would have grown in line with GDP in the counterfactual. The total income gain is the difference between actual and counterfactual growth in GDI over the past four years. The income gain to Australian residents is the difference between actual and counterfactual growth in GNI. The estimated income gain to foreign residents is the difference between these two estimates.

Chart 7: Headline Consumer Price Index inflation (through the year)[(a)]

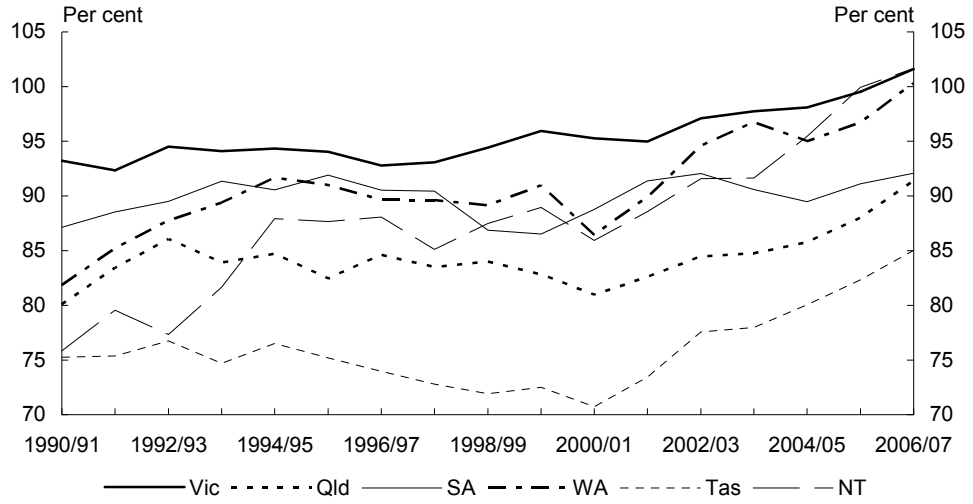


(a) Price indexes constructed using current capital city CPI weights.
Source: ABS cat. no. 6401.0.

It is also useful to consider relative state household income levels. Chart 8 shows that residents of the key non-mining states, New South Wales and Victoria, have until recently had higher average incomes than the rest of the country (excepting the Australian Capital Territory).[7] Income levels in Western Australia and the Northern Territory have recently caught up with those in New South Wales and Victoria. However, the convergence of income levels in other states toward New South Wales levels has been a long-running trend. The resources boom does not appear to have had much impact on this trend.

7 This comparison is based on nominal income levels. Comparison of real income levels is not feasible because consumer price data by state are only available in index terms. Deflating nominal incomes using price indices allows us to compare real income growth between states, but not real income levels. Given the higher inflation rates in mining states since 2003-04, relative real incomes in these states in recent years will have grown less than relative nominal incomes.

Chart 8: Household disposable income per head (proportion of NSW level)



Source: ABS cat. no. 5202.0.

Conclusions

Many of the concerns expressed about Australia having become a two-speed economy are premised on the view that differences in state economic performance during the resources boom have been unusually large and that the gains arising from growth in mining-related activity and incomes are narrowly concentrated.

In fact, Australia has long been a two-speed economy as a result of higher population growth in the mining states. Differences in state employment and output growth have been larger than average in recent years, but by no means exceptional.

While recent output growth in the non-mining states has been slower than average, growth in employment and real household disposable incomes has been significantly faster. This suggests that the benefits of the resources boom have spread well beyond the sectors and regions most closely linked with the mining sector.

Average real income gains to mining state residents appear to have been only moderately greater than those accruing to residents of other states. Much of the surge in mining-related incomes has been distributed elsewhere through mining company shareholdings and increased Commonwealth tax revenues. Mining state residents' income gains have been also been eroded by relatively higher inflation.

References

Commonwealth of Australia 2008, Budget Paper No. 1, *Budget Strategy and Outlook 2008-09*.

Henry, K 2006, 'The Fiscal and Economic Outlook', address to the Australian Business Economists, 16 May.

The Commission on Growth and Development and its implications for development in the Pacific

Robert Christie[1]

Earlier this year the final report of the Commission on Growth and Development was released. Following their analysis of 13 high-growth economies, the Commission confirmed the centrality of economic growth as the means to achieve poverty reduction.

There was no 'magic bullet' to achieving high growth, but high growth economies were connected by a strong commitment to economic openness and policy flexibility. They had active governments with strong leadership committed to growth, and invested heavily in infrastructure, education and health. Many also had interventionist industrial policies, but were careful for these to correspond with their comparative advantage. This article highlights how the Commission's work is useful for policy makers in the Pacific, with relevant recommendations on the importance of government institutions, public and private investment, and global and regional integration.

The Commission's finding that growth paths were country-specific is an important one for policy-makers. As such, the report moves the development debate away from one which prescribes a generic path to growth to one which requires a better understanding of individual developing economies.

---

1 Robert Christie is currently Adviser to Australia's World Bank Executive Director and was formerly Director, Research in AusAID and Adviser to the former Minister for Foreign Affairs on Pacific issues. This article has benefited from comments and suggestions provided by Jane Lake, John Davidson, James Gilling and Stephen Howes. The views in this article are those of the author and not necessarily those of the Australian Treasury.

Introduction

Sustained growth is the most effective means of reducing poverty. In the last 30 years, absolute poverty — the number of people on less than US$1.25 a day at 2005 prices — has fallen substantially. This is almost entirely due to sustained growth. Economies that grow around 3 per cent take a very long time to catch up with developed economies. However, economies that grow around 7 per cent move up in one or two generations.

Finding the 'recipe' for strong economic growth and raising living standards is controversial enough in developed economies. It is even more problematic in developing economies where formal legal, financial, and government institutions are weak; education and health services are low, at best; infrastructure is often non-existent; and, resources are misallocated. History and culture are also important influences.

After the 1990s, policy-makers, the World Bank, and donors began to appreciate the scale of the growth challenge. Technical solutions, such as the so-called 'Washington Consensus' was seen to take too narrow a view of development. In 2005, the World Bank found that some countries that followed the Consensus' prescriptions exceeded forecasts, while others fell well short (World Bank 2005). On the other hand, while the Consensus called for a scaling back of the role for government, many high-growth economies had quite interventionist governments.

The Commission on Growth and Development or the 'Growth Commission' was established to examine those economies that did achieve high growth, in an attempt to draw out lessons for lower growth economies.[2] It closely examined 13 cases of sustained high growth — those economies that had achieved seven per cent or more for 25 years or more. As can be seen from the list of the 'Growth 13' countries in Table 1, while the familiar Asian economies dominate the list, every other region of the developing world is represented, with economies from a spectrum of natural resource endowments and population size.

2 Established in April 2006, the Commission released its final report on 21 May 2008. Chaired by Nobel Laureate Michael Spence, it included fellow Nobel Laureate and growth expert Robert Solow, as well as 19 political and business leaders from developing and developed countries. There were five meetings of the full Commission, 11 workshops, 50 thematic papers and 25 country case studies. Led by the World Bank, it was funded by several donors, including Australia.

Table 1: 13 Success stories of sustained high growth

Country	High growth period	Per capita income at:	
		the beginning of the high growth period	2005
Botswana	1960–2005	210	3,800
Brazil	1950–1980	960	4,000
China	1961–2005	105	1,400
Hong Kong, China	1960–1997	3,100	29,900
Indonesia	1966–1997	200	900
Japan	1950–1983	3,500	39,600
Korea, Republic of	1960–2001	1,100	13,200
Malaysia	1967–1997	790	4,400
Malta	1963–1994	1,100	9,600
Oman	1960–1999	950	9,000
Singapore	1967–2002	2,200	25,400
Taiwan (China)	1965–2002	1,500	16,400
Thailand	1960–1997	330	2,400

From its study of the high growth economies, the Commission observed common factors, and from that sought to draw out some policy conclusions. While it identified what it saw as key ingredients, the Commission characterised these as contributing to country-specific recipes, rather than a one size fits all approach.

Box 1: Growth and poverty reduction

The focus of the Commission's report is on the factors that contributed to high growth. While the Commission provides evidence of the well-recognised link of growth to poverty alleviation, the connection between growth and poverty alleviation does not feature prominently in the report. The report does, however, recognise an important role for government in an economy's growth path. The Commission highlights the centrality of education and health for high growth, as well as inclusive social safety nets to maintain support for high growth. Therefore, in a high growth economy, not only does growth reduce poverty, but a government focused on high growth will provide services that, at the same time, also improve the lives of the poor.

The following sections summarise the findings of the Commission and distil some of the more relevant parts of the report for development in our region. We then consider the broader implications of the Commission's work as part of a new, more diagnostic approach to national development strategies.

Common elements to high growth economies

Achieving sustained high economic growth is possible, but it is not easy. Only 13 economies have achieved it. The Commission found that there is no 'magic bullet' to achieving growth: 'orthodoxies only apply so far'. In fact, the Commission found that

the necessary and sufficient conditions for growth are simply not known with a significant degree of conviction.

There were, however, five common elements to those economies that did achieve sustained high growth: 1) they fully exploited the world economy; 2) they maintained macroeconomic stability; 3) they mustered high rates of saving and investment; 4) they let markets allocate resources; and 5) they had committed, credible, and capable governments.

Outward-focus

All of the 13 economies made the most of the global economy. They used foreign direct investment and foreign education to achieve 'catch-up growth' by importing ideas, technologies and know-how: it is easier to learn something than invent it. These economies also specialised in products and exported them to the deep, elastic world markets. In short, the economies imported what the rest of the world knew and exported what it wanted.

Macroeconomic stability

While many of the 13 economies did experience macroeconomic volatility and even moderately high inflation, they avoided the worst of this turbulence. Many of the countries studied also ran budget deficits for extended periods and even high ratios of debt to GDP. But public debt did not get out of hand, primarily due to the economy growing faster than the increase in liabilities. Bouts of inflation, sometimes persistent and relatively high at around 15-30 per cent, were stable enough not to scramble market signals or deter savers. The benefits of bringing inflation to very low levels in a fast growing developing economy were 'unclear' to the Commission.

High savings and investment rates

A national savings rate of 20-25 per cent or higher was not unusual in the successful economies. The Commission found that while countries could rely more on foreign capital to finance their investment needs in principle, in reality capital inflows had a mixed record. They believed that foreign savings were an imperfect substitute for domestic saving, including public saving, to finance the investment that a booming economy requires.

Role of markets

The high growth economies all relied on a functioning market system. The economies studied had governments committed to growth and liberalised product markets, including the labour market. But they were not free-market purists. Many economies

had quite interventionist governments, which provided tax incentives and subsidised credit. The Commission observed that their significance was hard to prove, but the interventions probably helped them to discover their comparative advantages. Importantly the policies did not defy comparative advantage, something that the many failed industrial policy interventions elsewhere generally attempted.

Committed, credible, and capable governments

The Commission found strong, capable leadership of effective governments to be vital. As the economy grows and develops, active, pragmatic governments have crucial roles to play. In the high-growth Asian economies, it was accepted that governments played a more complex role, despite inevitably making some mistakes along the way. But what size the state should be remains unanswered. The Commission preferred to leave it to Sir Arthur Lewis who noted that 'Governments may fail either because they do too little, or because they do too much' (Growth Commission 2008a, p 30).

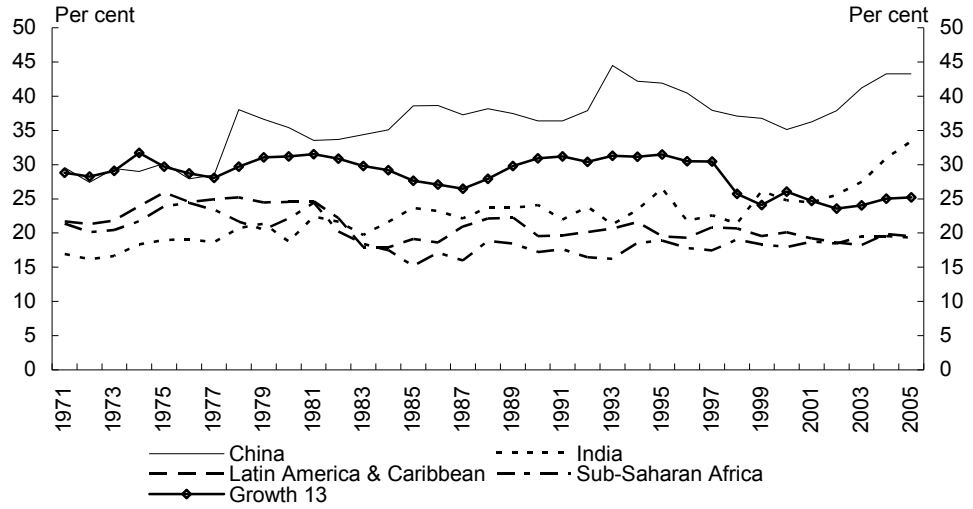
Policy ingredients of growth strategies

To sustain growth over time, a set of conditions and policies need to come together. The Commission had a keen sense of the policies that 'probably matter.' But they avoided prescribing a list of sufficient conditions for growth. The Commission was nonetheless confident that the policies discussed below will make a difference to a countries chance of sustaining high growth. They can be grouped together into five broad areas: accumulation; innovation; allocation; stabilisation; and inclusion.

Accumulation and innovation

Economies need to accumulate the infrastructure and skills required for high growth. The Commission noted a big role for infrastructure in high growth economies. These economies had investment rates of at least 25 percent of GDP, with fast-growing Asia investing 5-7 per cent of GDP into public projects (Chart 1). The Commission found infrastructure spending in low-growth countries, on the other hand, to be badly neglected. Many developing countries invest only around two percent of GDP on public infrastructure, often less. The Commission was concerned that infrastructure spending was often crowded out by short-term, political priorities over longer-term needs. They appealed to governments not to divert the revenue of infrastructure-related state-owned enterprises away from investment.

Chart 1: Investment rates as a proportion of GDP for 'Growth 13' countries 1971-2005



Source: Growth Commission (2008a).

Investments in people were also important. Healthy, well-educated workforces allow economies to import knowledge, use and adapt it. The Commission observed that high growth economies put substantial public investment — at least 7-8 per cent of GDP — into their people. Foreign direct investment also played an important part in economies absorbing knowledge, technology and innovative approaches from the rest of the world.

Allocation and stabilisation

The Commission highlighted the importance of regulatory renewal in a fast growing economy: 'one of the most common mistakes … is to find a successful constellation of policies and industries, then stay with them … [W]hen it comes to growth very little is permanent' (Growth Commission 2008a, p 44). To promote growth, governments should facilitate the entry and exit of firms and labour mobility albeit not at the expense of safeguards for unsafe working conditions. Governments should protect people, not job positions through social safety nets to cushion the 'blows of the market' (ibid, p 44).

The Commission found that none of the high-growth economies were particularly quick to open their capital accounts, with policies that discouraged speculative capital flows proving useful in turbulent times. While the views on the value of manipulated exchange rates varied within the Commission, it was agreed that they could outlive their usefulness, particularly if pursued to extremes.

Inclusion

The Commission pointed out that the virtue of sustained growth is sometimes missed because people confuse rising inequality with a failure to make progress against poverty. In the early stages of growth, incomes of the rich increase faster than the poor, and income gaps therefore tend to widen. But at the same time, it is possible — and quite normal — for poverty to fall even as inequality rises. Serendipitously, in growing economies income can be redistributed without anyone's living standard falling, making the politics of redistribution that much easier. Redistributing some of the benefits of growth also maintains the consensus about the importance of growth. Governments should therefore seek to contain inequality — at both ends of the income spectrum — through social safety nets and access to basic services.

Growth and development in the Pacific region

The broad suite of key messages in the report represents more of a set of guiding principles than a strict handbook. The report stresses that a coherent and successful growth strategy should be 'country- and context-specific'. But if growth is to be sustained in our region, policy makers also need to learn from others who have achieved high growth.

While the Pacific economies cannot be characterised as a homogenous group (see Table 2, below), with significant differences in population and income, over the last two decades no country has come close to achieving consistent growth rates of over 7 per cent.

The recent Pacific 2020 regional initiative examined the challenges of growth in the Pacific. The Commission's report had significant parallels with the work of the Pacific 2020 report. These can be summarised into three key areas: institutions, investment, and integration. As in Pacific 2020, the Commission highlighted an important role for effective government institutions and implementation, and strong leadership in achieving high growth. Commission Chair Michael Spence noted that one of the biggest surprises was how important political leadership was to growth (Foreign Policy 2008). The Commission also echoed Pacific 2020's call for a focus on public and private investment, although the Commission also called for the careful consideration of a more interventionist industrial policy. Just whether interventionist policies suit the Pacific with its various constraints requires further, careful examination. Lastly, the Commission highlighted some of the benefits of regional and global integration. Below we examine these three areas in more detail.

Table 2: Key statistics for the Pacific

Country	Population ('000)	Income ($USm)	Real GDP growth (1990-2004)	Government Effectiveness
Melanesia				
Fiji	840	3,098	2.6	35.5
Papua New Guinea	5,800	695	3.6	25.1
Solomon Islands	521	513	0.8	20.4
Vanuatu	213	1,472	2.7	45.5
Polynesia				
Cook Islands	20	7,549(b)	2.5(d)	44.1
Niue	1.8(a)	4,364(c)		50.7
Samoa	181	2 030	2.4	49.3
Tonga	102	2 087	2.6	32.2
Tuvalu	11	1,346(c)	4.3(e)	40.8
Micronesia				
Kiribati	90	633	4.2	34.1
Marshall Islands, Rep.	61	1,803	-0.5	18.5
Micronesia, Fed. States	108	1,786	1.3	38.4
Nauru	10(a)	3,500(c)	-4.4	35.1
Palau	21	6,350	-0.8	36.5

'Government Effectiveness' is a World Bank measure which considers the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. The number represents the countries percentile rank, where 100 is the highest and 0 is the lowest. The measures are drawn from a diverse variety of survey institutes, think tanks, non-governmental organizations, and international organizations over the period 1996-2007.
(a) In 2001.
(b) In 2003.
(c) In 2002.
(d) In 1990-2003.
(e) In 1990-2002.
(f) Not available, N/A – not applicable.
Source: Columns 1-4: Commonwealth of Australia (2006), Column 5: World Bank (2008).

Institutions and leadership matters

The Commission's insight that 'markets and institutions co-evolve' is a simple but important one. Institutions in developing countries often started life well ahead of markets during the early independence years. After this, their level of service delivery has tended to fall back in line with the undeveloped level of the markets in these economies. Even if we knew how to engineer institutions, moving them back to their original state will not lead to automatic prosperity.

Rather, these institutions need to evolve as the economy expands. The Commission saw benefits in incremental rather than rapid policy reform. Policy shifts and reforms are hard to predict accurately in a developing economy, especially when the resilience of economic institutions and the capacity of government is problematic. The Commission therefore endorsed Deng Xiaoping's maxim of the need to 'cross the river by feeling for the stones'.

The Commission's report repeatedly highlighted the importance of strong leadership. In successful high-growth economies, policy makers understood that growth did not just happen, but rather it was consciously chosen as an overarching goal. Such leadership requires patience, a vision with a long planning horizon, and a relentless focus on the goal of inclusive growth. One of the messages for the Pacific is that a broad consensus about the need to achieve high, sustainable growth is essential, with a consistent focus on it even as governments change.

Leadership is also required within the bureaucracy. Many high-growth economies had governments with increasingly capable technocratic teams, several having dedicated and influential reform teams. In order to build this capacity, the Commission endorsed the concept of international exchanges for civil servants. The Regional Assistance Mission to the Solomon Islands (RAMSI), amongst others, involves government personnel from Australia visiting the Solomon Islands and to a lesser extent, vice versa. The Commission considered that there is merit in extending such programs to exchanges between developing country bureaucracies.

Investment

The Commission emphasised the importance of both public and private investment. As noted, the Commission stressed the need for much greater levels of investment in infrastructure, education and health services than is currently found in low-growth economies such as those in the Pacific. Investment in these areas was seen as an essential building block of growth.

The Commission had recommendations on both regulations that might impede investment, and also more pro-active policies that might spur investment. Sensible regulations covering private sector investment and labour had a direct impact on private sector investment. Labour markets in many developing countries are plagued by regulations that essentially create rents for insiders and exclude outsiders. But removing these regulations is politically difficult — these laws are often cloaked in nationalistic rhetoric. So a more feasible strategy is to create an alternative employment track which allows lower wages for a certain period in the rapidly growing sections of the economy until productivity catches up.

The Commission's report also had some more controversial recommendations for encouraging investment, based on the more interventionist policies found in many high-growth countries. The Commission found that well-managed interventionist industrial policies such as time-limited taxation breaks and directed credit can be effective. The list of risks and caveats about such policies however is long, derived from the failure of industrial policies in many developing countries. The report highlighted the need to align them with an economy's comparative advantage, use them temporarily, critically evaluate them, and avoid the (often strong) temptation to

pick winners. The report's warning about the often dominant influence of a single foreign investor in small states is pertinent here. Given this list of caveats, we make no recommendations about the benefits of these policies to the Pacific here, but rather suggest they require further, careful consideration.

Integration

The importance of economic integration, both within the global economy but also within the region, is the third area in the Commission's final report that has important relevance for the Pacific.

The Commission included a section on the particular challenges facing small states. They noted the importance of small states embracing the global economy, with a strong openness policy. However, as the report pointed out, to pursue growth, small states have little choice but to turn outwards. This is why they tend to already have a higher trade to GDP ratio than for other country groups.

On the idea of greater regional integration, the Commission discussed both regional pooling of services, and greater links with developed countries. In other regions the pooling of regional services goes beyond what is currently found in the Pacific. For example, the Central and West African region relies on multi-country central banking. The Eastern Caribbean has a single Supreme Court, a superior court of record with nine members. As well as pooling its services, the Eastern Carribean outsource the role of the final appellate court to the Privy Council in London. Here, states sacrifice some political sovereignty for better quality of service. While the rules governing these services are often difficult to agree and require continued commitment by all states, the consensus for many regional experiments is on balance a positive one.

Pro-active trade policies to help developing countries might also be part of greater regional integration. The report suggested that developed countries grant time-bound trade preferences to manufactured exports. Somewhat surprisingly, the Commission concluded that the costs would be minimal, even if they were not successful. The need to ensure that such policies align with developing countries' comparative advantages applies here.

The Commission noted that the per capita cost of government is much higher in micro states than was the case under their former colonial powers. An example was banking supervision, which costs a similar amount for a country of 400,000 as 4 million. The Commission suggested a self-governing structure for Pacific microstates in association with Australia or New Zealand. This was one of the few direct recommendations made in the report.

The report had surprisingly little to say on labour mobility or the importance of remittances to Pacific countries, an important part of regional integration around the world.

A new approach to growth and development strategies?

According to Harvard's Dani Rodrik, the Commission marked an important shift in growth strategies, from a presumptive approach to a more diagnostic one (Rodrik 2008). The traditional policy framework has been presumptive, starting with strong preconceptions about the nature of the problem, providing a 'laundry list' of reforms, and emphasising the need to undertake them all immediately, rather than in a sequenced and prioritised manner. The Washington Consensus which so dominated the development paradigm in the 1990s followed this approach through their prescription that governments (essentially) 'stabilise, privatise, liberalise' (Williamson 1990).

By contrast, the policy mindset reflected in the Commission is relatively agnostic about what works, recognising the limits of what we know about the development process. Political considerations, underdeveloped institutions, and unpredictable impacts of policy changes mean the path to high growth is not a linear one. Rather, a growing economy is a moving target. As Chairman Michael Spence said, 'no one set of policies will work in all circumstances. An effective strategy ... is context specific, country specific, time specific' (Financial Times).

Thus, the Commission represents a more diagnostic approach to growth and development. While they identify the key insights and policy levers that help countries raise and sustain the pace of growth and poverty reduction, countries themselves need to find local solutions to the most significant economic bottlenecks or 'binding constraints', and identify a relatively manageable number of reforms that give the highest payoff. This will often be a messy process, requiring much 'second-best reasoning', experimentation, and learning (Rodrik 2008).

Conclusion

Following the release of the Commission's final report, Commission Chair Michael Spence said that the real secret of economic development is that there are no secrets. The Commission's Vice-Chair Danny Leipziger agreed, noting that the World Bank is 'acutely aware that there are no silver-bullets to create long running, inclusive growth, and that no single paradigm exists' (Growth Commission 2008b).

For donors, this means they need to be less certain of advice given and more aware of controversy even when it seems that the solutions are obvious. Some, such as

well-known aid critic Bill Easterly have criticised these conclusions, generalising the Commission's work as 'we do not know, but trust experts to figure it out' (Easterly 2008). To others, the Commission's report was all things to all people, and really just provided a list of policy areas that donors have been working on for some time.

But the diagnostic approach of the Commission's final report led prominent development thinker Dani Rodrik to believe it can be considered a 'watershed for development policy' (Rodrik 2008). Whether the approach will be extended the status of being considered a new paradigm remains to be seen. True, the Commission has gone over some traditional ground such as the importance of macroeconomic stability and the provision of public goods. But rather than Easterly's assertion that the Commission leaves us with nothing, it actually centres on some very important and broad development challenges for policy makers and donors that need answering.

The Commission's view on the importance of strong leadership in high-growth economies opens up important questions about what creates and sustains good leadership. It raises issues about leadership styles and the role of culture in leadership. The need to better understand how institutions evolve rather than trying to restore them to previous levels raises the question of just how institutions evolve.

The issues raised by the Commission also make us question whether the importance of the role of growth in development has not been underplayed. The fact that the Commission was created in 2006 could be thought of as a surprisingly late edition to the development discussion. The UK's 37 million pound 'International Growth Centre' was announced only this year (DFID 2008).

We can also look in our own region and ask just how deeply the growth challenge in developing economies in the Pacific is understood. This process was given a significant boost by the regional Pacific 2020 study. But the Commission tells us that more probing questions need to be asked at the country-level. What are the binding constraints of economies? How do economies find their comparative advantages and then exploit them once they do? Should some governments focus more on education to export labour or greater infrastructure to encourage tourists? As a first step, a greater, more consistent focus on improving data collection is required.

There may not have been many startling insights in the Growth Commission Report. But being more confident that there is no definitive answer to the development question is more likely to open a true dialogue between developing country policy makers, their citizens, and donors on how growth should be achieved that will ultimately benefit all, especially in our region.

References

Growth Commission 2008a, The Growth Report: strategies for sustained growth and inclusive development, World Bank, Washington.

Growth Commission 2008b, The Growth Report- Press Release: Commission Identifies Policy Ingredients fro Successful Growth. http://www.growthcommission.org/index.php?option=com_content&task=view&id=97&Itemid=189.

Commonwealth of Australia 2006, Pacific 2020: challenges and opportunities for growth, AusAID, Canberra.

Department of International Development 2008, 'UK to fund new centre to tackle growth in developing countries', http://www.dfid.gov.uk/news/files/growth-centre-37m.asp.

Easterly, B 2008, Trust the development experts — all 7 billion, Financial Times, 28 May 2008.

Foreign Policy 2008, 'Seven Questions: How Countries Get Rich', http://www.foreignpolicy.com/story/cms.php?story_id=4322.

Rodrik, D 2008, 'No more laundry lists', The Guardian, 10 July 2008.

World Bank 2005, 'Economic Growth in the 1990s: learning from a decade of reform'.

World Bank 2008, 'Governance Matters 2008: Worldwide Governance Indicators, 1996-2007' http://info.worldbank.org/governance/wgi/index.asp.

Williamson, J 1990, 'What Washington Means by Policy Reform', Latin American Adjustment: How Much Has Happened?, Chapter 2, Institute for International Economics, Edited by John Williamson.

International comparison of industry productivity

Adam Young, Joann Wilkie, Robert Ewing, and Jyoti Rahman[1]

'Productivity isn't everything, but in the long run it is almost everything'. Paul Krugman

The United States has long been considered the world's productivity frontier, maintaining a sizeable aggregate productivity gap with Australia over the past quarter century. This paper finds that Australia's industry structure does not appear to make a major difference to Australia's productivity gap with the US, suggesting that the gap arises mainly from differences in productivity levels within industries. Using new data from the EU Klems project, this paper finds that Australia's productivity level relative to the US differs markedly across industries.

1 The authors are or were from the Macroeconomic Policy Division of the Australian Treasury. This article has benefited from comments and suggestions provided by Bryn Battersby, Ben Dolman, Graeme Davis, Jyothi Gali, Angelia Grant, David Gruen and Tony McDonald and participants at a number of internal Treasury presentations. The views in this article are those of the authors and not necessarily those of the Australian Treasury.

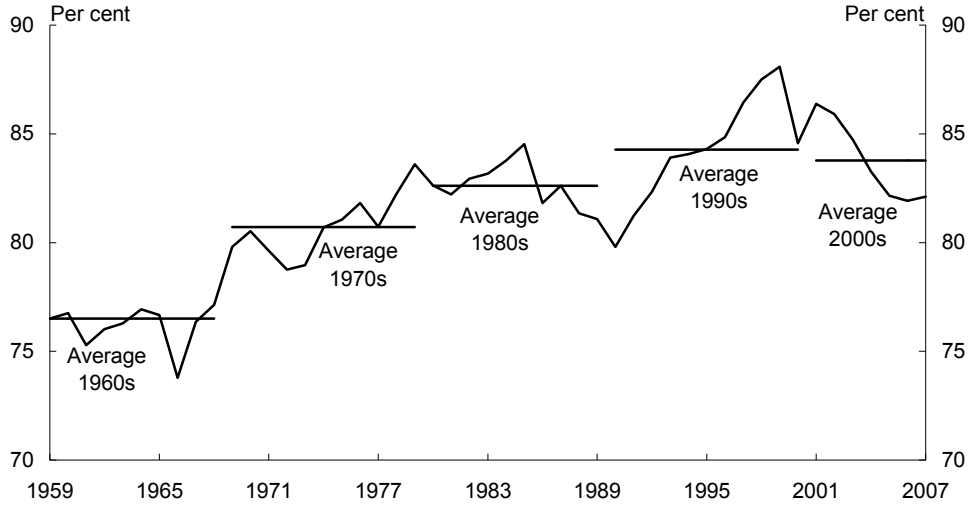
Introduction

Although limited, GDP per capita is a useful measure of countries' standard of living. A higher GDP per capita means more consumption possibilities, on average, for a country's population. Differences in GDP per capita over time and across countries are driven by differences in productivity. As labour productivity grows, higher levels of output are produced for a given level of labour inputs. As Krugman (1991) noted, a country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker. A better understanding of the causes of productivity differences shed light on how much a country's income per person can catch up to richer countries, and the role for economic policy.

The US economy has represented the technological and efficiency frontier at the aggregate level since the early stages of the twentieth century and is often referred to as the productivity frontier. As such, Australia's labour productivity performance — measured as gross value added per hour worked, and referred to synonymously as productivity in this paper — is often analysed relative to US productivity.

Australia's labour productivity has averaged around 84 per cent of US productivity since the early 1990s, rising from an average of around 76 per cent in the 1960s (Chart 1). More recently, Australia's relative productivity during the 2000s has been slightly below that of the 1990s, although by 2007 it had fallen to around 82 per cent of US productivity. If Australia's productivity had been the same as that of the US in 2007, other things being equal, Australia's GDP per capita would have been around $8,500 higher.

Chart 1: Australia's productivity level relative to the United States



Source: Groningen Growth and Development Centre (GGDC) and The Conference Board Total Economy Database, January 2008.

Productivity performance at the national level is the net outcome of decisions made at the industry and firm level, including entry, exit and the implementation of new ideas, new business models and new production activities. Therefore, analysing productivity at the industry level can help us understand aggregate differences.

At an industry level, Australia's productivity gap with the US could be due to two factors: industry structure — Australia has more low-productivity industries than the US; or the productivity gap within industries — Australian industries are less productive than US industries. The purpose of this paper is to examine which of these factors is most prominent using a new internationally comparable data set.

The first section reviews some of the existing literature in this area. In the second section industry structure differences are examined. The third section looks at productivity differences within industries. Finally, we investigate the extent to which some industries have caught up with the US and the implications for policy.

Comparing industry productivity

Identifying why Australia's productivity level has been below that of the US has been the subject of recent research. A range of microeconomic and macroeconomic reforms undertaken in Australia over the past quarter century contributed to Australia's strong productivity performance during the 1990s and narrowed the aggregate productivity gap with the US (Davis & Rahman 2006).

However, differences in geography and history are likely to limit Australia's ability to fully close the gap. Battersby (2006) provides evidence that geographic isolation may mean Australia will not be able to close the gap entirely. Indeed, the OECD (2008) found that distance to world markets has had a significant negative effect on Australia's GDP per capita. The OECD adjusted Australia's labour productivity to account for geography and found that the gap with US productivity fell from 17 to 10 per cent.

Dolman, Parham and Zheng (2007) use data from the Groningen Growth and Development Centre's (GGDC) *60 Industry database* to compare Australia's productivity performance to other OECD countries, between 1979 and 2003. They find that while the aggregate productivity gap between Australia and the US has been sizable and relatively stable over time, there has been a diversity of experience at the industry level. Australia's mining industry experienced higher productivity during this period, while manufacturing, wholesale and retail trade, utilities, communications and finance all maintained their respective productivity gaps with the US or fell further behind.

However, the authors caution that international comparisons at the industry level are affected by the accuracy of the measures, noting that the EU Klems project, which was not available at the time the paper was published, would potentially provide a richer set of internationally comparable data. Using the EU Klems database, this paper investigates whether industry structure or differences within industries cause the aggregate productivity gap between Australia and the US. Box 1 provides additional details on the EU Klems database.

Box 1: The EU Klems database

Klems is an acronym for the various categories of capital (K), labour (L) energy (E), material (M) and service (S) input measures the database utilises. The EU Klems database was developed as part of a project to analyse productivity in the European Union at the industry level and has been expanded to include other countries such as Australia, Japan and the US. It supersedes the *60 Industry database* developed by the GGDC, which due to the development of EU Klems will no longer be maintained. The primary difference between EU Klems and many of its predecessors including the OECD's Structural Analysis database is that it accounts for changes in composition of the labour force over time and across countries. This reduces the bias related to aggregate measures of multi-factor productivity commonly experienced with such databases. Capital input measures also take into account the effects of the rapid shift in investment towards Information and Communications Technology in recent years (Timmer, Ypma & Van Ark 2007).

The EU Klems database classifies industries according to the NACE (in French: Nomenclature statistique des Activités économiques dans la Communauté Européenne) classification system, which is very close to the International Standard Industrial Classification. This provides more detail than the two-digit GGDC *60 Industry database* used by Dolman, Parham & Zheng (2007) and is readily transferable to the Australian and New Zealand Standard Industrial Classification system used by the Australian Bureau of Statistics (ABS).

Industry structure

Geography, history, natural resource endowments and policy settings can shape the industry structure of a country's economy. Some industries are likely to form a bigger part of some economies than of others. It follows that any industry-level analysis of Australia's productivity relative to other countries should begin by comparing Australia's industry structure with that of other countries.

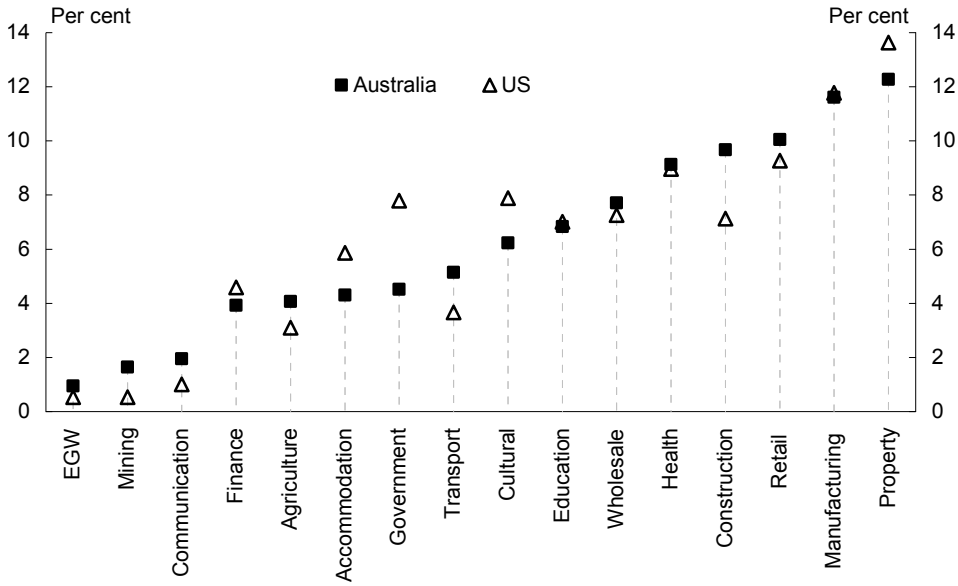
Industry structure matters for international comparisons of aggregate productivity because some countries have greater specialisation in economic activities with relatively high levels of productivity, while others may have an industry mix skewed

toward low productivity — more labour intensive — activities. This can limit the extent of productivity catch-up that is feasible (Dolman, Parham & Zheng 2007).

There are two widely accepted methods of defining industry structure, either using shares of gross value added or shares of total hours worked. The focus here is on labour productivity at the industry level therefore, the distribution of total hours worked between industries has been used to define industry structure.

Using this definition, the industry structure in the 22 OECD countries represented in the EU Klems database in 2005, was compared to Australia using a correlation analysis. By way of example, Chart 2 displays the industry structures of the US and Australia which have a correlation coefficient (R^2) of 0.928, reflecting a very strong similarity between the industry structure in the two countries, with both having a high proportion of labour employed in service industries, such as property, retail, construction, health and education.

Chart 2: Australia and US industry structure, 2005
Industry share of total hours worked, per cent

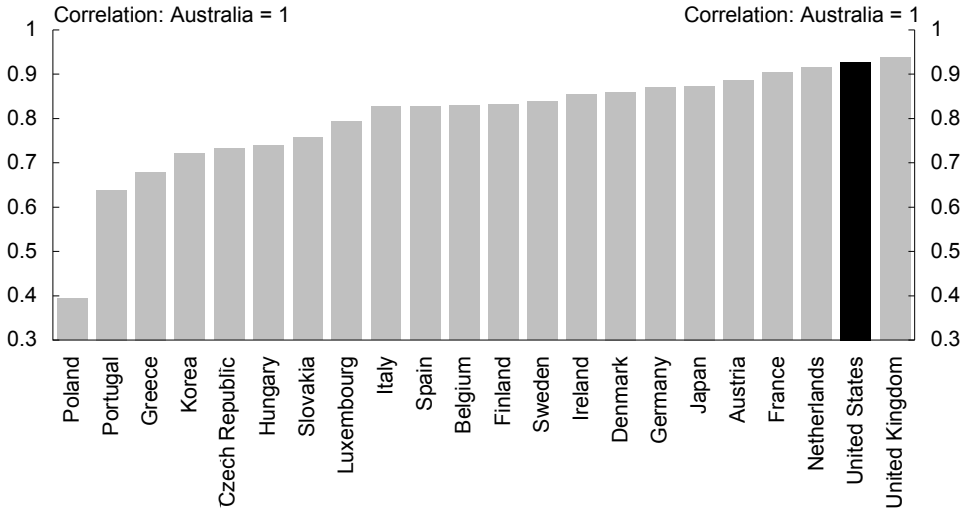


Source: EU Klems database (March 2008) and authors' calculation.

Chart 3 shows the correlation coefficient of shares of hours worked in 16 industries for 22 OECD countries, ranked in order, from least to most similar to Australia. Australia was used as the base, therefore Australia correlated against itself provided a correlation coefficient of 1. The UK with a correlation coefficient of 0.938 had the most similar industry structure to Australia, the US was next and Poland was last with an R^2 of 0.395. While the EU Klems database currently does not include Canada, calculations

using the GGDC *60 Industry database* indicate that Canada's industry structure may be more similar to Australia's than the UK's.

Chart 3: Correlation of industry hours worked shares in selected OECD countries with Australia, 2005



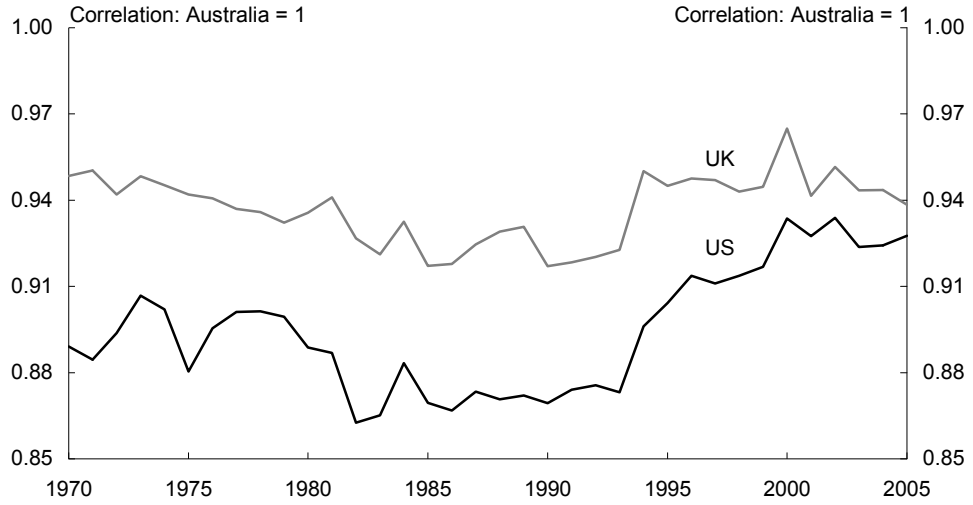
Source: EU Klems database (March 2008) and authors' calculation.

The correlation coefficients for the UK and US, the two countries whose industry structure bore the most similarity to Australia's, reveal that Australia's industry structure has become more like that of the US over the past decade, while remaining fairly stable against the UK industry structure (Chart 4).

The extent to which differences in industry structure between Australia and the US explain productivity differences between the two countries can be measured by comparing actual output in Australia to a hypothetical case in which Australia has the same industry structure as the US. The productivity levels within each industry in Australia are not changed, but the allocation of resources between industries in terms of hours worked are set to that of the US in each year.

The ratio of actual output to hypothetical output measures the extent to which output would have been different in Australia had the economy had the same industry structure as the US. If the ratio differs greatly from 1, industry structure is significant in explaining differences in aggregate output (and productivity). If the ratio is below 1, then, with unchanged Australian industry productivity, Australian aggregate productivity would be higher if Australia had US industry shares. That is, it could be concluded that the US has higher aggregate productivity because it has higher productivity industries.

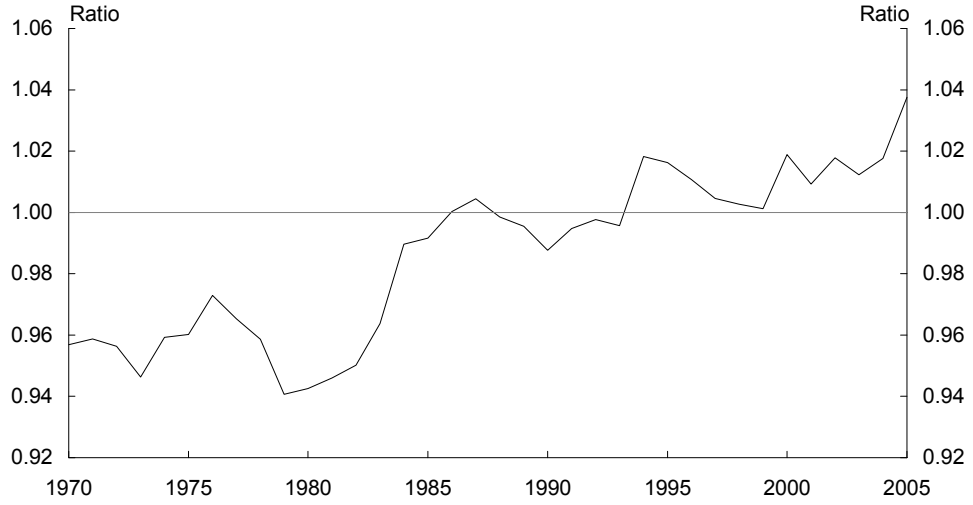
Chart 4: Correlation of industry shares in the US and UK with those in Australia, 1970-2005



Source: EU Klems database (March 2008) and authors' calculation.

Industry structure appears to have mattered in the past (Chart 5). In the 1970s through to the early 1980s, had Australia had the US industry structure, Australia's total output would have been up to 6 per cent higher. That is, in those years, Australia had relatively more low-productivity industries than the US.

Chart 5: The effect of industry structure on output in Australia (the ratio of actual to hypothetical output)



Source: EU Klems database (March 2008) and authors' calculations.
Note: A ratio below 1 means that Australia would have higher output if it had the same industry structure as the US, above 1 means that Australia would have lower output if it had the same industry structure as the US.

The ratio of actual to the hypothetical output has been around 1 between the late 1980s and late 1990s, suggesting that industry structure has not made too much of a difference to Australia's aggregate output during that time.

However, since 2000, with a US structure Australia would have had lower output and productivity. This result serves as a reminder of caution about assuming that there is an optimal industry structure. Industry structure should be determined by relative price signals in a market economy which, absent relevant externalities, ensures the allocation of resources to their most productive use and allows an economy to specialise in its area(s) of comparative advantage.

The importance of industry structure to bridging the aggregate productivity gap between Australia and the US has diminished since the mid 1980s as Australian industry structure has become more similar to that of the US. Therefore it follows that productivity differences within industries between Australia and the US must be playing a more prominent role.

Productivity differences within industries

This section explores relative productivity levels and growth rates over the 1990s and early 2000s to discern which Australian industries were catching up to US productivity levels in those periods. In understanding this analysis, it is important to acknowledge a range of measurement and methodological issues that should be taken into consideration when making international comparisons of industry productivity. These issues are summarised in Box 2.

Australian-US productivity differences within industries can be shown graphically (Charts 6, 7 and 8). The level of productivity in each industry is expressed relative to the US productivity level in that industry (Lewis 2004). A ratio of 100 means that productivity levels are the same in the two countries. Australian industries with higher productivity levels relative to the US record a ratio above 100, while industries with lower productivity levels have a ratio below 100.

Here we look at industry productivity differences in 1990, 2000 and 2005. The first two years have been selected as they were the most recent two years when both economies were simultaneously at their business cyclical peaks. The most recent data available is for 2005. Comparative statics are useful for measuring the effects of changes over time, but do not account for the causation or path of growth, therefore care should be taken when analysing this data, given the limitations (see Box 2).

Box 2: Measurement and methodological issues

A number of measurement and methodological issues make international comparisons of industry productivity problematic.

It is not easy to measure output and inputs separately in some industries. Methods of measuring output for many industries are different across countries or depend on uncertain links with wages. This is why the ABS focuses on productivity in the market sector, which includes manufacturing and construction but not government administration. Similarly, the US Bureau of Labor Statistics publishes data for the private business sector. This presents difficulties when trying to interpret the results for non-market sector industries presented in this paper.

Inputs and outputs are also generally measured in terms of value added. This presents another difficulty in international analysis of productivity levels as we must choose an exchange rate to compare national data. Using market exchange rates is not appropriate for this purpose as they do not always reflect relative price differences between countries. For example, if an industry had lower prices in Australia than in the US, productivity in that industry would be understated in Australia relative to the US. The standard method used in international comparisons, which this paper also uses, is to convert national currency estimates of productivity into purchasing power parity (PPP) US dollar equivalents using standard PPP exchange rates.

However, using standard PPP exchange rates to compare industry productivity levels has problems because these exchange rates do not take into account within-country relative price differences. For example, if an industry has lower prices relative to other goods in Australia than in the US, then using standard PPP exchange rates would still understate productivity in that industry in Australia relative to the US. This might be the reason why agriculture appears to be less productive in Australia than in the US.

The alternative to using economy-wide PPP exchange rates is industry-specific PPP conversion; however the quality of conversion factors used across industries can vary greatly. Timmer, Ypma & Van Ark (2008) have recently developed a set of industry specific output PPPs designed to overcome these difficulties but have noted they are limited in their scope to provide accurate international comparisons of value added and total factor productivity in a full-scale EU Klems framework.

Productivity growth varies with the business cycle (Basu & Fernald 2000; Rahman & Tunny 2006). As a result, care needs to be taken in choosing the year of comparison for analysis. If the comparison is made in a year when the Australian economy is growing strongly but the US economy is in recession, then this would overstate relative productivity in Australia. This paper uses comparative statics to analyse the productivity differences in 1990, 2000 and 2005. The first two years have been selected as they were the last two years when both economies were simultaneously at their business cyclical peaks. The most recent data available is for 2005. Comparative statics are limited inasmuch as it compares relative productivity levels at different points in time, but does not study the cause, motion or progress of change. As a result, care should be taken in making policy recommendations.

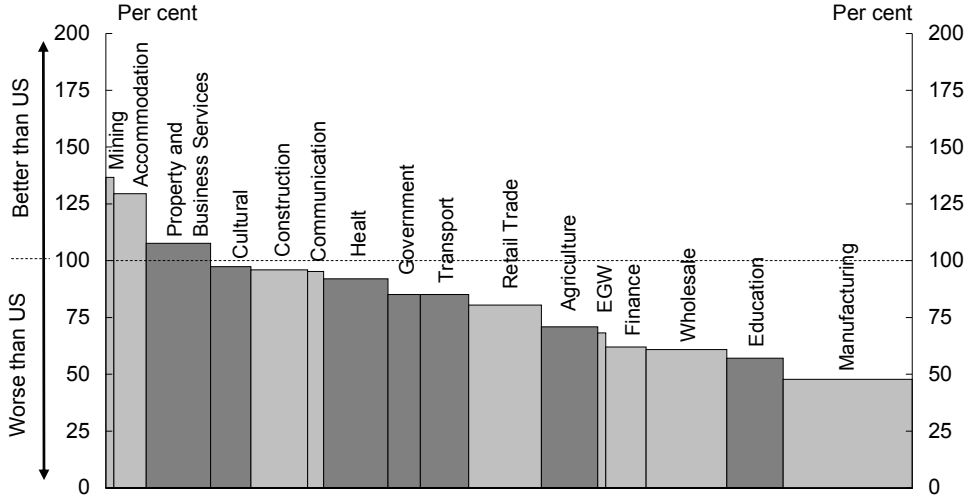
In Charts 6, 7 and 8, the width of each column is calculated using the industry's share of hours worked in the Australian economy. To simplify the presentation, data for the 71 industries provided in the EU Klems database are summarised into 16 industries that are broadly similar to the industry classification used by the ABS. Small industries within these broader groups can have a strong influence on productivity if they have very high or very low productivity. As a result, countries with identical industry productivity might have very different results at this level of aggregation due to different structures within the broader industry groups.

The resulting charts provide a simple view of industry productivity differences between the two countries and the relative importance of industries for Australia. The vertical axis represents the relative productivity level — taller industries are more productive relative to the US; and the horizontal axis reflects the industry structure — wider industries make up larger parts of the Australian economy in terms of hours worked. For example, in 1990 mining accounted for around 1 per cent of the Australian economy and was more than 30 per cent more productive than the mining industry in the US (Chart 6). Manufacturing accounted for around 15 per cent of the Australian economy and was half as productive as the US.

Productivity differences within industries between 1990 and 2000

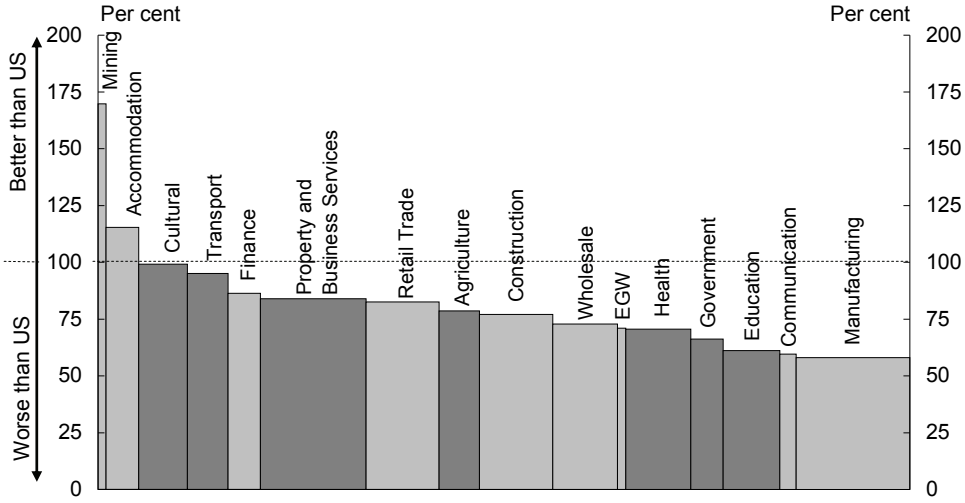
Charts 6 and 7 show productivity levels relative to the US in 1990 and 2000. A comparison of the two charts reveals movements in industries in terms of rankings, productivity improvements and changes in industry structure between 1990 and 2000.

Chart 6: Productivity levels in Australian industries relative to the US, 1990



Dark grey industries are where data contain significant measurement or methodological issues (see Box 2).
Source: EU Klems database (March 2008) and authors' calculation.

Chart 7: Productivity levels in Australian industries relative to the US, 2000



Dark grey industries are where data contain significant measurement or methodological issues (see Box 2).
Source: EU Klems database (March 2008) and authors' calculation.

A comparison between 1990 and 2000 reveals significant movement between industries in the period. Table 1 displays each industry categorised by its productivity performance relative to the US in 1990 and 2000. The categories separate those industries that surged ahead, caught up, lost ground or fell behind. Industries surged ahead if in 1990 they were ahead of US productivity and in 2000 increased their lead further. Industries caught up if they had productivity levels lower than the US in 1990 and experienced faster productivity growth than the US during the 1990s. An industry lost ground if in both 1990 and 2000 it was ahead of US productivity but had lower relative productivity in 2000. An industry fell behind if it was below the US in 1990 and experienced slower productivity growth than the US. The table also displays the industry structure in terms of hours share.

Of the industries whose productivity exceeded that of the US in 1990, only mining surged ahead during the period with productivity in 2000 almost 70 percentage points above that of the US. Finance displayed the largest improvement while wholesale trade, manufacturing and transport, agriculture, education, utilities (electricity, gas and water), retail trade and cultural services also improved. Of these, measurement and methodological issues make it difficult to interpret the results for transport, agriculture, education and cultural services. However, reforms over the past quarter century opened many of these industries to competition, fostering innovation and investment, and generating faster productivity growth.

Table 1: Australia's industry productivity as a percentage of US industry productivity

Industry	Industry structure by hours share		Australian productivity by industry sector relative to US		
	1990	2000	1990	2000	Difference
Surged ahead					
Mining	1.4	1.1	136.6	169.7	33.1
Caught up					
Finance	4.6	3.9	61.9	86.3	24.4
Wholesale Trade	10.6	8.3	60.9	72.8	11.9
Manufacturing	15.7	13.5	47.7	58.0	10.3
Transport*	5.4	5.3	85.0	95.0	10.0
Agriculture*	6.8	5.6	70.8	78.5	7.8
Education*	6.4	6.7	57.1	61.2	4.1
Electricity, Gas & Water	1.3	0.8	68.2	71.0	2.8
Retail Trade	9.5	9.1	80.5	82.6	2.1
Cutural*	5.0	5.8	97.3	99.2	1.8
Lost ground					
Accommodation	3.8	4.6	129.5	115.3	-14.1
Fell behind					
Government*	4.5	4.0	85.0	66.2	-18.8
Construction	7.7	8.4	95.9	77.0	-18.9
Health*	7.5	8.4	92.0	70.6	-21.4
Property*	8.0	12.6	107.6	83.9	-23.7
Communications	1.9	2.1	95.2	59.6	-35.6

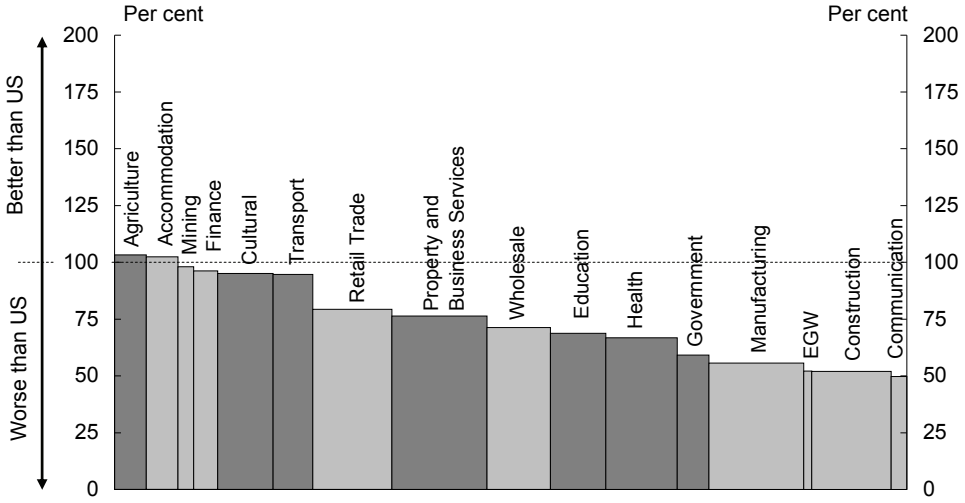
* Data containing significant measurement or methodological issues (see Box 2).
Source: EU Klems database (March 2008) and authors' calculation.

Accommodation lost ground over the period, while government services, construction, health, property and business services and communications all fell behind. Of these, measurement and methodological issues mean that only the results for construction and communications can be viewed with confidence. The pre-GST housing boom in the lead up to 2000 contributed to the decline in productivity in construction relative to the US, as the industry mix transitioned to the relatively more labour intensive activity of housing construction. As more labour was utilised to increase the housing stock, the construction industry share also increased. Meanwhile, the communications industry fell further behind as the US communications industry surged ahead in response to the rapid growth of ICT manufacturing.

Productivity differences within industries between 2000 and 2005

Chart 8 shows productivity levels relative to the US in 2005. A comparison of Charts 7 and 8 reveals significant movement between industries in the period. Table 2 displays each industry categorised by its productivity performance relative to the US in 2000 and 2005.

Chart 8: Productivity levels in Australian industries relative to the US, 2005



Dark grey industries are where data contain significant measurement or methodological issues (see Box 2).
Source: EU Klems database (March 2008) and authors' calculation.

None of the industries whose productivity exceeded that of the US in 2000 surged ahead during the five years to 2005. Indeed, mining, which had surged ahead during the 1990s, actually fell, with productivity only 98 per cent that of the US.

Slower mining productivity growth in Australia than in the US is likely due to the commodity boom. In response to a large increase in commodity prices there has been a rapid increase in investment and labour in the mining sector. As Table 2 shows the share of hours worked in the mining sector increased from 1.1 to 1.6 per cent between 2000 and 2005. However, this is not yet reflected in higher output (Ewing, Fenner, Kennedy & Rahman 2007).

In previous mining booms in the late 1970s and early 1980s it took around five years for the increase in mining investment to be translated to high growth in output (Gruen & Kennedy 2006). Furthermore, declining production in the oil sector (which has relatively high productivity within the mining sector) has also subtracted from productivity growth in mining.

Table 2: Australia's industry productivity as a percentage of US industry productivity, 2000-2005

	Industry structure by hours share		Australian productivity by industry sector relative to US		
Industry	2000	2005	2000	2005	Difference
Caught up					
Agriculture*	5.6	4.1	78.5	103.3	24.7
Finance	3.9	3.9	86.3	96.2	9.9
Education*	6.7	6.8	61.2	68.8	7.6
Lost ground					
Accommodation	4.6	4.3	115.3	102.4	-12.9
Fell behind					
Transport*	5.3	5.1	95.0	94.7	-0.3
Wholesale	8.3	7.7	72.8	71.3	-1.5
Manufacturing	13.5	11.6	58.0	55.7	-2.3
Retail	9.1	10.1	82.6	79.3	-3.3
Health*	8.4	9.1	70.6	66.8	-3.9
Cutural*	5.8	6.2	99.2	95.1	-4.0
Government*	4.0	4.5	66.2	59.1	-7.1
Property*	12.6	12.3	83.9	76.4	-7.5
Communications	2.1	2.0	59.6	49.7	-9.9
EGW	0.8	1.0	71.0	52.2	-18.9
Construction	8.4	9.7	77.0	51.9	-25.1
Mining	1.1	1.6	169.7	98.1	-71.6

* Data containing significant measurement or methodological issues (see Box 2).
Source: EU Klems database (March 2008) and authors' calculation.

Manufacturing, wholesale and retail trade, all of which caught up with the US during the 1990s, fell behind in the early 2000s. These three industries make up almost a third of hours worked in the Australian economy and a quarter of gross value added. As such, any productivity differences in these industries relative to the US have the potential to significantly affect the degree of catch up in productivity that might be obtainable.

In the early 2000s, finance, education and agriculture continued to catch up with the US, with productivity in finance and agriculture almost the same as in the US. Measurement and methodological issues make it difficult to interpret the results for agriculture and education. With respect to finance, it is likely that the financial market reforms of the 1990s and early 2000s and investment in new ICT capital are continuing to have a positive effect on productivity in the financial sector.

During the 1990s these industries benefited from regulatory reforms, adoption of new technology, competition and rationalisation in these industries over the period (DIISR 2008). However, these benefits may have been one-off, rather than having an ongoing influence on productivity growth. Indeed, productivity growth in Australian manufacturing and wholesale and retail trade during the early 2000s was slower than in the US.

It may be that in these industries the extent to which Australia can catch up to the US productivity is limited by other factors, such as geography (Wilkie & McDonald 2008). Australia's market is small and fragmented and for much of Australia's history tariff barriers isolated its manufacturing firms from large foreign markets. As a result, Australian manufacturers are unable to access the same economies of scale that firms in the United States are able to access in their own large and well integrated domestic market. Similarly, geography and population settlement patterns in the US provide economies of scale in warehousing and distribution.

Another factor that may limit Australia's ability to close the productivity gap within the manufacturing industry is differences in comparative advantage — an ideal industry structure will reflect comparative advantage. For example, Australia has a comparative advantage in mining due to its abundant natural resources. The US has a comparative advantage in ICT manufacture and as a result ICT manufacture grew rapidly as a share of total manufacturing during the 1990s. Australia does not have a comparative advantage in ICT manufacture and we would not expect Australia's ICT manufacture as a share of total manufacturing to expand greatly.

However, comparative advantage does not affect Australia's ability to adapt and use ICT technology to boost its productive capacity. As productivity improves in overseas ICT manufacture and competition continues to lower the prices of ICT, Australia will continue to benefit from terms-of-trade and further productivity gains as Australian firms innovate and adapt ICT technologies (Dolman, Parham & Zheng 2007).

Concluding remarks

This paper has used industry level data from the EU Klems project to shed light on Australia's aggregate productivity gap with the US. It shows that Australia and the US have a very similar industry structure in terms of hours worked, with Australia becoming more like the US over time. As such, it appears that differences in productivity between Australia and the US are not due to industry structure but instead are due to productivity differences within some specific industries. For example, manufacturing, distributive trades and some other services form a large proportion of Australia's economy and performed poorly in comparison to US productivity levels.

Australia's geography, size and settlement patterns appear to be an ongoing limiting factor which may affect the extent to which Australian industries can close the productivity gap with their US counterparts. Governments can do nothing to affect geography; however they can ensure that Australia has the right policy settings, maintaining good macroeconomic and microeconomic frameworks to allow the

efficient allocation of resources to their highest productive use. Appropriate policy settings play a supporting role to enable sound investment decisions by private firms.

If Australia's aggregate productivity is to catch up further with US productivity, it will be the result of decisions made at the industry and firm level. Policy settings fostering open competition, flexibility and innovation will assist firms and industries in making optimal choices, as will the removal of distortions around participation and investment.

Productivity enhancements in the area of government services such as utilities (electricity, gas and water), health and education would also be of benefit. Reforms to increase the efficiency of public service provision and network industries of utilities, transport and infrastructure can assist in addressing the productivity gap.

Productivity improvements usually arise from a larger ongoing reform process and are likely to be one of the benefits of reforms enacted within the National Reform Agenda. The Productivity Commission (2006) estimate that improving productivity and efficiency through the three streams — competition, regulatory reform and human capital (education and health) — could have substantial impacts on Australia's aggregate performance.

Future research could extend the paper's analysis in a number of ways. Although this paper used aggregate PPP exchange rates, the use of industry PPP exchange rates is preferable when comparing industry productivity levels across countries. A set of industry-specific PPPs is being developed for use with the EU Klems framework (Timmer, Ypma & Van Ark 2008). As these rates become available, they should be used to replicate the above analysis. This research could also benefit from firm level analysis, either econometric or case study, to establish the impact of microeconomic reform on firm-level productivity. The imminent release of the ABS' Business Longitudinal Database (BLD) should aid future research. The BLD will contain data to enable the identification and understanding of possible drivers of firm-level productivity growth and performance more generally and the capacity of businesses to undertake those activities.

References

Basu, S & Fernald, J 2000, 'Why is productivity procyclical? Why do we care?', *NBER Working Paper,* no. 7940.

Battersby, B 2006, 'Does distance matter? The effect of geographic isolation on productivity levels', *Australian Treasury Working Paper*, no. 2006-03.

Davis, G & Rahman, J 2006, 'Perspectives on Australia's productivity prospects', *Australian Treasury Working Paper*, no. 2006-04.

Department of Innovation, Industry, Science and Research (DIISR) 2008, *Manufacturing Sector: Overview of Structural Change*, Industry Brief, Canberra.

Dolman, B, Parham, D & Zheng, S 2007, 'Can Australia Match US Productivity Performance?', *Productivity Commission Staff Working Paper*, Canberra.

Ewing, R, Fenner, S, Kennedy, S & Rahman, J 2007, 'Recent productivity growth outcomes and Australia's potential growth', *Economic Roundup*, Winter.

Gruen, D & Kennedy, S 2006, 'Reflections on the global economy and the Australian mining boom', *Economic Roundup*, Spring.

Krugman, P 1991, *The age of diminished expectations: US Economic Policy in the 1990s*, MIT Press, Cambridge.

Lewis, W 2004, *The power of productivity: wealth, poverty and the threat to global stability*, University of Chicago Press.

Organisation for Economic Co-operation and Development 2008, *Going for Growth,* OECD, Paris.

Productivity Commission 2006, *Potential Benefits of the National Reform Agenda*, Canberra.

Rahman, J & Tunny, G 2006, 'Estimating productivity trends in Australia', paper presented at the 35th Australian Conference of Economists, September, Melbourne.

Timmer, M, Ypma, G & Van Ark, B 2007, 'PPPs for Industry Output: A New Dataset for International Comparisons', *EU Klems Working Paper Series*, Groningen Growth and Development Centre, University of Groningen.

Wilkie, J & McDonald, T 2008, 'Economic geography and economic performance in Australia', *Economic Roundup,* Issue 3, 2008.

How much of the variation in literacy and numeracy can be explained by school performance?

Andrew Leigh & Hector Thompson[1]

Family background is known to have a substantial impact on students' literacy and numeracy results. This raises questions about whether any of the remaining differences in results are due to school performance — or whether they are merely due to random noise. This article reviews research from the OECD's Programme for International Student Assessment (PISA) study, based on student-level analysis. It then presents new evidence based on publicly reported school-level data from Western Australia. Combining test results with data on schools' socioeconomic characteristics, this study estimates the degree to which some schools outperform those with similar characteristics. On a 'like schools' basis, school differences are shown to be persistent across subjects, grades and years.

1 The authors are from Social Policy Division, the Australian Treasury. This article has benefited from comments and suggestions provided by Robert Breunig, Bill Burmester, Nigel Ray, Catherine Thompson and Tony Zanderigo. The authors are particularly grateful to Damien Moore and Ralf Steinhauser for sharing Western Australian school performance data with us, and to Kris Erwood and Jordan Korda from the Australian Government Department of Education, Employment and Workplace Relations for sharing data on schools' socioeconomic status. The views in this article are those of the authors and not necessarily those of the Australian Treasury.

Introduction

For decades, education policymakers have recognised that socioeconomic factors such as income, race, and parental education are crucial determinants of students' outcomes. Not only do these factors matter; they also seem to matter more than school inputs. Since at least the 1966 Coleman Report in the United States, researchers looking at large samples of student test scores have found that family background characteristics explain a larger share of the variation in student performance than school characteristics.

Such findings — and the many subsequent studies that have looked at this question — have profound implications for education policy. The more that children's academic achievement is determined in the home, the less chance that policies to improve schools' performance will have a transformative impact on the life chances of disadvantaged students. At the extreme, if socioeconomic status entirely explains academic performance, it is pointless to think about reforming schools in order to raise educational outcomes.

This article considers this question by looking at the relationship between socioeconomic status and school performance in Western Australian public schools. Western Australia is the only Australian state that publishes the test score performance of all government schools. Although it would theoretically be possible to do so, this study does not identify any individual schools.

Using the relationship between socioeconomic status and school performance across Western Australian government schools, this article considers whether there are schools that consistently perform better or worse than their socioeconomic status would predict.

Naturally, test scores will vary somewhat from year to year, and from test to test. From a policy perspective, it is important to distinguish random fluctuations (for example, variation caused by a barking dog outside the classroom) from systematic overperformance/underperformance by a school which persists from subject to subject, grade to grade, or year to year.

This analysis is also helpful in thinking about how the socioeconomic status of a school's student body might be used in constructing a measure of the performance of like schools in literacy and numeracy assessments.

The article is structured as follows. The next section discusses the evidence from international PISA tests on socioeconomic status and performance. The article then describes the sources of testing and socioeconomic data that is used for Western Australia. Next, the study looks at the relationship between socioeconomic status and

test scores in Western Australia. The article then turns to consider whether the unexplained differences in school performance are lasting or random. The following section analyses the implications of the findings for performance of like schools in literacy and numeracy assessments. The final section concludes.

The OECD's Programme for International Student Assessment (PISA)

To date much of the domestic debate around the link between socioeconomic status and student outcomes has been informed by the OECD's PISA, a test administered to a sample of 15 year-old students in OECD and non-OECD countries. The use of PISA reflects the lack of publicly reported data on student outcomes and characteristics in Australia, rather than any quantitative advantages that PISA offers.

At the broadest level PISA provides two important insights. The first is that socioeconomic status matters. The second is that while it matters, it is by no means deterministic. Table 1 highlights both of these points. It shows the relationship between test scores and the composite PISA measure of socioeconomic status — the index of economic, social and cultural status (ESCS). This index is based on parental occupation and education, family wealth, home educational resources, and cultural possessions. Across all OECD countries, the index is standardised to have a mean of zero and a standard deviation of one.

Table 1: Socioeconomic status and student achievement of Australian students in PISA

	Average score	Slope	Share of variation explained
Scientific literacy			
PISA 2000	528	42	14%
PISA 2003	525	47	15%
PISA 2006	527	43	11%
Reading literacy			
PISA 2000	528	50	17%
PISA 2003	525	44	14%
PISA 2006	513	41	12%
Mathematical literacy			
PISA 2000	533	44	17%
PISA 2003	524	42	14%
PISA 2006	520	38	12%

Source: Thomson and De Bortoli 2008, p 229.

Table 1 (taken from Thomson & De Bortoli 2008) shows three characteristics of Australia's PISA results — the average score, the socioeconomic gradient (slope), and the share of variation across students that is explained by socioeconomic status.

In terms of its average score, Australia scored above the OECD mean (approximately 500) in all three tests. However, over the period from 2000 to 2006,

Australia's average PISA scores fell on each test (this drop was only statistically significant in the case of reading).

The next column shows the socioeconomic gradient, or slope. This is the effect on test scores of a one-unit increase in the ESCS index. The results show that a one-unit increase in socioeconomic status is associated with a 38-50 point increase in test scores; slightly over one school year of achievement. Between 2000 and 2006, the socioeconomic slope has flattened for reading and mathematics, with the change being statistically significant for reading.

Table 1 also shows the share of variation across students that can be explained by this single socioeconomic status measure. In the 2006 PISA tests, socioeconomic status explains 11-12 per cent of the variation in student results, leaving 88-89 per cent to be explained by other factors. The explanatory power of socioeconomic status in PISA has declined over the period 2000-2006, with this drop being statistically significant for reading and mathematics.

From Table 1, it can be seen that socioeconomic status does not explain much of the variation in student outcomes. Another way of thinking about this is that if one was to plot the relationship between ESCS indices and test scores, the dots would not cluster particularly closely to the line. There are many students whose PISA scores place them a long way above the line (performing better than expected on the basis of their socioeconomic status score) and lots of students sitting a long way below the line (performing worse than expected on the basis of their socioeconomic status).

There are many reasons why some students perform better or worse than their socioeconomic status predicts. Students of similar backgrounds might attend schools that differ in quality. There may also be aptitude differences across individuals (driven by genetics, environment, or other factors) that are not related to socioeconomic status. Other reasons could include mismeasurement of socioeconomic status, or measurement error in student testing.

The main focus of this article is on school, rather than individual, performance. It is important to distinguish how much variation is explained by socioeconomic status at the level of the individual student compared to the school level. Because variation amongst individual students is idiosyncratic, it will average out at the school level. As such, a much greater proportion of the variation will be explained by socioeconomic status at the school level than when the analysis is conducted at the individual level.

In the same way that researchers have used PISA to demonstrate how much variation can be explained by a single socioeconomic measure, this study uses Australian literacy and numeracy testing to demonstrate how much variation is caused by school performance alone.

Sources of test score and socioeconomic data

The test results analysed in this article are based upon benchmark data from the Western Australian Literacy and Numeracy Assessments, undertaken by government school students in grades 3, 5 and 7 in August of each year (grade 7 is a primary school grade in Western Australia). In each grade, students are tested in four areas — numeracy, reading, spelling and writing. The benchmark is set at a level such that students who do not meet it are deemed to be at risk of not making adequate progress in literacy and numeracy.

On its 'Schools Online' website (http://www.det.wa.edu.au/schoolsonline/), the Western Australian Government publishes the results for each test, grade, and school — provided that at least 10 students take the test. The reported result is the share of students achieving the benchmark. These results are publicly reported in bar charts, and this analysis converts them to numbers by measuring the heights of the bars. Across all tests and grades, the benchmark pass rate in Western Australia ranged from 10 per cent to 100 per cent, with a mean of 84 per cent.[2]

As a measure of family background, this analysis uses a socioeconomic status index calculated by the Department of Education, Employment and Workplace Relations (DEEWR). This is based on three variables — occupation, education and income — combined in the same manner as for the socioeconomic index used in the Commonwealth's non-government school funding formula. For more details on the methodology, see Farish (2008). The occupation, education and income variables are taken from the 2006 Census, and are measured at the collection district level. In urban areas, collection districts comprise approximately 220 dwellings. The DEEWR procedure aggregates scores by averaging the scores of the collection districts within a 2.5 kilometre radius of the school. The schools' SES scores range from 69 to 129, with a mean of 98.

While this socioeconomic indicator is a reasonable measure for the purposes of this analysis it is important to note that it suffers from two weaknesses.

The first limitation is that this measure omits students who live more than 2.5 kilometres from the school, since it is based upon the socioeconomic status of collection districts around the school's location rather than on the basis of the school's enrolments. To the extent that a school's enrolments are drawn from addresses outside

2 For the purposes of a 'like school' analysis, the use of a benchmark measure has some limitations. One is that the measure is insensitive to changes in performance at the top and bottom of the distribution. Another is that within the group of schools where all students meet the benchmark, the like schools ranking is simply an inverse function of schools' socioeconomic status.

the immediate vicinity of the school, they should ideally be included in the socioeconomic status index. In certain instances this difference would be substantial, for example in the case of selective or non-government high schools. However, because this analysis is only concerned with government primary schools, the socioeconomic status of the surrounding neighbourhoods should be a reasonably good proxy for the composition of the student body.

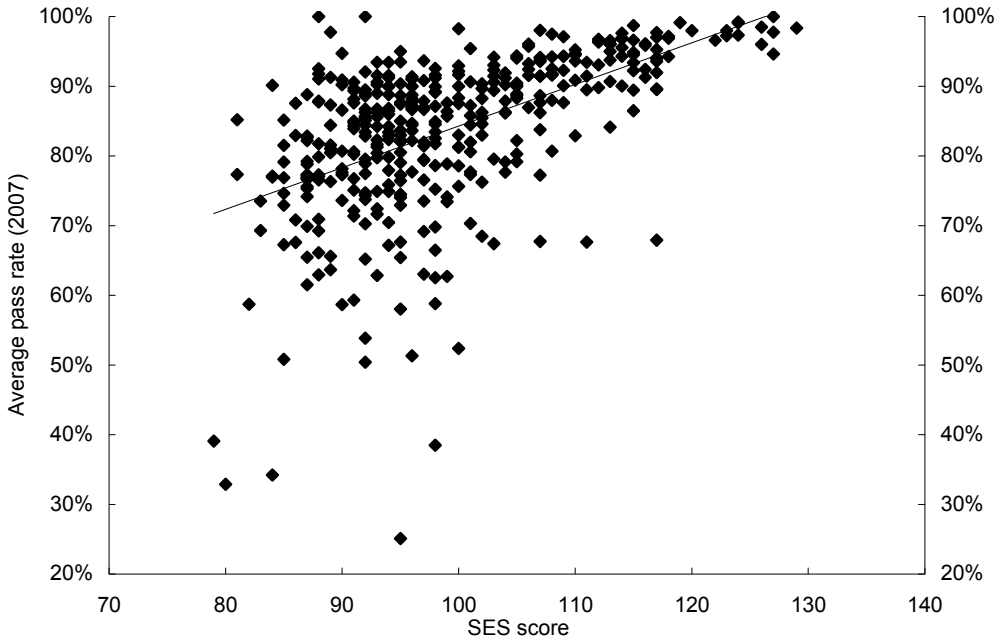
A related weakness is that the index may understate disadvantage in unequal neighbourhoods, since it measures student's socioeconomic status as the average in a geographic area. In certain instances this could cause a significant difference. For example in a neighbourhood that comprises both high and low socioeconomic status groups the average may overstate or understate a particular student's true socioeconomic status. Such an outcome might occur where public housing and expensive private housing sit within the same neighbourhood. The only way to address this issue would be to measure individual students' socioeconomic status, rather than rely on aggregates across those living in the same area.

In addition, this study also controls for two additional variables available via the Schools Online database — the number of children in a given school, and the share of pupils who are Indigenous. Note that while the SES measure captures the occupation, education and income mix in the neighbourhoods surrounding the school, the share of Indigenous students and size of the school are direct measures of the student body.

Explaining school performance with socioeconomic characteristics

Chart 1 shows a plot of the relationship between socioeconomic status and school performance, using test results from 2007, and taking a simple average across the four types of tests (numeracy, reading, spelling and writing) and three grades (grades 3, 5 and 7). There is a strong positive relationship between academic outcomes and socioeconomic status scores (on average, a 10 point increase in socioeconomic status scores is associated with a 6 percentage point increase in the pass rate). However, there is also considerable dispersion around this line, with the linear relationship between socioeconomic status scores and test results explaining only 28 per cent of the variation in student test scores.

Chart 1: Socioeconomic status and school performance[(a)]
(Each dot represents one school)



(a) Pass rate is the average for all tests and grades.

In Table 2, this study looks to see whether it is possible to explain more of the variation in socioeconomic status scores by allowing for a nonlinear relationship between socioeconomic status and student performance, or by including other variables, such as the share of students who are Indigenous, or the size of the school. Allowing for a nonlinear (quartic) relationship between SES and performance only increases the explained variation from 28 per cent to 31 per cent. Similarly, controlling for school size only increases the explained variation from 28 per cent to 29 per cent. However, when taking account of the share of Indigenous students in a school, the share of explained variation rises to 70 per cent.[3] Including all these variables in the regression together (a quartic in socioeconomic score, school size, and the share of pupils who are Indigenous), the model still cannot explain more than 70 per cent of the variation — leaving another 30 per cent that is not explained by these background characteristics.

3 For the schools in this sample, the share of Indigenous students in a school is a better predictor of performance than its socioeconomic status. In part this is driven by schools in regional areas. Restricting the regression to urban schools, the share of explained variation in the specification shown in column 5 of Table 2 falls from 70 per cent to 58 per cent.

Table 2: Explaining school performance with school-level controls[(a)]

Variables included:	(1)	(2)	(3)	(4)	(5)
Linear SES score	Yes	Yes	Yes	Yes	Yes
Quartic in SES score	No	Yes	No	No	Yes
School size	No	No	Yes	No	Yes
Share Indigenous	No	No	No	Yes	Yes
Share of variation explained	28%	31%	29%	70%	70%

(b) Sample size for all regressions is 394 schools.

As noted previously, when one moves from the level of the individual student to the level of the school, much of the individual-specific variation is averaged out. Consequently, these three socioeconomic variables are able to explain 70 per cent of the variation across schools in Western Australian data (Table 2), while a single socioeconomic index only explained 11-17 per cent of the variation across individual students in PISA data (Table 1).

It might also be the case that the present measure of socioeconomic status has not fully captured the variation across schools. Although the socioeconomic status score used here is a composite, it is only a single number, and therefore cannot capture the multidimensional variation across the individual characteristics that make up the index. Some evidence of the limits of such an approach can be seen from the fact that adding a variable denoting the share of Indigenous children at the school boosts the explanatory power of the model to about 70 per cent — leaving around 30 per cent to be explained by cross-school variation within the same socioeconomic groups. Given that school-level measures of socioeconomic status are less precise than the student-level socioeconomic information in PISA, it seems unsurprising that the present approach leaves 30 per cent of unexplained variation across schools, while a study using PISA data has found 18 per cent of unexplained variation across schools.[4]

Are the unexplained differences in school performance lasting or random?

Table 2 showed that about 70 per cent of the observed variation in school performance can be explained by schools' socioeconomic characteristics, leaving another 30 per cent that is not explained by these background characteristics. This raises the question of whether the remaining 30 per cent of 'unexplained' variance is merely random variation, or whether more systematic patterns can be discerned. The present analysis

4 Using multilevel modelling on the Australian PISA data, Thomson and De Bortoli (2008, p 229) estimated that 18 per cent of the variance in achievement between students was due to differences across schools.

tests this in three ways. Defining 'overperforming schools' as those that achieve better test scores than their socioeconomic characteristics would predict, one can ask:[5]

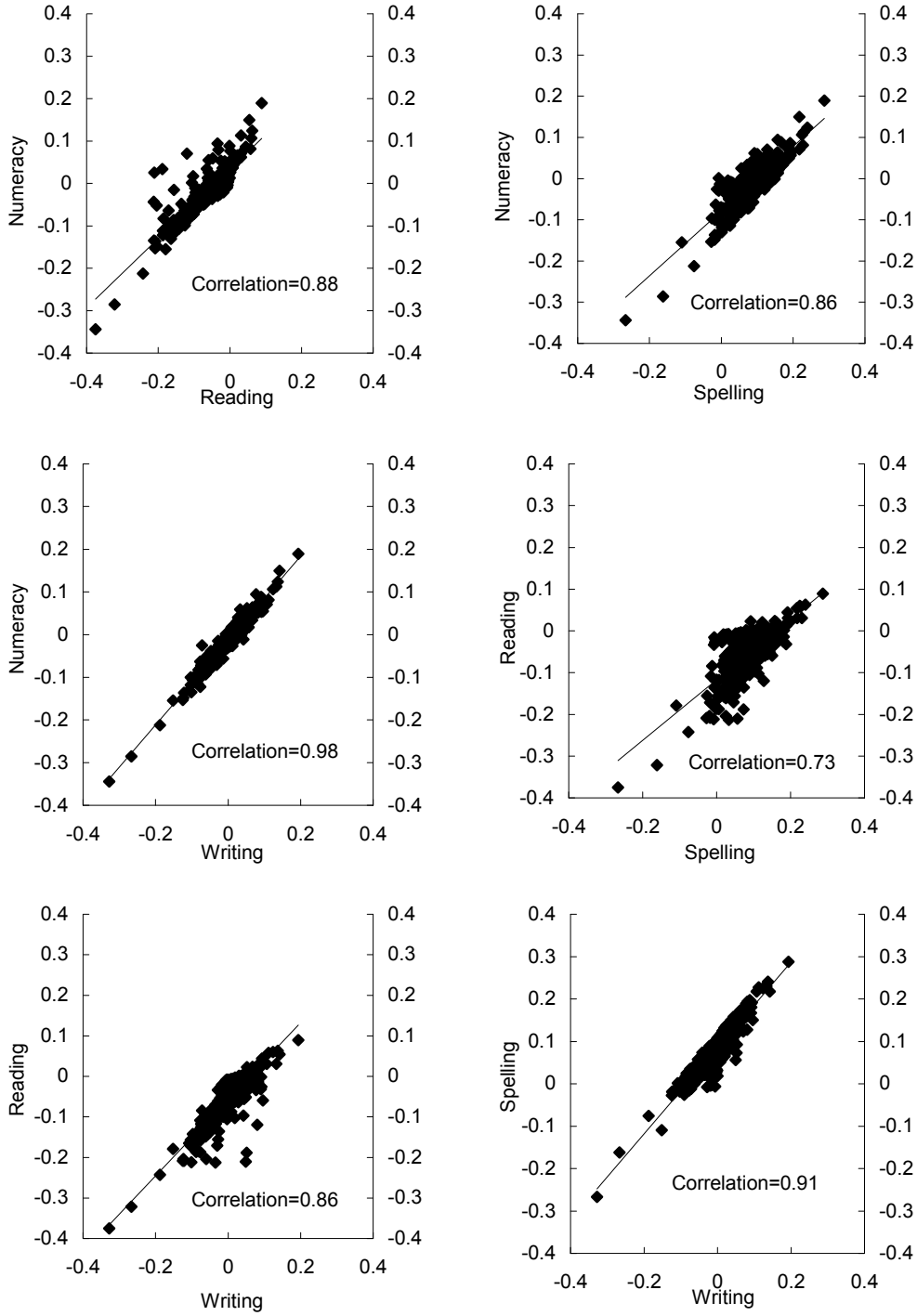
- do schools that overperform in one subject (for example, reading) also tend to overperform in other subjects (for example, numeracy)?
- do schools that overperform in one grade (for example, grade 3) also tend to overperform in another grade (for example, grade 5)?
- do schools that overperform in 2007 also tend to overperform in 2006?

If overperformance is simply due to random variation between tests, one should expect the answers to these three questions to be 'no'. To the extent that there are systematic patterns across subjects, grades and years, it is more likely that this analysis is capturing true differences between schools.

Chart 2 shows the relationship between measures of overperformance across different subjects. With four subjects, there are six possible pairwise comparisons. Schools which overperform in one subject (relative to their socioeconomic status) are very likely to also overperform in another subject. The correlations range from 0.73 (reading and spelling) to 0.98 (numeracy and writing).

5 This article uses 'overperformance' for simplicity; but one could just as easily use 'underperformance'.

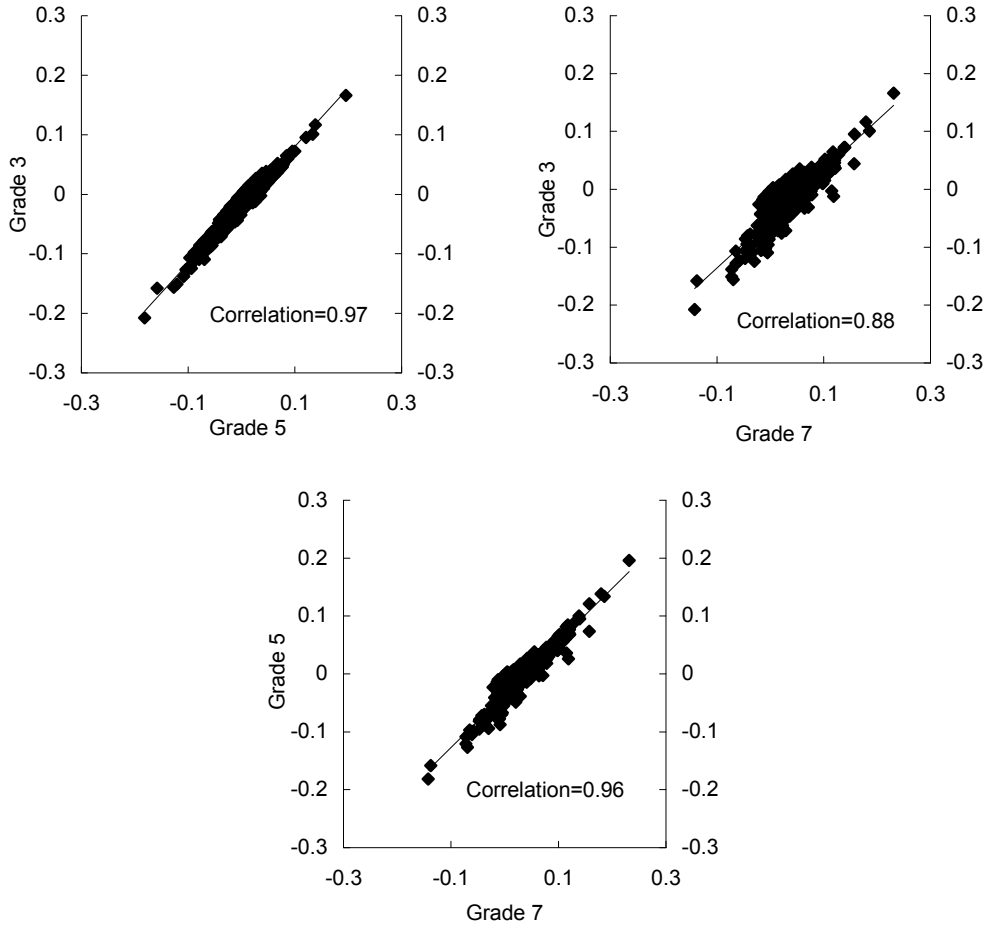
Chart 2: Comparing overperformance across subjects[(a)]
(Each dot represents one school)



(a) Graphs show the residual of a regression of test scores on a quartic in SES score, share Indigenous and school size.

The next question is whether overperformance is systematically correlated across grades 3, 5 and 7. It is important to recognise that this not only removes idiosyncratic school quality differences, but also within-school variation in teacher quality. While the same teacher typically provides instruction in reading, writing, spelling and numeracy, most schools have different teachers instructing grades 3, 5 and 7 (the exception will be composite classes in small remote schools, who are most likely not in the dataset). Chart 3 compares overperformance across grades. The three cross-grade correlations are 0.88, 0.96 and 0.97; not noticeably lower than the cross-subject correlations in Chart 2.

Chart 3: Comparing overperformance across grades[(a)]
(Each dot represents one school)

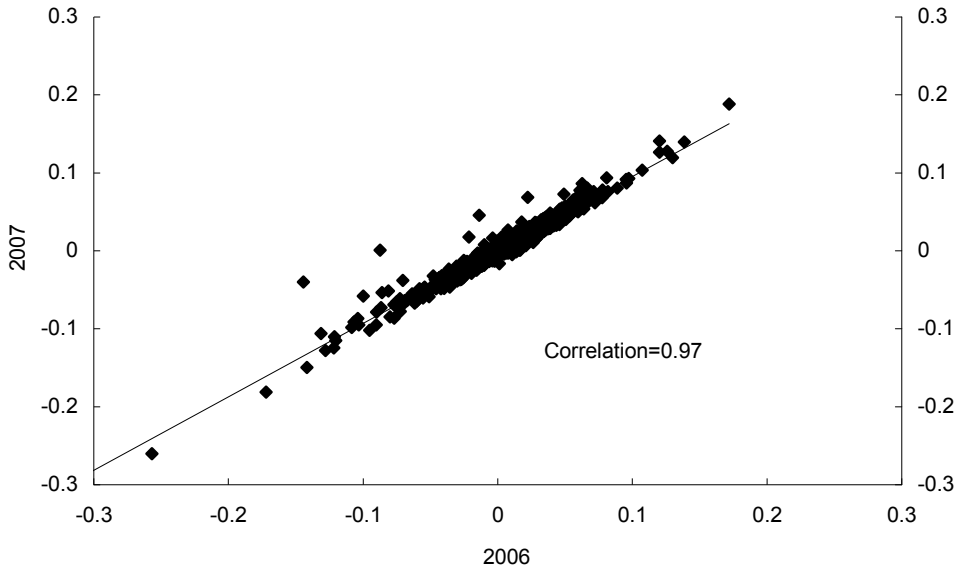


(a) Graphs show the residual of a regression of test scores on a quartic in SES score, share Indigenous and school size.

The third question is whether overperformance differs systematically from one year to the next. In other words, if in one year a school performs better than its socioeconomic status would predict, how likely is it that the school will repeat this the following year?

From Chart 4, it is possible to say that the answer is 'extremely likely'. Comparing schools' benchmark test results, there is a 0.97 correlation between tests in 2006 and 2007. Note that since the tests are administered to students every second year, there is no overlap between the cohorts who took these two tests (with the exception of students who skip or repeat a grade). This analysis therefore indicates that if students in a particular grade and school outperform those in a school with the same socioeconomic status, then it is very likely that students in an adjacent grade in the same school also overperform (relative to socioeconomic status).

Chart 4: Comparing overperformance across years[(a)]
(Each dot represents one school)



(a) Graphs show the residual of a regression of test scores on a quartic in SES score, share Indigenous and school size.

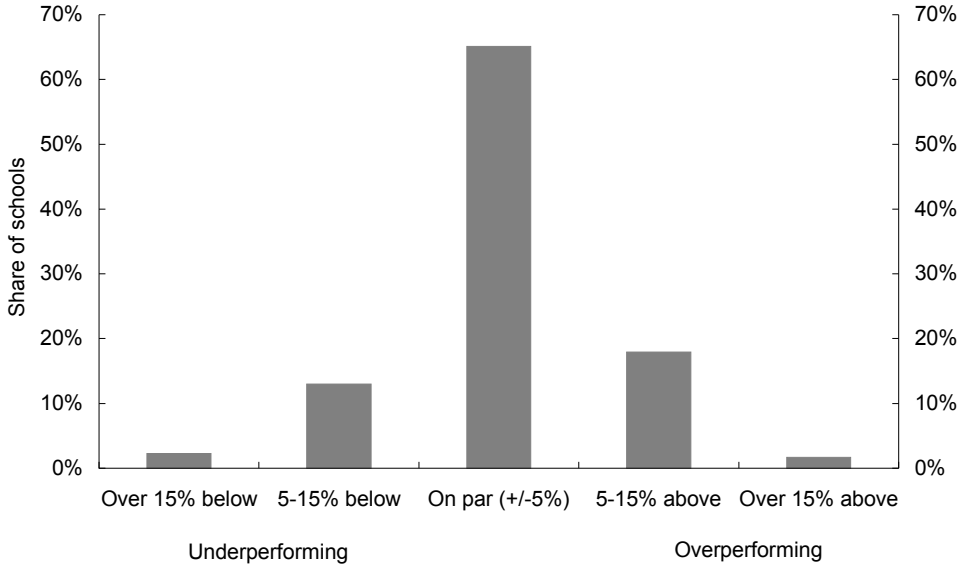
What are the implications for performance of like schools in literacy and numeracy assessments?

Chart 5 shows the distribution of underperforming and overperforming schools, relative to what one would expect, given the socioeconomic status score, school size, and share of Indigenous pupils. While 65 per cent of schools have a benchmark score that is within 5 percentage points of what would be expected given their socioeconomic status mix, 13 per cent are below the benchmark score for similar

socioeconomic status schools by 5-15 percentage points, and a further 2 per cent underperform their socioeconomic status peers by more than 15 percentage points.

Conversely, 18 per cent of schools outperform those of a similar socioeconomic status by 5-15 percentage points, and 2 per cent outperform schools of a similar socioeconomic status by more than 15 percentage points. To see the impact of such overperformance, recall that in a typical school, 84 per cent of students met the benchmark. To overperform by 15 percentage points would be equivalent to a school in a neighbourhood of average socioeconomic status in which 99 per cent of students met the benchmark.

Chart 5: Share of schools that are underperforming or overperforming compared with others of similar SES[(a)]



(a) Graphs show the residual of a regression of test scores on a quartic in SES score, share Indigenous and school size.

The schools which perform best on a 'like schools' analysis are not typically those that perform best on a comparison of test scores that is unadjusted for socioeconomic status. To illustrate this, Table 3 sets out the results for the five government primary schools in Western Australia that perform best on a 'like schools' basis and compares this to their raw ranking. There is a substantial difference between the two measures.

On a like schools basis, the school that performs best has a pass rate that is 26 per cent above what would be expected, given its size and socioeconomic characteristics. Yet its raw pass rate — 84 per cent — would place it 230th out of the 394 schools for which there are adequate data. Put another way, the socioeconomic characteristics of

School A predict that only 58 per cent of its students would meet benchmark, yet the school exceeded this by 26 per cent, with 84 per cent of students meeting benchmark.

A similar pattern can be seen across Schools B-E, which include a school that ranked equal 1st and a school that ranked 382nd. Across all schools, the Spearman rank correlation between raw rank and 'like schools' rank is 0.6, indicating that there are substantial differences between the two sets of rankings (that is, only 36 per cent of the variation in 'like schools' rank can be explained by raw rank.)

Table 3: How does a like schools comparison match up with a raw comparison?[(a)]

	Rank (like schools basis)	Overperformance	Rank (raw)	Pass rate (raw)
School A	1	26% above	230	84%
School B	2	21% above	125	90%
School C	3	20% above	382	59%
School D	4	19% above	1 (equal)	100%
School E	5	16% above	128	90%

(a) Note: Comparison is based on 394 schools. Overperformance measure is based on the specification shown in column 5 of Table 2.

Conclusion

This study has looked at the relationship between socioeconomic status and school performance in Western Australian public schools. The results suggest that a simple linear relationship between school results and socioeconomic status score explains less than one-third of the variation between schools. However, once one allows for a nonlinear relationship between socioeconomic status and performance, and takes account of the share of students who are Indigenous, these background characteristics account for over two-thirds of the variation across schools.

One possible explanation of the remaining variation is simply that it is due to random fluctuations. To test that hypothesis, this study looked at whether a school's 'overperformance' (relative to its socioeconomic status) was sustained across subjects, grades and years. In all cases, the evidence pointed to strong evidence of persistence. This suggests that it is likely that this 'residual' component of school performance captures something important about a school.

In terms of the how much impact a school can have, this analysis suggests that it can explain around one-third of the variation in literacy and numeracy skills. To the authors' knowledge, the only other publicly available analysis is that of the OECD which suggests that between-school variance can explain around one-fifth of the variation in PISA testing.

This level of variation has significant implications for students. Recall from Chart 5 that 20 per cent of Western Australian government schools outperform those of a similar socioeconomic status by more than 5 percentage points. Assuming that these schools would otherwise have been at the state average, this means that in these schools, at least one-third of students who would otherwise not have met the benchmark, do meet the benchmark. This highlights that for students who are at risk of not meeting the benchmark, being in a better performing school can make a difference.

What might affect whether a school performs better or worse than its socioeconomic status would lead one to expect? There are many possibilities, ranging from permanent features of the school itself to transitory aspects such as the current principal and cohort of teachers. However, the first step in determining this is ascertaining which schools are performing better or worse. This knowledge is important in assisting governments, principals, teachers, parents and the community to improve the performance of all schools.[6]

These results provide some evidence in favour of the proposition that socioeconomic status does not determine a school's destiny. Using the data available, there appears to be considerable variation between schools of a similar socioeconomic status. 'Like schools' (on the socioeconomic dimension) do not invariably produce 'like results'.

6 There is good international evidence that that the publication of school-level test scores tends to improve the performance of all schools. See for example Carnoy and Loeb (2002); Hanushek and Raymond (2005); Hanushek and Raymond (2006); OECD (2007).

References

Carnoy, M and Loeb, S 2002, 'Does External Accountability Affect Student Outcomes? A Cross-State Analysis', *Educational Evaluation and Policy Analysis*, Winter, vol. 24, no. 4, pp 305–331.

Coleman, J 1966, *Equality of Educational Opportunity,* U.S. National Centre for Educational Statistics, Washington DC.

Farish, S 2008, *Funding Arrangements for Non-government Schools 2009-2012. Recalculation of the Modified A Socioeconomic Status (SES) Indicator using 2006 Australian Bureau of Statistics Census Data,* Consultant's Technical Report, Department of Education, Employment and Workplace Relations, Canberra.

Hanushek, EA and Raymond, ME 2006, 'School Accountability and Student Performance', *Regional Economic Development*, vol. 2 no. 1, Federal Reserve Bank of St Louis, pp 51-61.

Hanushek, EA and Raymond, ME 2005. 'Does School Accountability Lead to Improved Student Performance' *Journal of Policy Analysis and Management,* vol. 24 no. 2, pp 297-327.

OECD, *PISA 2006: Science Competencies for Tomorrow's World*. OECD, Paris.

Thomson, S and De Bortoli, L 2008, *Exploring Scientific Literacy: How Australia Measures Up. The PISA 2006 Survey of Students' Scientific, Reading and Mathematical Skills,* Australian Council for Educational Research, Melbourne.

Fiscal space in the G-20

Laura Doherty and Luke Yeaman[1]

The G-20[2] is a forum that promotes open and constructive discussion between the advanced and major emerging economies on key issues related to global economic stability. The inclusion of fiscal space in the G-20 work program for 2007 and 2008 highlights the importance of this issue for both developed and major emerging market economies.

Fiscal space reflects a government's capacity to finance new spending without harming medium and long-term fiscal sustainability. Although there are some well-established tenets of good fiscal management, there are also a number of contemporary challenges in this area.

Drawing on discussions within this forum, this article highlights the importance of fiscal space for G-20 countries and outlines the contemporary challenges they face in this area.

---

1 At the time of writing, the authors were members of Macroeconomic Group in the Treasury. The views in this article are those of the authors and not necessarily those of the Australian Treasury or the Australian Government. The authors would like to thank Gordon de Brouwer, Tony McDonald, Bill Brummit, Olaf Schuermann, Leslie Williams and Hector Thompson for their useful comments.

2 The G-20 comprises the finance ministries and central banks of Argentina, Australia, Brazil, Canada, China, EU (represented by the current, rotating presidency of the EC), France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, UK and US. The IMF and World Bank participate on an ex-officio basis.

Introduction

The Group of 20 (G-20) remains the most legitimate global economic forum for influencing the direction of major global economic and financial governance issues. It is a key vehicle for advancing Australia's strategic interests, particularly with key emerging market economies such as China and India, complementing our regional engagement efforts through other forums such as Asia-Pacific Economic Cooperation (APEC) and the East Asian Summit.

Australia has been an active member of the G-20 since its inception in 1999, highlighted by our 2006 host year and membership of the G-20 management committee ('troika') from 2005 to 2007.[3] Australia particularly values the specific make-up of the G-20 membership and the opportunity this affords the forum to act as a circuit breaker for difficult global issues.

While the G-20 has maintained its core policy discussions relating to strengthening the Bretton Woods Institutions, domestic financial systems, and monetary and fiscal frameworks to help ensure international global financial stability, over time we have seen an increased breadth of issues included for discussion by Ministers and Governors. The inclusion of fiscal space topics in the G-20 work program for 2007 and 2008 is a good example of this, highlighting the importance of this issue for the major economies of the world and recognising its international dimensions.

Fiscal space is certainly not a new issue; it represents the traditional budget problem of how best to prioritise and evaluate government spending against the cost of raising revenue. However, it has been the subject of renewed interest in international policy discussions of late. The recent scaling-up of aid flows by developed countries — associated with the Millennium Development Goals — has drawn additional attention to the fiscal space debate in low-income countries.

Fiscal space is also an important issue for developed and major emerging market economies. The principles of sound fiscal management and budgetary flexibility (embodied in the concept of fiscal space) contribute to improved economic stability, competitiveness and living standards, regardless of a country's income level.

This article highlights the importance of fiscal space for G-20 countries and outlines some of the contemporary challenges they are facing in this area.

3 For further information on Australia's experience as G-20 host in 2006, see de Brouwer and Yeaman (2007).

The importance of fiscal space

'Fiscal space' can be defined as 'the capacity of a government to provide financial resources for a desired purpose, subject to the constraint that the fiscal position is sustainable, both over the medium and long-term' (Heller 2007). Fiscal space is certainly not a new issue; it represents the traditional budget problem of how best to prioritise and evaluate government spending against the cost of raising revenue. However, it has been the subject of renewed interest in international policy discussions of late.

To maintain strong economic growth and rising living standards, all countries need the financial capacity to invest in essential social and physical infrastructure. Demands for new infrastructure vary between countries and are always changing as new economic challenges emerge. For example, taking advantage of breakthroughs in technology requires a higher level of investment in education, research and development and communications networks. Improving transport infrastructure (roads, rails and ports) can help commodity exporters reap the full benefits from the current global commodities boom. Climate change will require investment in new infrastructure that encompasses cleaner technologies.

Most G-20 countries are able to raise funds in domestic and international capital markets at a relatively low cost, and the risk of government insolvency is low. Yet failure to create or maintain adequate fiscal space is likely to bring considerable costs. The consequences will likely be higher debt (with associated servicing costs), increased taxes or the need to reduce government spending. This is likely to be both politically unpopular, and harm economic growth and social well-being. It can also impair macroeconomic management, putting upward pressure on inflation and interest rates, and distorting consumer and business incentives. In most cases, early action to address a potential fiscal risk leads to significantly lower costs than when action is delayed.

Even if a government's overall fiscal position is sustainable over the medium to long term, improvements can further boost incentives and social and economic outcomes. In a highly competitive global economy, countries are continually looking for ways to gain an economic edge.

Creating and maintaining fiscal space

There are a number of well-established tenets of good fiscal management that are commonly adopted by most G-20 (and many other) countries.

It's widely accepted that a prudent medium-term fiscal framework can contribute to fiscal sustainability. Such a framework allows both tax and expenditure policies to be comprehensively and jointly assessed against a government's broad strategic priorities and stated fiscal objectives. For example, the Australian Government's fiscal strategy

aims to ensure sustainability through achieving budget surpluses, on average, over the medium term.[4]

The benefits of longer-term (or intergenerational) fiscal frameworks are also being increasingly examined and recognised by G-20 countries. Current government policies can have significant, long-lived and often unforseen implications for the future fiscal position over time, and hence the welfare of future generations. For example, demographic change (population ageing or rapid growth) is a long-term issue of particular concern to many G-20 countries. In Europe and Japan, the combination of an ageing population and rising health costs is already placing significant pressure on the fiscal position.

If these risks are identified early, through intergenerational estimates, measures can be put in place to prevent or ameliorate fiscal stress. In Australia, the *Charter of Budget Honesty Act 1998* requires that an Intergenerational Report (IGR) be released regularly to assess the long-term sustainability of current Government policies over the following 40 years. Although economic projections over such extended time horizons will inevitably be imprecise, intergenerational reporting can provide a general indication of where fiscal stress is most likely to emerge. The IGR can also be instrumental in helping to build public support for changes to existing unsustainable policies by identifying the need to address the emerging fiscal gap and improve the government's long-term fiscal position.

Transparency is another accepted hallmark of good fiscal management (and good public sector governance more generally). Fiscal transparency makes those responsible for the design and implementation of fiscal policies more accountable, reducing the power of special interest groups and leading to stronger, more credible policies that are likely to improve fiscal space and benefit the community.

The IMF has outlined the key elements of fiscal transparency as being:

- roles and responsibilities in government should be clear;
- information on government activities should be provided to the public;
- budget preparation, execution, and reporting should be undertaken in an open manner; and
- fiscal information should attain widely accepted standards of data quality and be subject to independent assurances of integrity (IMF 2007).

4 This strategy is supplemented by secondary objectives of keeping taxation as a share of GDP on average below the level for 2007-08 and improving the Australian Government's net financial worth over the medium term.

Contemporary challenges to fiscal space

There are a number of contemporary challenges facing G-20 countries seeking to create and maintain fiscal space. These challenges have been the core focus of discussions in the G-20 (and also in APEC).

Institutions to support the budget process

A sound fiscal framework encourages policy-makers to take a comprehensive view of the costs and benefits of their tax and expenditure decisions. The institutions that support the budget process must also be equally well-designed and properly implemented.[5] These institutions can be 'hard', such as legislation, rules and regulations or 'soft', such as codes of conduct, guidelines or cultural norms. Indeed, in 2007, G-20 Ministers and Governors noted that the 'design of effective medium-term fiscal frameworks and the institutional underpinnings of successful national budgeting' are important factors in finding and creating fiscal space (G-20 Ministers and Governors Communiqué 2007).

This year in Brazil, G-20 Ministers and Governors will focus on the importance of budgetary frameworks and processes for evaluating and prioritising spending.

Strong institutions can prevent budgetary processes from being circumvented, including limiting spending being approved outside of the budget process; reduce the potential for corruption; and help ensure that new policy proposals receive adequate and comprehensive evaluation and assessment. In general, a strong central budgetary coordination agency can assist in encouraging adherence to the budget process, including any fiscal rules or targets (Krogstrup & Wyplosz 2006).

It is also important to have the appropriate institutions that ensure individual spending programs (and tax policies) are implemented efficiently. Traditional indicators of fiscal space at the macro level can sometimes mask significant inefficiencies at the micro level. The use of performance-based budgeting, ex post evaluations of government programs and comprehensive spending reviews are all being investigated within international forums like the G-20 with the aim of improving the efficiency of government expenditure.

Questions have been raised around the effectiveness of existing performance-based budgeting. According to Schick 'Efforts to budget on the basis of performance almost always fail …' (Schick 2005, p 9). However, work by the IMF has been more

5 There is extensive literature showing that the institutional framework supporting the budget processes has an important effect on fiscal outcomes. See *Fiscal Institutions, Fiscal Policy and Sovereign Risk Premia*, Hallerberg and Wolff (Deutsche Bundesbank, ZEI-University of Bonn, UCIS-University of Pittsburgh) Discussion Paper Series 1: Economic Studies No 35/2006.

supportive. Drawing on experience of performance-related expenditure reallocations in countries such as Australia, New Zealand and the United Kingdom, the IMF notes that 'although there has been little close empirical study of the role of performance information … there is reason to believe that this role may have been substantial' (Robinson and Brumby 2005).

Engagement with the private sector

The increased focus on efficiency has also led to greater private sector involvement in the provision of government services, especially in the form of public private partnerships (PPPs).

While this issue is not currently part of the discussions within the G-20 forum, identifying and managing the fiscal risks associated with PPPs is the subject of continuing work within the APEC Finance Ministers' Process.

The primary rationale for entering into a PPP should not be the creation of fiscal space. Rather it should reflect benefits that relate to risk sharing and efficiency — for example in cases where the private sector has the expertise or infrastructure necessary to provide a service at a lower cost than the government (Dickson & Lim 2007).

In many cases, PPPs can be a successful means of sharing costs between the public and the private sector. But there can be significant fiscal risks involved. Therefore, it is important that PPPs are carefully structured, with all the costs and benefits over the life of the project clearly identified. This is particularly true if a PPP includes a contingent liability (such as a guarantee of future revenue) that may result in significant off-balance sheet liabilities for the government. Attempting to measure and publicly report any contingent liabilities that arise from a PPP can help address this risk. It is also important that decisions regarding PPPs are taken within the broader budgetary framework so they can be properly assessed against other competing priorities. Identifying and managing the fiscal risks associated with PPPs is the subject of work within the APEC forum.

Wealth and stabilisation funds

Temporary surges in government revenue, while undoubtedly welcome for recipient countries, also present challenges for fiscal sustainability and the maintenance of fiscal space. They complicate budgetary planning, and may encourage governments to spend at unsustainable levels, while creating expectations that this spending will continue indefinitely. Increased revenue may also lead to insufficient attention being paid to the quality of investment projects, leading to inefficiencies. For resource-rich countries, governments need to consider the intergenerational implications of exhausting resource endowments and the extent to which the proceeds should be

saved or invested for future generations. The current commodity price boom makes these issues of key interest to many G-20 countries.

In some countries, funds flowing from increases in revenue are being quarantined in sovereign wealth funds (SWFs), thereby enhancing fiscal space, investing for future generations and offsetting future liabilities. SWFs can also allow governments to smooth taxation over time, thus providing a more stable and predictable macroeconomic environment. Large current account surpluses among the export-orientated economies of East Asia are also contributing to the rise of SWFs (Devlin & Brummitt 2007).

In 2007, G-20 Ministers and Governors discussed the challenges of ensuring SWFs best serve their intended purpose (G-20 Ministers and Governors Communiqué 2007). Regardless of whether a SWF is established for stabilisation, savings or both, it is important that appropriate governance arrangements are established. SWFs should have clear overarching objectives; rules and operations that are transparent and free from political interference; clear asset management strategies and investment mandates; and have requirements for regular public reporting and independent audit and assessment of investment performance. It is also important that these funds complement and are integrated with the government's medium to long-term fiscal strategy.

Fiscal decentralisation

Most G-20 countries have a decentralised system of government, involving central, regional and local levels. There is no consensus on the ideal level or form of decentralisation. But well-designed arrangements, that promote close links between spending decisions and the preferences of the local population, can improve fiscal space by enhancing the efficiency of government spending.

However, coordination and accountability for public spending between different levels of government is often a challenge. Where this is the case, attempts to improve fiscal space at one level of government may simply shift the fiscal burden onto another level. A lack of coordination can also restrict the central government's ability to conduct macroeconomic management through the budget (Ter-Minassian & Fedelino 2007). Furthermore, sub-national levels of government may not feel bound by fiscal rules or frameworks, if implied guarantees from the central government exist. In 2007, G-20 Ministers and Governors noted that 'the coordination of expenditure across tiers of government can also be important for the overall coherence of efforts to create fiscal space' (G-20 Ministers and Governors Communiqué 2007).

Conclusion

In countries where the risk of crisis or insolvency present in some developing countries is not so stark, there could be a tendency to take good fiscal management for granted. The G-20 has recognised that good fiscal management is not just about being in the black. It is also about being able to recognise and finance spending that enhances social and economic development in a highly competitive global economy. The consequences of getting this balance wrong are real and significant.

Countries are looking for new ways to improve their frameworks and institutions to ensure they have adequate fiscal space. The fact that this topic is on the agenda of a key international forum such as the G-20 highlights the importance of this issue to the major economies of the world. Through its membership of the G-20, Australia is seeking to share our experience and draw on the lessons of other developed and developing economies.

References

Commonwealth of Australia 2008, Budget Paper No. 1, *Budget Strategy and Outlook 2008-09*, Canberra.

Commonwealth of Australia 2003, *Intergenerational Report 2003*, Canberra.

Dickson, T and Lim, A 2007, 'Transparency and sustainability of the public balance sheet: perspectives from APEC', *Economic Roundup*, Spring 2007.

Devlin, W and Brummit, B 'A few sovereigns more: the rise of sovereign wealth funds', *Economic Roundup*, Spring 2007.

de Brouwer, G and Yeaman, L 2007 'Australia's G-20 host year: a Treasury perspective' *Economic Roundup*, Autumn 2007.

G-20 2007a, G-20 Work Programme for 2007.

G-20 2007b, Meeting of Ministers and Governors Communiqué, Kleinmond.

G-20 2008, G-20 Work Program for 2008.

Heller, P 2007, *Fiscal Policy for Growth and Development: the Fiscal Space Debate*, Background paper prepared for the G-20 Workshop on Fiscal Policy, Istanbul.

Heller, P, Menachem, K, Debrun, X, Thomas, T, Koranchelian, T and Adenauer, I, 2006, *Making Fiscal Space Happen! Managing Fiscal Policy in a World of Scaled-Up Aid*, IMF Working Paper, WP/06/270, International Monetary Fund, Washington.

IMF 2007, *Manual on Fiscal Transparency*, International Monetary Fund, Washington.

Krogstrup, S and Wyplosz C, 2006, *A Common Pool Theory of Deficit Bias Correction*, CEPR Discussion Paper, DP5866, London.

Robinson, M and Brumby, J 2005, *Does Performance Budgeting Work? An Analytical Review of the Empirical Literature*, IMF Working Paper, WP/05/210, International Monetary Fund, Washington.

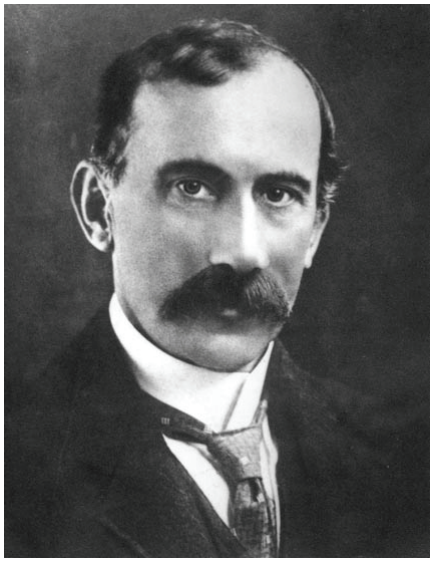
Schick, A 2005, *The Performing State: Reflection on an idea whose time has come but whose implementation has not*, paper prepared for the 4th OECD-Asian Senior Budget Officials Meeting, Bangkok.

Ter-Minassian, T and Fedelino, A, 2007, *Does Fiscal Decentralization Help Create Fiscal Space?*, Background paper prepared for the G-20 Workshop on Fiscal Policy, Istanbul.

William Higgs: senator and treasurer

John Hawkins[1]

A printer who rose to publish and edit newspapers, William Higgs served in the Queensland parliament and the Senate before taking a seat in the House of Representatives and becoming Treasurer in Billy Hughes' wartime Labor government. Higgs was arguably the most radical politician to hold the post, but Hughes' singular focus on the war limited Higgs' scope to make broad social reforms. He was an early advocate of the independence of the Commonwealth Bank.



Source: National Archives of Australia: A8120, 4.

1 The author was formerly in the Domestic Economy Division of the Australian Treasury. Scott Bennett assisted with the box. The views in this article are those of the author and not necessarily those of the Australian Treasury.

Introduction

William Guy Higgs had a mind described as 'disciplined rather than vivid and original'[2] and his voice was like 'distilled sorrow'.[3] He was 'not eloquent but a logical, clear, incisive speaker' which made him a persuasive agitator and a 'clever questioner' in select committees.[4]

A contemporary recalls him as 'tall … with black hair and swarthy skin … [like] an Italian conspirator of the middle ages'.[5] He generally dressed in black, and had a drooping moustache, which along with his serious mien, earned him the nickname 'the undertaker'. A fellow senator recalled him as 'a tall, sedate man with a very serious cast of countenance which quite belied his fiery disposition.'[6] A contemporary journalist said 'his chief possession is a bitter tongue and a stock of moral courage'.[7] But he also had a sense of humour.[8] This extended to some controversial practical jokes such as hiding the parliamentary mace.[9]

Higgs' life before politics

Higgs was born in Wingham, NSW, on the Manning River, on 18 January 1862, the eldest son of a Cornish storekeeper and his Irish wife. The family moved to Parramatta and then Orange, where at 13 Higgs left school and was apprenticed with the *Western Advocate*. Like a number of Labor figures, most notably Chris Watson, Higgs worked as a compositor. He continued this trade when he moved to Sydney, until in 1886 he became the full-time secretary of the NSW Typographical Association.

A renowned radical, Higgs was said to have coined the expression 'socialism in our time'.[10] Appearing before a royal commission on strikes, he advocated 'the state should be the sole employer of labour … and provide everything, all the necessities of life and all the comforts'.[11] Higgs was not just mouthing slogans: he provided the commission

---

2 Anonymous columnist in *Punch* (Melbourne), 6 April 1905, p 436.
3 Gibbney (1983, p 291).
4 Campbell-Jones (1935, p 409); *Punch*, 6 April 1905, p 436.
5 Campbell-Jones (1935, p 409).
6 George Pearce (1951, p 129).
7 *Punch* (Melbourne), 4 June 1914, p 956. The columnist went on admire his tactical abilities; 'he is an underground engineer of a high order, and takes care always to explode his mine at the most inopportune time for the other side'.
8 Pearce (1951, p 129) tells the story of how during a tariff debate with Senator Pulsford , who referred to him as 'Senator 'Iggs', Higgs said he had no objection to Pulsford trying to cut duties by 20 per cent, but 'is he in order by continually reducing my name by 20 per cent?'
9 Souter (1988, p 134).
10 Gibbney (1983, p 291).
11 Cited by Walsh (2000, p 96).

with an informed analysis of Marxism and a history of the English Poor Laws and Factory Acts. He not only championed the interests of working men but also women and the aged. Initially opposed to Federation, by 1899 he enthusiastically supported it.

In 1889 he resigned as union secretary and with a fellow unionist formed the printing firm Higgs & Townsend. They published a labour weekly newspaper, the *Trades and Labor Advocate*, and supported the establishment of a Labor party. On 18 April 1889 he married Mary Ann Knight and they were to have three children.

Senator

Higgs was selected as Labor candidate for the NSW Legislative Assembly seat of South Sydney in 1891 but was defeated at the election. In 1893 he moved to Brisbane as editor of the *Worker* and its circulation flourished under Higgs' leadership.[12] He began a rapid political ascent. He was elected to the Brisbane City Council in February 1899 and later that year, on his second attempt, won the Queensland Legislative Assembly seat of Fortitude Valley. His exposure of an attempt to bribe him to support a government bill won him favourable publicity.[13]

In March 1901 he was elected as a senator to the first federal parliament, topping the poll in his state. Higgs successfully served as chairman of committees[14] and was a member of the royal commission on the tariff. Long 'a fanatical believer in protection,'[15] he was an early supporter of 'new protectionism'.[16]

At Labour's 1902 conference Higgs moved to establish a 'Commonwealth Bank of deposit and issue'. In 1904 Higgs suggested Watson form an alliance with Deakin. He was also an advocate of dividing Queensland to form new states from the central and northern regions.

Higgs was defeated in 1906. He supported himself as an auctioneer in Sydney and later director of the Sydney branch of the Queensland Intelligence and Tourist Bureau.

---

12 The previous editor had been the well-known radical writer William Lane who had headed off to found the socialist 'New Australia' settlement in Paraguay. Under Higgs, *The Worker* campaigned hard on the 'sinister interest' of the Queensland National Bank and its dubious links with the conservative government, in time being vindicated by an official investigation; Dalton (1961, pp 34-8).

13 Dalton (1961, pp 21-2).

14 According to a contemporary columnist, he 'won golden opinions from both sides and was spoken of as a future president of the Senate'; *Punch*, 4 June 1914, p 956.

15 Pearce (1951, p 129).

16 Hansard, 23 May 1901, p 252.

Treasurer

Higgs won the seat of Capricornia in the Labor landslide in April 1910. His status within the party was shown by his selection as part of the parliamentary delegation to the coronation of George V in 1911. After Labor was defeated in 1913, Higgs challenged Fisher for the leadership, representing the more radical wing of the Party, but was defeated 42-18.[17] He then topped the first ballot for the executive positions.[18]

When Andrew Fisher retired as treasurer and prime minister in October 1915, the new prime minister Hughes attempted a restructure to keep Treasury, Attorney-Generals and External Affairs under the prime minister, but his ministers would not stand for it. Hughes then appointed Higgs as treasurer.

Higgs did not present the 1915-16 Budget until 9 May 1916. In his speech he estimated national private wealth at £1 billion and national income at £0.2 billion, based on the war census. He advised the people to save more given the likely fall in employment at the end of the war.

Higgs was a long-term advocate of an independent Commonwealth Bank. While Treasurer he opposed the suggestion that the Bank and government ministers or departments be in the same building; 'the nearer the Bank gets to the government, the greater the danger of the exercise of political influence in the management of the Bank'.[19] Higgs urged that O'Malley's contribution to the establishment of the Commonwealth Bank be acknowledged by the inscription of his name at the head office.[20]

After being treasurer

Higgs resigned as Treasurer in October 1916 as Labor split over conscription. This was a wrench for him. As he later put it, 'in resigning the Commonwealth Treasurership I sacrificed a position which I regarded as a great privilege and a distinguished honour. I loved the work.'[21] The position was left unfilled for two weeks (box).

---

17 Higgs was still a radical at this time, arguing in Higgs (1914) for 'collective ownership'.

18 This was not reported by the contemporary press but appears in the caucus minutes; Weller (1975a, pp 322-6). Higgs was described as a 'certainty for selection to any new federal Labour ministry' and a possible future leader; *Punch*, 4 June 1914, p 956.

19 Letter to King O'Malley 17 August 1916, O'Malley Papers, National Library of Australia MS 460/3899. Over twenty years later, in Higgs (1938) he called for its board to be comprised of a high court judge, professor of economics, and three former bank managers, only able to be removed by a vote of both houses of parliament.

20 Gollan (1968, p 99).

21 Higgs (1938, p 7).

Box: The mystery of the missing Treasurer

When Higgs resigned as Treasurer on 27 October 1916, Hughes was too preoccupied with trying to hold onto power to appoint a replacement, but did not assume the post himself either.

Smith (1933, p 178) remarks 'the government remained without a treasurer for several days' after Higgs resigned. This is supported by a contemporary story in *The Age* (6 November 1916) complaining that 'the Federal Treasury is without a political head at this most critical period, when millions of pounds are being spent with the speed and facility with which thousands were expended in the pre-war period.'

Treasury (2001) is incorrect in assuming that Alexander Poynton had taken over immediately. Poynton was not appointed until 14 November. The 18-day interregnum has been the only time since Federation the position of treasurer has been unfilled.

In July 1917 Higgs became chairman of the Labor caucus' treasury and finance committee and in June 1918 served as Labor's acting deputy leader.[22] Higgs was seen by some as a likely leader, given he was the most experienced Labor minister, after an ailing Tudor lost his second election in 1919 but the party preferred to stay with Tudor.[23] By now Higgs' radical ardour had cooled and many of his friends had left the party. In 1919 he supported Hughes' referendum to expand federal government powers over industry and commerce in defiance of the Labor Party's stance, criticised some party officials and urged coalition with the Country Party. In January 1920 he was expelled from the Labor Party and after sitting as an independent for some months in September joined the Nationalists. His parliamentary career ended when he was defeated as a Nationalist candidate at the 1922 election by Labor's future short-term prime minister Frank Forde. His last political involvement was chairing a royal commission into the effect of Federation on the finances of Western Australia in 1929.

22 Weller (1975b, pp 33 and p 68).
23 Murphy (1975).

Higgs retired to Kew and became a Christian Science practitioner. By now the former radical was often expressing very conservative views.[24] But there were still some progressive causes which moved him. He became an active president of the Society for the Welfare of Mental Patients and in Higgs (1930) wrote feelingly of their plight.

He passed away at Kew on 11 June 1951, a day before he had hoped to attend the 50th anniversary of parliament dinner, and the day before Ben Chifley's death.[25]

24 In Higgs (1941) he advocates religious education to prevent adultery on the grounds that 'in these days of modern flats and labour-saving devices, foolish young wives with time on their hands can easily fall victim to young and old men' and opposes the teaching of evolution.

25 By the time of Higgs' death, Billy Hughes, King O'Malley and George Pearce were the only other survivors from the first federal parliament.

References

Campbell-Jones, H 1935, 'A cabinet of captains: the romance of Australia's first federal parliament', unpublished typescript, National Library of Australia MS 8905.

Dalton, J 1961, 'The Queensland Labour movement 1889-1915', BA thesis, University of Queensland.

Gibbney, H 1983, 'Higgs, William Guy (1862-1951)', *Australian Dictionary of Biography*, vol. 9, Melbourne University Press, pp 291-2.

Gollan, R 1968, *The Commonwealth Bank of Australia: Origins and Early History*, ANU Press.

Higgs, W 1914, 'A contrast and an impeachment', Lewis McDonald, Brisbane.

Higgs, W 1930, *What Can Happen to a Man*, Ruskin Press, Melbourne.

Higgs, W 1938, 'Open letter to the electors of Australia entitled the Commonwealth Bank of Australia', HE Kuntzen, Melbourne.

Higgs, W 1941, 'What must I do to be saved', address at the Australian Church, Melbourne 20 April.

Murphy, D 1975, *T J Ryan: a Political Biography*, Queensland University Press.

Souter, G 1988, *Acts of Parliament*, Melbourne University Press.

Treasury 2001, *The Centenary of Treasury, 1901-2001*.

Walsh, K 2000 'Higgs, William Guy', in Millar, A (ed) *Biographical Dictionary of the Australian Senate*, Melbourne University Press, pp 95-9.

Weller, P (ed) 1975 *Caucus Minutes 1901-1949, volumes 1*, 2 Melbourne University Press.

What's new on the Treasury website

The Treasury's website, www.treasury.gov.au, includes past issues of the *Economic Roundup*. Some of the other items posted on the website since the previous issue of *Roundup* that may be of interest to readers are listed below.

Working paper

2008-01: 'Structural effects of a sustained rise in the terms of trade' (July 2008)

http://www.treasury.gov.au/contentitem.asp?NavId=035&ContentID=1400

Adam McKissack, Jennifer Chang, Robert Ewing and Jyoti Rahman

While previous terms of trade booms have tended to be short lived, there are reasons to believe that the current boom could be more enduring. This paper considers the implications for the Australian economy in the event that recent rises in the terms of trade are sustained, with a focus on labour market, industry and regional implications.

Thus far, the economy's reactions to the terms of trade boom have largely matched the predictions of economic theory: incomes, employment and investment have risen, in particular for mining and resource-rich States. However, we have not seen so called 'Dutch disease' effects as strongly as could be expected in the manufacturing industry and other traded parts of the economy.

Adjustments to the boom have thus far taken place in a position of less than full employment, so the resources sector has to date been able to utilise previously unemployed factors of production rather than simply attract factors from other sectors of the economy. Going forward, expanding labour supply in the resource rich regions of the country will be a central policy challenge.

If well managed, the transition to a higher terms of trade presents an opportunity to raise Australian living standards. But the challenges in ensuring a successful transition are significant and will test our policy frameworks in ways they have not been tested before.

Review

'Australia's Future Tax System' (August 2008)

http://www.treasury.gov.au/contentitem.asp?NavId=035&ContentID=1405

On 13 May 2008 the Australian Government announced the review of Australia's tax system. The review will look at the current tax system and make recommendations to position Australia to deal with the demographic, social, economic and environmental challenges of the 21st century. The review will encompass Australian Government and State taxes, except the GST, and interactions with the transfer system. The first report released by the Review Panel is entitled 'Architecture of Australia's Tax and Transfer System' and was released on 6 August 2008.

Consultations

http://www.treasury.gov.au/content/consultations.asp?ContentID=1013&titl=Reviews,%20Inquiries%20%26%20Consultations

Treasury conducts many consultations on behalf of the Government. The following consultations are open for public comment:

- Exposure Draft of the Corporations Amendment (Short Selling) Bill 2008
- Issues Paper — Unit Pricing
- Discussion Paper — Creeping Acquisitions
- Interest Withholding Tax — Extension of Eligibility for Exemption to State Government Bonds
- Review of Non-Forestry Managed Investment Schemes
- Fringe Benefits Tax — Jointly Held Assets
- Draft Legislation to Reform Division 6C of the Income Tax Assessment Act 1936
- Thin Capitalisation: Amendments to the Application of Accounting Standards — Public Consultation
- Taxation of Financial Arrangements — Stages 3 & 4
- Australia's Future Tax System

Sources of economic data

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

International economy	
Output, current account balance and interest rates	OECD Main Economic Indicators
Consumer price inflation	ABS cat. no. 6401.0
National accounts	
Components of GDP, contributions to change in GDP	ABS cat. no. 5206.0
Incomes, costs and prices	
Real household income	ABS cat. nos. 5204.0 and 5206.0
Wages, labour costs and company income	ABS cat. nos. 5204.0, 5206.0 and 6345.0
Prices	ABS cat. nos. 6401.0 and 5206.0
Labour market	ABS cat. no. 6202.0
External sector	
Australia's current account, external liabilities and income flows	ABS cat. nos. 5368.0, 5302.0 and 5206.0

Past editions of *Economic Roundup*

A full index to articles published in *Economic Roundup* was included in the Spring 2006 edition. Details of articles published in recent editions are listed below:

Issue 2, 2008

Alternative methodologies for projecting defence spending

Investment in East Asia since the Asian financial crisis

Revisiting the policy requirements of the terms-of-trade boom

Australia's experience in the sub-prime crisis

The economic outlook

Key themes from the Treasury Business Liaison Program — February 2008

Andrew Fisher: a reforming treasurer

Summer 2008

Venture capital in Australia

Measuring entrepreneurship

A perspective on trends in Australian Government spending

Australian household net worth

William Lyne: social reformer

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