

# AGENDA

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## A Journal of Policy Analysis and Reform

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Volume 17, Number 2, 2010

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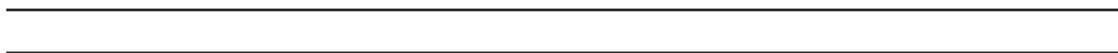
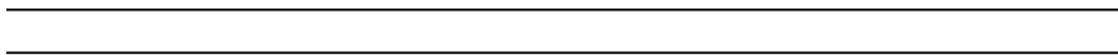
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# *ANALYSIS*





# Did Australia's Fiscal Stimulus Counter Recession?: Evidence from the National Accounts

ANTHONY J. MAKIN<sup>1</sup>

## Abstract

*A close scrutiny of the pattern of aggregate expenditure recorded in the Australian national accounts reveals it was the behaviour of exports and imports, and not increased fiscal activity, that was primarily responsible for offsetting the fall in private investment due to the Global Financial Crisis. The examination of a broad set of national income and employment indicators suggests that the Australian economy most likely did not avoid a recession, even though it was a relatively mild one by past standards.*

## Introduction

To counter a recession that was widely predicted in the wake of the Global Financial Crisis (GFC), the Australian government implemented one of the largest fiscal responses in the world in 2008–09 (IMF 2009). This was despite the relative soundness of Australia's banks compared to those in far worse-affected North Atlantic economies, whose systemic banking problems precipitated the GFC.

Extra Federal spending was unveiled in a series of fiscal packages, beginning with the Economic Security Strategy in October 2008 (\$10.4 billion), the Nation Building package in December 2008 (\$4.7 billion), the Nation Building and Jobs Plan in February 2009 (\$41.5 billion) and further Nation Building infrastructure measures in the May 2009 Federal budget (Uren and Taylor 2010: 249–50).

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This fiscal stimulus involved a mix of income transfers to select groups, as well as new public expenditure on different forms of infrastructure, including school construction and refurbishment, social housing, home insulation and limited tax breaks for business. It aimed to stimulate aggregate demand through increased consumption and investment expenditure and has been credited with saving Australia from recession (Australian Treasury Budget Papers 2010).

More specifically, the claim that Australia avoided recession, based on a definition of recession as two consecutive quarters of declining real GDP, turns on the positive real GDP result recorded for the March 2009 quarter, after the originally published negative December 2008 outcome. On the grounds that fiscal stimulus saved Australia from recession, former Prime Minister Kevin Rudd reportedly suggested that the day the Australian Bureau of Statistics released the March quarter national accounts data, 3 June 2009, was the best day of his prime ministership (Uren and Taylor 2010: 205).

However, two key data-related questions about the performance of the Australian economy at that critical time still need to be addressed. The first is how effective fiscal stimulus was in avoiding a recession, defined as two quarters of negative growth. The second is whether the economy did actually avoid a recession in light of a broader set of national accounts and labour-market indicators.

This paper aims to address these questions by thoroughly examining the latest quarterly national accounts data published by the Australian Bureau of Statistics (ABS Catalogue 5306.0) for the interval from September 2008 to December 2009. Close scrutiny of the pattern of aggregate expenditure recorded in the national accounts, especially for the December 2008 and March 2009 quarters, reveals it was the behaviour of exports and imports, not increased fiscal activity, that was primarily responsible for offsetting the fall in private investment due to the GFC. However, the size and sign of the statistical discrepancy in the national accounts implies that the expenditure-based GDP estimates need to be interpreted cautiously.

Next, the paper contends that when assessed with reference to a broader set of national income and employment indicators, as is standard practice for dating recessions in the United States, the Australian economy most likely did not avoid a recession, even though it was a relatively mild one by past standards.

## What National Accounts Data Tell Us About the Fiscal Stimulus

Historically, swings in private investment, rather than in household consumption, have been the main driver of Australia's business cycle because consumption tends to be relatively stable in the face of temporary income shocks, consistent with so-called consumption smoothing behaviour. Fiscal stimulus measures aimed to offset a fall in private investment, which initially manifested predominantly as a rundown in inventories, by boosting domestic consumption and public investment expenditure.

The GFC and its immediate aftermath most affected the Australian economy in the September 2008, December 2008, March 2009 and June 2009 quarters. Over this time many other economies experienced sharp falls in GDP and were party to what the International Monetary Fund termed 'The Great Recession' in 2008–09. What do the data for Australian GDP record?

The ABS publishes GDP series on an 'original', 'seasonally adjusted', and 'trend' basis, and recommends the 'trend' series for policy analysis. Although there are many interpretations of the term 'trend', in the context of national accounts analysis the Australian Statistician uses this term to refer to the underlying path traced by the *cyclical* behaviour of the series. Thus the 'trend' is *not* an average that smooths out cyclical disturbances. Technical discussion of the statistical techniques used to derive the national accounts trend series, which can differ significantly quarter by quarter from original and seasonally adjusted data, are discussed at length in ABS (2003).

Consistent with the recommendation in that publication and the emphasis the ABS itself gives in its commentaries in national accounts releases, GDP trend data are used in what follows, except when discussing the contribution of expenditure types to quarterly changes in GDP, which is published only on a seasonally adjusted basis. For the time interval under scrutiny, it is noteworthy that the seasonally adjusted national accounts data, when not separately included in data tables to follow, do tend to show that the economy performed worse than indicated by the trend series. Table 1 includes the main GDP series for Australia over this time, with deteriorations in quarterly changes recorded in boldface.

**Table 1: Conventional Measures of Gross Domestic Product (percentage growth per quarter, trend basis)**

	Real GDP- Expenditure	Real GDP- Income	Real GDP -Production	Real GDP- Average	Real GDP per capita	Nominal GDP
Jun-2008	0.3	0.3	0.7	0.4	0.1	2.8
Sep-2008	0.1	-0.2	0.2	0.0	-0.5	2.1
Dec-2008	0.4	-0.2	-0.2	0.0	-0.5	0.6
Mar-2009	0.7	0.2	-0.2	0.2	-0.3	-0.8
Jun-2009	0.9	0.5	0.1	0.5	0.0	-0.7
Sep-2009	0.9	0.5	0.6	0.6	0.2	0.7
Dec-2009	0.8	0.6	0.9	0.8	0.3	2.2

Source: Australian Bureau of Statistics, *Australian National Accounts*, Catalogue 5306; available at [www.abs.gov.au/Ausstats](http://www.abs.gov.au/Ausstats)

The first three columns record GDP by the national expenditure GDP(E), national income GDP(I) and national production GDP(P) methods. In principle, of course, the value of the conventional GDP measure for any quarter should have the same value, regardless of whether it is based on expenditure, income, or production. Yet, in practice, these three different approaches to GDP typically yield quite different results as a result of measurement problems.

For this reason, they are averaged by the ABS, with the size of the statistical discrepancy for any single measure reflecting the difference between that measure and the average of all three. The quarterly change in the average GDP measure, GDP(A), in trend terms was positive, at 0.2 per cent in real (or volume) terms for the March 2009 quarter following zero growth in the December quarter, implying that a recession, as defined above, was technically avoided.

Of notable interest, however, is the behaviour of nominal GDP, which fell in the March 2009 and June 2009 quarters, implying a contraction in national income. The reason the average volume measure of GDP remained positive in the March quarter, while the current price value measure shrank, is that there was a sharp fall in the implicit price deflator (or overall price level), due in no small part to heavy retail discounting of goods for sale at this time. Meanwhile, real GDP per head, the single most important indicator of recession, fell successively over three quarters by a total of 1.3 per cent.

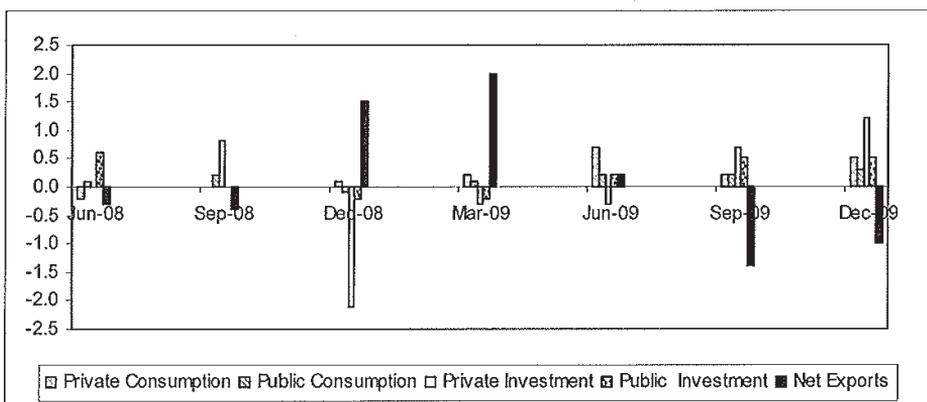
The real GDP(E) measure in Table 1 is the only conventional GDP series that did not record at least two consecutive negative outcomes. Average real GDP was not negative for two successive quarters because the GDP(E) measures were sufficiently positive to make GDP(A) positive. Hence, the claim that fiscal

stimulus enabled Australia to avoid recession according to the media definition of recession, in the end depends on the nature and robustness of the real GDP(E) measure for the March 2009 quarter.

Advocates of fiscal stimulus would argue that a high GDP(E) outcome should be unsurprising since the explicit purpose of fiscal stimulus is to expand aggregate expenditure. The issue which then arises, however, is whether Federal fiscal stimulus measures were mainly responsible for achieving the high and discrepant GDP(E) result for the March 2009 quarter. Put differently, how successfully did fiscal activity achieve this objective with reference to the contributions of consumption and investment to expenditure between the June 2008 and December 2009 quarters?

To answer this question, it is necessary to scrutinise the GDP expenditure data during the GFC impact period in more detail, paying particular attention to the main expenditure components — private consumption, public consumption, private investment, public investment, exports and imports. In the national accounts, quarter- to-quarter impacts of these expenditure items in seasonally adjusted terms are termed 'contributions to growth', the magnitude of which over the relevant time span are depicted in Figure 1.

**Figure 1: Contribution to Change in GDP by Expenditure**



Source: Australian Bureau of Statistics, *Australian National Accounts*, Catalogue 5306; available at [www.abs.gov.au/Ausstats](http://www.abs.gov.au/Ausstats)

With reference to the December 2008 and March 2009 quarters, what is apparent is that by far the most significant contributor to GDP(E) in those quarters was net exports, which detracted from real expenditure growth in quarters before and after the GFC struck. The strong net export result can be explained by a sustained real exchange-rate depreciation of over 25 per cent in trade-weighted terms during the December 2008 and March 2009 quarters, which made exports

substantially cheaper for foreign buyers and imports more expensive for domestic buyers. There was also sustained demand for commodities from key Asian trading partners, including China, over this time.

A sizeable component of the fiscal stimulus packages implemented during the GFC period focused on cash bonuses to individuals, which were intended to raise household income and hence private consumption indirectly. Private consumption did increase minimally in the March 2009 quarter, to 0.2 per cent, after contributing 0.1 per cent in the December 2008 quarter. However, given the dramatic lowering of official interest rates and substantial discounting of retail merchandise over this period, the size of the impact of the Federal cash bonuses, a major part of the fiscal-stimulus strategy, is open to question.

At most, cash bonuses are only likely to be responsible for a fraction of the small private consumption turnaround. This pales in comparison with the net exports contribution, and is less than the private investment improvement in the March quarter. In turn, this private investment improvement was due to a significant reversal of inventory rundown, in large part due to increases in farm inventory arising from a breaking of the drought.

**Table 2: Contributions to GDP Growth (percentage points per quarter, seasonally adjusted)**

	Federal Government Consumption	State and Local Govt Consumption	Federal Government Investment	State and Local Govt Investment	Statistical Discrepancy	Real GDP
Jun-2008	0.0	0.1	0.3	0.3	-0.1	0.2
Sep-2008	0.1	0.1	-0.2	-0.1	-0.1	0.4
Dec-2008	-0.1	0.1	-0.2	-0.1	0.0	-0.7
Mar-2009	0.0	0.1	-0.1	0.0	-0.9	0.7
Jun-2009	0.0	0.1	0.0	0.1	-0.3	0.5
Sep-2009	0.2	0.1	0.0	0.2	-0.1	0.3
Dec-2009	0.3	0.1	0.2	0.3	0.0	1.0

Source: Australian Bureau of Statistics, *Australian National Accounts*, Catalogue 5306; available at [www.abs.gov.au/Ausstats](http://www.abs.gov.au/Ausstats)

Of course, fiscal stimulus also involved direct government spending. Table 2 provides a more detailed breakdown of the respective contributions, on a seasonally adjusted basis, by level of government to consumption and

investment spending over the period affected by the GFC and its aftermath. The recorded contribution from direct Federal government consumption to a change in GDP(E) in the December 2008 quarter was *actually negative* (-0.1 per cent), followed by nil contribution in the March quarter. These were offset by negligible positive contributions from State and Local consumption spending.

Similarly, Federal public investment *actually contributed negatively* to total expenditure over the critical December 2008 and March 2009 quarters, being -0.2 and -0.1 respectively, as did public investment by State and Local governments. As a result of administrative delays in implementing infrastructure spending, total public spending did increase by the end of 2009, but only after the worst of the GFC had passed, and then arguably crowded out private investment spending at the time.

These delays accord with numerous empirical studies of discretionary fiscal expansion in advanced economies, which tends to impact well after economic downturns begin. For instance, in a study of G7 economies for the period 1980 to 2007, IMF economists Leigh and Stehn (2009) conclude that fiscal stimulus in the form of capital spending arrived on average around a year after the onset of a downturn. This is consistent with earlier studies by Auerbach (2003), Galí and Perotti (2003) and Lane showing that in practice fiscal stimulus in the past has been either weakly countercyclical or procyclical in OECD economies.

To summarise, the main expenditure items from the national accounts contributing to GDP(E) for the March 2009 quarter can be expressed as:

$$\begin{aligned}
 & \textit{Private Consumption (0.2\%)} + \textit{Public Consumption (0.1\%)} \\
 & \quad + \textit{Private Investment (-0.5\%)} \\
 & + \textit{Public Investment (-0.2\%)} + \textit{Net Exports (2.0\%)} + \textit{Statistical Discrepancy (-0.9\%)} \\
 & \quad = \textit{GDP (0.7\%)}
 \end{aligned}$$

Thus, the net positive contributions of private and public consumption totalling 0.3 per cent were insufficient to offset the negative contributions from private and public investment (inclusive of inventory changes) of 0.7 per cent, and were minor in relation to the contribution from net exports of 2.0 per cent.

It is also important to note that, at -0.9 per cent, the statistical discrepancy between the GDP(E) measure and the GDP(A) measure in the March 2009 quarter was very large by historical standards. This suggests an overstatement of measured expenditure relative to measured production. Given the magnitude of this discrepancy, it raises serious doubts about the robustness of the GDP(E) series for the March quarter. Yet, this particular GDP series is central to achieving the positive real GDP(A) result that justifies the claim that Australia avoided recession at that time.

## Did Australia Avoid Recession in 2008-09?

The claim that Australia avoided a recession rests on the definition of recession as two consecutive quarters of falling GDP. This definition is popular with media commentators and market economists and is tacitly approved by the Australian Treasury and the Reserve Bank of Australia. However, it lacks support from academic economists and policymakers abroad. Disapproval of this narrow and somewhat arbitrary interpretation of recession is expressed in numerous mainstream macroeconomics texts, including one co-authored by Ben Bernanke, Chairman of the United States Federal Reserve (Abel, Bernanke and Croushore 2007).

Relying on just one indicator of macroeconomic activity, such as real GDP, is inappropriate because economy-wide data estimation is always subject to a margin of error, especially in the face of a major shock such as the GFC, as evidenced by large statistical discrepancies in the national accounts. As shown above in Table 1, two successive quarters of negative growth *were* recorded in nominal GDP, the real production and income-based measures of GDP, and real GDP per head. The real GDP(E) measure was the only series that did not fall over two successive quarters.

For decades in the United States a panel of independent economists under the auspices of the National Bureau of Economic Research has declared and dated recessions with reference to a battery of economic indicators, not just conventional real GDP series. Using a broader set of macroeconomic data series than the standard real GDP(A) measure is warranted in Australia as well, and a range of national income measures with subtle differences in meaning is available for this purpose.

Alternative national income series for Australia gleaned from the most recent set of national accounts are included in Table 3, all of which reveal at least two successive negative quarterly outcomes. Though routinely ignored in economic commentary, the real gross and net domestic and national income series are especially important measures of Australia's international macroeconomic performance because they reflect the impact of the terms of trade (or ratio of prices received for exports to prices paid for imports) on the economy.

**Table 3: Other National Income Measures (percentage growth per quarter, trend basis)**

	Real Net Domestic Product	Real Gross Domestic Income	Real Gross National Income	Real Net National Disposable Income	Real Net National Disposable Income per Capita
Jun-2008	0.3	2.2	2.5	2.7	2.2
Sep-2008	-0.3	1.2	1.6	1.5	1.0
Dec-2008	-0.4	-0.3	-0.2	-0.5	-1.1
Mar-2009	-0.1	-1.2	-1.2	-1.8	-2.3
Jun-2009	0.4	-0.5	-0.6	-1.0	-1.5
Sep-2009	0.5	0.3	0.3	0.1	-0.3
Dec-2009	0.4	0.7	0.7	0.6	0.2

Source: Australian Bureau of Statistics, *Australian National Accounts*, Catalogue 5306; available at [www.abs.gov.au/Ausstats](http://www.abs.gov.au/Ausstats)

Derived by adjusting the volume measure of GDP for changes in the international purchasing power of national income which, in Australia's case, occurs due to fluctuating export commodity prices, these series are broader measures of national economic wellbeing than the standard real GDP measure used in the media definition of recession. Specifically, real gross domestic income, consistent with the definition in the ABS Catalogue 5206.0 glossary, is derived as:

$$GDP(A) \text{ in constant prices} - \text{Exports in constant prices} + \text{Exports at current prices deflated by the Implicit Price Deflator for Imports.}$$

In other words, real GDP is adjusted by revaluing exports in terms of the implicit price deflator.

The differences between the measures Real Gross Domestic Income and Real Gross National Income and Real Net National Disposable Income in Table 3 reflect adjustments for capital consumption, and income remittances and transfers abroad. It is noteworthy that in 2008–09, all of these measures recorded their most significant falls since the recession of the early 1990s.

It is also appropriate to supplement the set of national income series in Tables 1 and 3 with aggregate labour-market data. Table 4 includes a selection of labour-market indicators which reveal that employment conditions unambiguously worsened over the interval under scrutiny. Consistent with historical experience, these indicators tended to lag the deteriorations in the GDP(P) and GDP(I) series over the GFC interval.

Most notably, hours worked fell by 1.3 per cent in the March quarter after a 1.1 per cent fall in the December quarter and by 3.2 per cent between the September 2008 and June 2009 quarters, whereas unemployment rose by 1.1 per cent and 1.5 per cent over these respective periods.

**Table 4: Labour-market Indicators (percentage growth per quarter, seasonally adjusted)**

	Hours Worked	Real GDP Market sector	Hours Worked Market Sector	Nominal Non-farm Compensation of Employees	Unemployment Rate
	%	%	%	%	%
Jun-2008	0.9	0.7	0.3	2.6	4.2
Sep-2008	0.3	0.0	-1.0	1.8	4.3
Dec-2008	-0.4	-0.7	-1.3	1.1	4.6
Mar-2009	-0.7	-1.1	-1.1	-0.2	5.7
Jun-2009	-0.4	0.4	-0.2	-0.5	5.8
Sep-2009	0.1	0.5	-1.2	0.2	5.7
Dec-2009	0.6	1.1	0.3	0.4	5.5

Source: Australian Bureau of Statistics, *Australian National Accounts*, Catalogue 5306; available at [www.abs.gov.au/Ausstats](http://www.abs.gov.au/Ausstats). Reserve Bank of Australia; available at [www.rba.gov.au/statistics](http://www.rba.gov.au/statistics)

Combining the above national income measures in Tables 1 and 3 with the labour-market indicators in Table 4 provides a more comprehensive picture of Australian macroeconomic conditions as a result of the GFC than that conveyed by the media definition of recession based on only one national accounts series. When worsening quarterly outcomes for a larger set of indicators are aggregated, a pattern emerges of an economy that failed to improve in the critical March 2009 quarter, not one that avoided recession, arbitrarily defined. Overall, however, the array of macroeconomic indicators suggests that the downturn was relatively mild by historical standards.

It should also be noted that these data, drawn mainly from the national accounts, are by no means an exhaustive set for assessing the business cycle. Including additional indicators (some leading, some co-incident, some lagging) for national wealth, building approvals, firms' profitability, retail sales and other activity measures would be expected to provide further evidence of a recession at this time.

When dating the duration of recessions in the United States, how long national income significantly deviates from trend growth, known as the growth-cycle measure of the business cycle, is also taken into account; see Hall and Taylor (1993). The growth-cycle approach defines recessionary intervals as those when activity persists below long-term trend growth, whereas the above national accounts series simply reflect levels of economic activity.

## Conclusion

The case for fiscal stimulus was based on the presumption that it would work along lines first proposed by Keynes (1936); that macroeconomic activity was demand-determined in the short run and that public spending could increase domestic aggregate demand. What this interpretation ignores, however, is the role that the nominal exchange rate can play in insulating the real domestic economy from the worst effects of a foreign financial shock via its stimulatory impact on net exports, as modelled more formally in Makin (2010).

Using raw data from Australia's national accounts, this paper establishes that net foreign demand (as reflected in quarterly changes in exports and imports), not federal fiscal stimulus, was primarily responsible for countering the GFC-induced economic slowdown over the December 2008 and March 2009 quarters. Indeed, the Federal government's direct contribution to the change in domestic consumption and investment was minimal at that time, with its major impact arriving several quarters after it was deemed necessary.

Considered in isolation, the somewhat arbitrary media measure of two successive quarters of declining real GDP provides a misleading picture of macroeconomic conditions. The statistical discrepancy, especially the discrepancy associated with the GDP expenditure measure, was very large by historical standards during the GFC period, suggesting a broader set of national income measures from the national accounts should be used.

Taken together, numerous national income measures and employment indicators suggest Australia, through no economic fault of its own, most likely experienced a mild recession by historical and international standards in 2008-09. Ideally, whether and when recessions do occur in Australia should depend on the comprehensive assessment and judgement of an independent panel of academic economists in the spirit of the approach practised in the United States.

## References

- Abel, A., Bernanke, B. and Croushore, D. (2007) *Macroeconomics* (6th edition) Addison Wesley, New York.
- Auerbach, A. 2003, 'Fiscal Policy: Past and Present', *Brookings Papers on Economic Activity*: 75-138.
- Australian Bureau of Statistics 2000, *Australian National Accounts: Concepts, Sources and Methods*, Catalogue 5216, Australian Bureau of Statistics, Canberra.

- Australian Bureau of Statistics 2010, *Australian National Accounts: National Income, Product and Expenditure*, Catalogue 5306, Australian Bureau of Statistics, Canberra.
- Australian Bureau of Statistics 2003, *A Guide to Interpreting Time Series: Monitoring Trends*, Catalogue 1349.0, Australian Bureau of Statistics, Canberra.
- Australian Treasury 2010, *Budget Papers 2010–2011*, Australian Government Printing Service, Canberra.
- Gali, Jordi and Perotti, Roberto 2003, "Fiscal Policy and Monetary Integration in Europe", *Economic Policy* 37: 533–72.
- Hall, R. and Taylor, J. 1993 (4th edition), *Macroeconomics*, Norton, New York.
- International Monetary Fund 2008, *World Economic Outlook*, September, IMF, Washington DC.
- International Monetary Fund 2009, *Global Economic Policies and Prospects*, Group of Twenty Meeting, March, IMF, Washington DC.
- Lane, P. 2003, "The Cyclical Behaviour of Fiscal Policy: Evidence from the OECD" *Journal of Public Economics* 87: 2661–75.
- Leigh, D. and Stehn, J. 2009, "Fiscal and Monetary Policy During Downturns: Evidence from the G7", IMF Working Paper WP/09/50, International Monetary Fund, Washington DC.
- Keynes, J. M. 1936, *The General Theory of Employment, Interest and Money*, Macmillan, Houndsmills, U.K.
- Makin, A. 2010, "How Should Macroeconomic Policy Respond to Foreign Financial Crises?" *Economic Papers* 29(2): 1–10.
- Mankiw, G. 2010, *Macroeconomics* (7th edition), Worth, New York.
- Reserve Bank of Australia 2010, *Statistical Tables*; available at <http://www.rba.gov.au/statistics/index.html>
- Taylor, L. and Uren, D. 2010, *Shitstorm*, Melbourne University Press, Melbourne.

# How to Increase the Cost-effectiveness of Water Reform and Environmental Flows in the Murray-Darling Basin

R. QUENTIN GRAFTON<sup>1</sup>

## Abstract

*The paper reviews the \$12.9 billion Water for the Future package in the Murray-Darling Basin from the perspective of cost-effectiveness and assesses the possible losses to irrigators from reduced diversions to achieve desired environmental-flow regimes. It argues that combining the \$3.1 billion allocated to buying water entitlements with the \$5.8 billion targeted by Water for the Future for water infrastructure subsidies into a purchase of water entitlements from willing sellers would maximise the water acquired for the environment per dollar of expenditure, provide greater assistance to holders of water entitlements, and reduce the expected gap between average water diversions for agriculture and sustainable diversion limits.*

## Introduction<sup>2</sup>

Water reform in the Murray-Darling Basin is at a crossroad. The *National Water Initiative* of 2004, the *Water Act* of 2007 (that empowers the Murray-Darling Basin Authority to set sustainable diversion limits for the entire Basin), and the *Water for the Future* package of 2008 worth \$12.9 billion (Lee and Ancev 2009) provide a unique opportunity to resolve environmental and structural problems decades in the making. Coincident with these reforms has been a decade-long

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<sup>2</sup> The helpful comments and assistance of Tim Stubbs of the Wentworth Group of Concerned Scientists, Daniel Connell and Qiang Jiang of the Australian National University, two referees and the Editor are much appreciated. Tables 1–3 are adapted from Grafton and Jiang (2010). All errors of omission and commission are attributable solely to the author.

drought in the southern part of the Basin that has reduced environmental flows proportionally more than declines in diversions by irrigators (Connell and Grafton 2008) and that has placed many environmental assets in a critical state (The Senate, 2008).

This paper focuses on the economics of water reform in the Murray-Darling Basin (MDB) and, in particular, the stated goal of the Commonwealth Government to achieve 'value for money' — defined in this paper as cost-effectiveness. It uses economic analysis to propose ways in which the stated reform goals of achieving environmentally sustainable levels of extraction can be delivered in a cost-effective way. It builds and extends on earlier reviews by Crase and O'Keefe (2008), Grafton (2007), Grafton (2010), and the Wentworth Group of Concerned Scientists (2010), among others, and also provides an analysis of the economic costs of reduced water diversions to irrigators.

The analysis of this paper shows that if the \$3.1 billion allocated to buying water entitlements and the \$5.8 billion targeted for water infrastructure subsidies under *Water for the Future* were combined to purchase water entitlements from willing sellers, the Commonwealth Government would be much more likely to achieve healthy working rivers within the Basin, and for no extra cost. Moreover, the budget available exceeds the losses to irrigators of reduced diversions in terms of both the estimated foregone profits and the possible costs of acquiring water entitlements.

## The State of the Basin

The Basin's two main rivers are the Murray, which has its source in the Victorian Alps and dominates the southern part of the Basin, and the Darling, which originates in Queensland and connects to the Murray at Wentworth in New South Wales. The Murray and its major tributaries in the southern part of the Basin are 'regulated' rivers in that there are large water storages that adjust the flow to increase water availability in the drier summer months. This regulation has assisted in the development of irrigated agriculture, which accounts for most of the total water extracted within the Basin. By contrast, in the north of the Basin many of the rivers lack large, public storages so river flows follow the pattern of actual inflows. However, farmers with appropriate water licences in the northern Basin also have the right to capture and store flows for their own use.

The northern and southern parts of the Basin differ in their rainfall patterns. The southern connected or 'regulated' part of the Basin receives most of its rainfall in the winter months, while the north, subject to cyclonic activity, receives about half of its inflows during the summer. Consequently the type of

irrigated agriculture differs across the Basin. Irrigation in the north, typically, is opportunistically based on the prevailing rain patterns (such as cotton production) while in the south, at least in the hotter and drier parts downstream, perennial irrigation (especially horticulture and viticulture) is based on reliably supplied water released from upstream dams.

## The People

Agriculture dominates the water use within the Basin, but it accounts for only 10 per cent of employment, or some 100,000 jobs. It does, however, represent a higher proportion of total employment in smaller communities. Such towns and rural localities are, typically, areas of greatest socio-economic disadvantage (Australian Bureau of Statistics, Australian Bureau of Agricultural and Resource Economics and Bureau of Rural Sciences 2009: 113–14).

About half of the population in the Basin lives in communities larger than 10,000, about a quarter in towns between 1000 and 9999 and the remainder, or a little over half a million people, live in rural localities or independently (Australian Bureau of Statistics 2008, chapter 2). It is these smaller communities and rural localities, with their greater dependence on irrigated agriculture and with less-diversified economies that will be most affected by the current water reforms.

## Irrigated Agriculture

The gross value of agricultural production in the Basin was some \$15 billion in 2005–2006, of which irrigated agriculture contributed about one-third of the total (Australian Bureau of Statistics 2008, chapter 4). While farming occupies 84 per cent of the total land area in the Basin, irrigated agriculture accounts for about 2 per cent of the total and, thus, generates much higher returns per hectare than dryland agriculture (Bryan *et al.* 2009).

Overall, there are about 18,000 farm businesses that irrigate within the Basin while the number of farming enterprises (dryland and irrigation) totals 61,000. Despite the recent drought, the gross value of irrigated agricultural production increased, in nominal terms, by 9 per cent between 2000–2001 and 2005–2006 (Australian Bureau of Statistics, Australian Bureau of Agricultural and Resource Economics and Bureau of Rural Sciences 2009: 58). In large part this is because of water trade that has allowed water to move from low- to higher-valued uses despite reduced water allocations to farmers.

## Water Diversions and Entitlements

Water diversions in the Southern Basin are managed from storages via controlled releases and natural inflows. Holders of water entitlements receive water allocations every season based on the amount of water in storages, expected inflows and other factors. These allocations are defined as a percentage of the nominal quantity of the water entitlement. Water entitlements have different levels of 'reliability', where higher-reliability entitlements receive their allocations before holders of lower-reliability entitlements within the same catchment. Water entitlements with 90 per cent reliability would expect to receive a full allocation 90 years out of 100. The quantity of water an entitlement holder would expect to receive is denominated by its long-term cap equivalent (LTCE) and this amount, rather than the nominal quantity of water assigned to an entitlement, is what is expected to be delivered, on average, in actual allocations of water.

In addition to allocating water to entitlement holders, States also provide 'planned' or 'rules-based' water to the environment under water-resource plans. This planned or rules-based water is, however, not a fixed entitlement because of the operational rules of water management. In many water-sharing plans, the proportion of rules-based water allocated to the environment declines with inflows to accommodate the needs of irrigators (Connell 2010). CSIRO (2008: 43) reports that in the highest water-use regions (Murray, Murrumbidgee and Goulburn-Broken) in the MDB there is a high degree of protection to water-entitlement holders, and thus low levels of protection for environmental flows, associated with reduced surface-water availability. As rules-based water is determined by States, allocations are based on the perceived needs and interests of the individual states rather than the needs and interests of the entire Basin. The discretionary nature of rules-based water has prompted the purchase of water entitlements by governments, especially the Commonwealth Government, to ensure volumes of water are available for environmental flows.

## Water Trade

Irrigators are able to buy and sell water entitlements, although restrictions are in place to limit sales outside of irrigation districts. Restrictions on sales of entitlements have been imposed with greatest effect in Victoria. In particular, Victoria has imposed a 4 per cent annual limit on the revocation of association between its water entitlements and land in an irrigation district.<sup>3</sup> Sales of

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<sup>3</sup> The ACCC (2009) notes that only Victoria and, to a lesser extent, New South Wales have implemented the 4 per cent rule via legislation. Until June 2009, when an exemption was granted to the Commonwealth Government, the rule also constrained the sale of water entitlements for environmental purposes. Administrative difficulties/barriers resulted in no interstate tagged water-entitlement trade in 2008–09.

seasonal allocation water, the water assigned each season to water entitlements, are also widely bought and sold and have fewer constraints on trade than water entitlements.

Water trade in the Basin has occurred since the early 1980s and rapidly increased following the freeing up of some restrictions on trade and the establishment of the 'Cap' in the mid-1990s that was intended to limit further growth in water diversions. Trade volumes have also increased in response to reduced inflows and low seasonal allocations. In 2008–09 there were over 1000 GL of water entitlements and over 1700 GL of water allocations traded in the southern connected MDB (National Water Commission 2009a: 5) that collectively represented about a quarter of long-term average surface-water extractions in the Basin. This water trade generates very substantial economic returns to irrigators (both buyers and sellers) and their farming communities: the value of water traded in 2008–09 was worth over \$2 billion.

## Drought

The past decade has witnessed a sharp drying trend in the southern part of the Basin, which provides, on average, about 80 per cent of the river flows of the MDB. The consequence of the decade-long drought, with extremely dry years in 2002–2003 and 2007–2008, is that irrigators have had to manage with much less water. For instance, in the driest years there have been large falls in the production of annual water-intensive crops, such as cotton and rice (Australian Bureau of Statistics, Australian Bureau of Agricultural and Resource Economics and Bureau of Rural Sciences 2009: 60–1), with negative impacts on communities dependent on these farming activities.

The drought has been caused by both reduced rainfall and higher temperatures. Flooding in 2009 and 2010 has ended the drought in the northern part of the Basin and close-to-average rainfall in 2009/2010 the southern Basin has reduced the demand for water extractions. Nevertheless, large water storages in the southern Basin (Dartmouth and Hume dams), as of June 2010, still remain well below their average levels.<sup>4</sup>

For the period 2002–2007, average annual net inflows in the Murray River totalled 3986 GL — the lowest recorded for a five-year period. By comparison, net inflows averaged 5501 GL over the drought period 1940–45 and 5707 GL

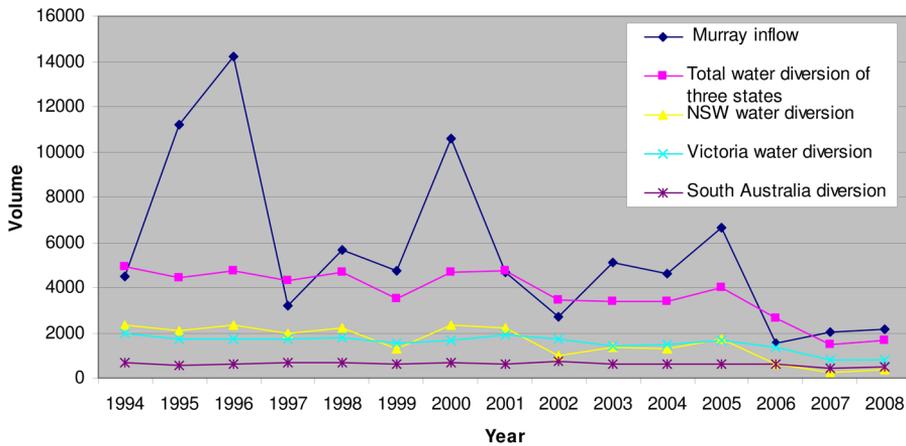
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There are also limitations on the rights held by irrigators because of the bundling of rights, and deficiencies in market information (volume and price of trades) that reduce the efficiency of water markets. From May until September 2009 New South Wales had an embargo on the sale of water entitlements for environmental purposes and from July 2009 imposed a temporary embargo on allocation trade outside of New South Wales.

<sup>4</sup> As of 2 June, 2010, total public storages in the Southern Basin were at 34 per cent of capacity. Details are available at <http://www.mdba.gov.au/water/waterinstorage/southern?run-date=2010-06-02>.

over the period 1897–1902 during the Federation Drought. In the recent past this has translated into much-reduced water diversions by irrigated farmers. It has also resulted in the proportion of inflows diverted for agriculture in the River Murray to increase from less than 50 per cent in the 1980s and 1990s to 76 per cent over the period 2000–2008 (see Figure 1).

**Figure 1: Murray River Net Inflows and Water Diversions 1994-2008 (GL per year)**



Source: Murray-Darling Basin Official Water System Database

Notes:

Net inflows are from the first column (Murray System Inflows — no Darling River or Snowy River inflows) in the Murray River inflows table.

Water use is the sum of Murray System diversions in NSW, in Victoria and South Australia.

Data is for the Murray River only and does not include other regions of the southern Murray-Darling Basin.

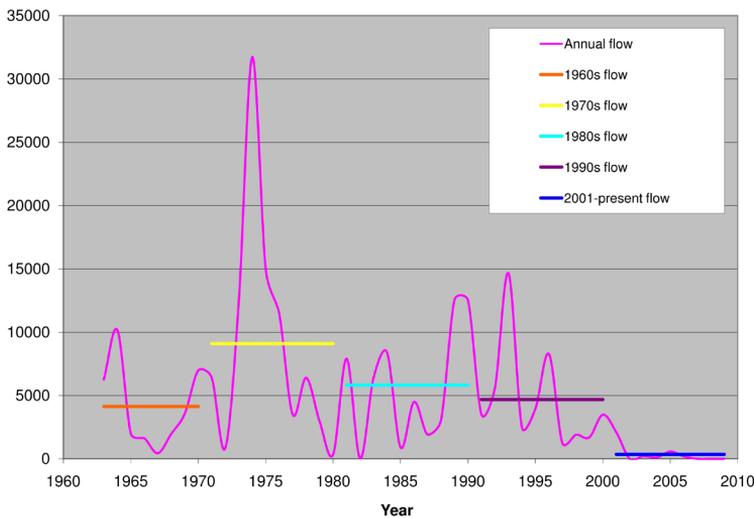
Less-than-proportional declines in water diversions by irrigators relative to inflows has arisen because ‘rules-based’ or ‘planned’ water for the environment is, typically, treated as a residual after allocations to water diversions (Connell 2010), and incurs a greater proportional reduction in volumes as inflows decline.<sup>5</sup> Suspension of several water-sharing plans in New South Wales in 2007, where the plans included specified volumes of water for the environment (Hamstead *et al.* 2008: xvi), exacerbated this problem.

5 The National Water Commission (2009b: viii) has expressed that it ‘...is increasingly concerned about the security of environmental water access entitlements and rules-based environmental water, particularly during drought. The Commission considers that water plans should clearly and transparently specify desired environmental outcomes and fully define environmental watering protocols to achieve them under all inflow scenarios (including sequences of dry years).’ CSIRO (2008: 32) also observes that ‘...in dry years when availability is low, a greater fraction of the available water is diverted for use.’

## The Environment

The recent drought has made it transparent that there is insufficient water flowing to key environmental assets to maintain them in a healthy state. The biggest impact is at the Murray Mouth at the end of the system as it has received virtually no flows in the past decade (see Figure 2). However, assets throughout the southern Basin are in major state of decline (The Senate 2008: 39). The root cause is that regulation of inflows has meant that flood events that would regularly occur within the Basin now happen only rarely, at least in the southern part of the Basin. It is these flood events that allow the ‘flushing out’ of salts harmful to plant growth and enable inundation to ensure bird- and fish-breeding events. Periodic flooding is also necessary to maintain healthy ecosystems, such as River Red gum forests.

**Figure 2: Flows at the Murray Mouth 1963-2009 (GL per year)**



Source: Murray-Darling Basin Official Water System Database

Flow is measured at the barrages near the Murray River Mouth.

These much-less-regular flood events and minimal flows during dry periods have also exposed acid-sulphate soils in substantial parts of the Basin that contribute to die-offs associated with high acidity. As a result, 20 of the 23 river valleys in the Basin are classified as being either in poor or very poor state of health (Davies *et al.* 2008).<sup>6</sup> Some of these assets have been described as being in a critical state, such as the Lower Lakes and the Coorong, and also River Red Gum forests (New South Wales Natural Resources Commission 2009).

<sup>6</sup> The report on the state of the rivers audit was released in 2008. Since its release there have been widespread floods in the northern Basin that should have contributed to improved catchment conditions.

## Review of Recent Water Reform

The past decade or so has witnessed major water-policy reforms and initiatives. Following agreement at the Council of Australian Governments (COAG), an interim Cap was placed on surface-water diversions in the Basin in 1995. This was viewed as a first-step measure to avoid further over-allocation and an increase in water diversions. The Cap, however, is based on historical water use and not on what may be environmentally sustainable.

A five-year review of the Cap in 2000 and ongoing concerns about the environment, popularised by a landmark report by the Wentworth Group of Concerned Scientists in November 2002, provided the stimulus for further reform.<sup>7</sup> It prompted governments to implement in 2004 the *Living Murray First Step Initiative* and the *National Water Initiative*. The *Living Murray* sought to acquire 500 GL of water for the environment by 2009, a goal it has now achieved, by improving water-use efficiency with infrastructure investments and the purchase of water entitlements (Grafton and Hussey 2007).

### National Water Initiative

A set of principles on water use and governance was agreed to by all governments in the Basin in 2004 in what is commonly called the *National Water Initiative* (NWI). For the first time, governments agreed to give primacy in water use to meeting the needs of the environment. It assigned a set of goals including the freeing up of water trade, nationally consistent and secure water entitlements in the Basin, and statutory water planning to achieve environmental, social and economic outcomes.

A key provision of the NWI is that water-entitlement holders are subject to the risk of changes in the 'reliability' of their entitlement. This risk is delineated under Sections 48 and 49 of the NWI. Beyond 2014, reductions in reliability in excess of 3 per cent of water allocations due to new knowledge or change in policies will be borne by governments. Importantly, water-entitlement holders are to bear the full risk of reductions in reliability due to changes in climate or drought.<sup>8</sup> To help implement the NWI, the National Water Commission was established to report on the state of water markets and progress towards all of the goals of the NWI.

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<sup>7</sup> This also coincided with a widely publicised program of dredging to keep the Murray Mouth open because of inadequate end-of-system flows.

<sup>8</sup> See Productivity Commission (2010: 109) for further details on the risk-assignment provisions of the *National Water Initiative*.

## Water Act 2007

Concerns about the lack of progress towards achieving the NWI, and State rivalries and inconsistencies in implementation, prompted the Commonwealth Government to legislate the *Water Act 2007*. This act represents the rules under which the Basin will be governed. A key aspect of the Act is the creation of the Murray-Darling Basin Authority (MDBA) that superseded the Murray-Darling Basin Commission. The MDBA is charged with developing and implementing a Basin Plan. The Basin Plan will be operational from July 2011 and will set sustainable diversion limits by catchment and for the entire Basin that will cap the 'take' or average surface and groundwater extractions.<sup>9</sup>

The Commonwealth Water Minister has the power under the Act to require State and regional water-resource plans to conform to the overall Basin Plan. However, States are not legally obliged to have their water-resource plans be consistent with the Basin Plan until State plans expire. In the case of New South Wales, these plans expire in 2014, but in Victoria existing plans remain in force until 2019. The Act was amended in 2008 to give additional responsibilities to the Australian Competition and Consumer Commission (ACCC) in the setting of market rules for the Basin and to specify arrangements for meeting critical human needs for water.

## Water for the Future

In March 2008, following a change in the Federal government, a third pillar of water reform — called *Water for the Future* — was announced, with a budget of \$12.9 billion to be spent over 10 years. It allocates \$5.8 billion for infrastructure subsidies under the rubric of Sustainable Rural Water Use and Infrastructure (SRWUI) programs. The stated intention of SRWUI is to deliver substantial and lasting returns for the environment *and* secure a long-term future for irrigation communities while delivering 'value for money' (DEWHA 2009). *Water for the Future* also includes a \$3.1 billion program for the purchase of water entitlements from willing sellers called Restoring the Balance (RTB). Its stated goal is to obtain water for the environment that represents 'value for money'. The Federal Water Minister has stated that the RTB program will also be used to '...ease the transition to lower diversion limits expected under the [Basin] Plan.' (Wong 2008) As of the end of 2009, over \$1.2 billion had been spent, or was in the process of being spent, to purchase approximately 800 GL of water entitlements, which translates into about 500 GL of long-term cap equivalent.

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<sup>9</sup> Sustainable diversion limits (SDLs) are to represent an environmentally sustainable level of take which, if exceeded, would compromise: (1) key environmental assets of the water resource; or (2) key ecosystem functions of the water resources; or (3) the productive base of the water resource; or (4) key environmental outcomes of the water resource.

*Water for the Future*, funded entirely by the Commonwealth Government, provides the means by which State priorities for water reform are realised. Financing these State priorities of at least \$3.7 billion out of the \$5.8 billion allocated for the SRWUI program, as detailed in the July 2008 Intergovernmental Agreement on Murray-Darling Basin Reform Agreement, was crucial in ensuring State acceptance of the jurisdictional reforms detailed in the *Water Act 2007* and its 2008 amendments. Thus, *Water for the Future* includes irrigator incentives to achieve desired goals for the Basin as well as subsidies for State priority projects to ensure the co-operation of Basin states for water reform.

## Economics of Water Reform

The ability of governments to alter course and improve current water reform is limited by past agreements and current budgets. This means that what might be recommended by economists if given a 'carte blanche' to undertake water reform is different from what can be done under existing governmental agreements and a fixed budget. In the carte-blanche scenario, a full cost-benefit analysis would be undertaken to consider all benefits and costs of public expenditures of various water reforms. In the 'constrained scenario' an economic analysis is restricted to promoting cost-effectiveness of the planned expenditures so as to maximise the benefits from the given budget.

This paper only evaluates the cost-effectiveness of the current reform, and suggests ways to progress the goals of water reform further with the same or lesser budget. Thus, this paper is *not* a cost-benefit analysis of water reform, but rather an evaluation as to how the Commonwealth Government can more effectively achieve its stated objectives of environmental sustainability and 'value for money' within its existing \$8.9 billion budget.<sup>10</sup>

Before evaluating *Water for the Future* it is important to list the key components of water reform that are treated as given when considering alternatives to current policy:

- A maximum of \$8.9 billion is available for either purchase of water entitlements for the environment or subsidies for water infrastructure;

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<sup>10</sup> Nevertheless, there is preliminary evidence that the benefits of current water reform may exceed the expected costs. For instance, Morrison *et al.* (2010) find that the total willingness to pay to improve the quality of the Coorong, at the Murray Mouth, that would increase the frequency of water-bird breeding from every 10 years to every seven years, raise native fish populations from 30 per cent to 40 per cent of original levels, and increase the area of healthy native vegetation from 50 per cent to 60 per cent, equals \$1.6 billion per year for 10 years. If taken at face value, and if these benefits were to arise from increased flows, then the benefits of reform exceed the \$8.9 billion allocated over 10 years for water infrastructure and the buyback of water entitlements as part of *Water for the Future*.

- The at least \$3.7 billion, in dollar amounts, that has been allocated to States to co-operate on water reform will be honoured by the Commonwealth Government, but *not* the specific actions or investments defined by State priority projects;
- The establishment of a Basin Plan to be implemented July 2011 will define water entitlements for the environment as part of 'no take' or non-consumptive water allocations in the setting of SDLs.

## Market-based Water Recovery versus Infrastructure Subsidies

The purchase of water entitlements to increase environmental flows, as currently practised by the Commonwealth Government, involves a series of 'rolling tenders' whereby holders of water entitlements provide an offer price to sell their entitlements to the Department of Environment, Water, Heritage and Arts (DEWHA), which is charged with undertaking the purchases. If the offer price is deemed to represent 'value for money' relative to competitive water markets, and if the entitlement is in a catchment where there are key environmental assets (such as Ramsar wetlands), then DEWHA accepts the bid and the eventual sale takes place after the necessary conveyancing.

The actual water available for the environment is less than the nominal volume on the entitlement as the long-term cap equivalent, which represents the average allocation to the entitlement, can be much less. As of September 2009 the long-term cap equivalent of water-entitlement purchases undertaken by the Commonwealth Government up until that date was about 64 per cent.<sup>11</sup> Thus, if the Commonwealth had 1000 GL of water entitlements then, on average, it would only expect to receive 640 GL for these entitlements. In dry years, it would receive much less than the long-term cap equivalent.

An important issue with market-based water recovery is the existence of trade restrictions. Although the Commonwealth Government has secured an exemption for its purchases of water entitlements for the environment under the 4 per cent rule in Victoria, in September 2009 it signed a Memorandum of Understanding with the New South Wales Government that limits its purchases in that state. This agreement restricts Commonwealth Government purchases of general security water entitlements (or equivalent) to a maximum of 200 GL until 2011–2012 (Gillard and Rees 2009).

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<sup>11</sup> Details on water recovery by the Commonwealth Government are available at <http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/2008-09.html>. Prices for high-security water entitlements in New South Wales average over \$2,300/ML, while general-security water entitlements have a lower price in the same catchment. The purchase costs of general-security entitlements in the Murrumbidgee are about \$1,100/ML.

Water-reform subsidies for infrastructure are in two principal forms. They include upgrades to public or supply infrastructure off-farm, and improvements in on-farm irrigation to increase water-use efficiency. In return for providing infrastructure subsidies, the Commonwealth Government, through the Commonwealth Environmental Water Holder (CEWH), receives water entitlements that it can use for the environment. Typically, the CEWH will receive 50 per cent of the expected water savings from infrastructure subsidies in the form of water entitlements. The actual cost of the water delivered for the environment varies substantially by project, but are typically much more expensive than purchasing water entitlements from willing sellers (Cruse and O’Keefe 2009). For instance, some of the planned projects, such as the Northern Victoria Irrigation Renewal Project will deliver 175 GL at a cost of over \$11,000 per ML.<sup>12</sup> By comparison, the median price of high-reliability water entitlements per ML in Northern Victoria in 2008–2009 was \$2300/ML (National Water Commission 2009a: 87).

The Commonwealth Government expectation is that both market-based water recovery and infrastructure subsidies should deliver ‘value for money’, but it does not define how ‘value for money’ is to be operationalised.<sup>13</sup> In the case of subsidies, the government also wants SRWUI to secure a long-term future for irrigation communities. An evaluation by the Productivity Commission in May 2010 that compares water entitlement purchases and subsidies for irrigation concluded that ‘...the Australian Government may pay up to four times as much for recovering water through infrastructure upgrades than through water purchases. In other words, a premium of up to \$7500 ML may be paid for recovering water through infrastructure upgrades...’ (Productivity Commission 2010: 129).

Research by Qureshi *et al.* (2010) supports the economic arguments for the cost-effectiveness of market-based water recovery relative to subsidies for infrastructure (Grafton 2007; Cruse and O’Keefe 2009; Lee and Ancev 2009). In their modelling of the Murrumbidgee catchment they account for return flows from irrigation that subsequently becomes available for downstream and aquifer users while also augmenting environmental flows. An improvement in

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12 The Northern Victoria Irrigation Renewal Project aims to achieve water savings in the order of 425 GL at a cost of \$2 billion. Stage 1 will deliver 225 GL of savings at an estimated cost of \$1 billion, of which 75 GL will be allocated to the environment. In Stage 2 200 GL of expected water savings will be delivered at a cost of \$1 billion. Stage 2 will allocate 100 GL to the environment. Much of these water savings will be achieved by improving metering of water, which does not provide more water to the environment and by reducing leakage it may actually reduce flows to the environment. Thus, at best, the Northern Victoria Irrigation Renewal Project is expected to deliver 175GL of environmental water at a total cost of \$2 billion or \$11,429/ML.

13 The Victorian Auditor-General (2010: viii) concluded that in the reference to the Northern Victoria Irrigation Renewal Project the business cases for the projects, as developed by the Victorian Government, ‘...lacked the evidentiary rigour appropriate to the risk and cost of the proposed projects. Analysis of costs and benefits was superficial and information to support the basis for water savings was lacking.’

on-farm efficiency that reduces return flows will have an offsetting and negative impact on environmental flows. As a result, in locations where there are lower levels of irrigation efficiency and return flows are larger, the cost-effectiveness of water recovery from purchasing water entitlements is enhanced relative to infrastructure subsidies. They find that improvements in water-use efficiency in the Murrumbidgee would, at most, deliver 143 GL of increased environmental flows for a cost of up to \$6000 per ML. By contrast, market-based water recovery could deliver up to 733 GL of environmental flows at a cost of \$3000 per ML. This research supports the findings of the Productivity Commission (2010) and emphasises that the most cost-effective method for governments to acquire water for the environment is to purchase water entitlements from willing sellers.

A key reason for the cost-effectiveness of water buybacks is that, in contrast to infrastructure subsidies, they provide farmers with flexibility as to how to use less water. Farmers who voluntarily choose to sell their water in a buyback and remain farming can employ deficit irrigation, change their land use and/or tillage practices or invest in improvements in irrigation efficiency. In the subsidy approach, water is acquired only through efficiency improvements whether it is the least costly method or not. Water-efficiency improvements may also have a 'rebound' effect in effecting reduced return flows and economically disadvantage irrigators and irrigation districts that, at their own expense, have already installed efficient irrigation systems.

## Environmental Benefits and Environmental Flows

Securing increased environmental flows is an important component to ensuring environmental sustainability. While this is necessary, the timing and location of flows and the size of the individual volumes released for the environment are equally critical. This is because the flow regime, rather than just the quantity of environmental flows, affects habitat quality, population of native species, biodiversity, recreational values and so on.<sup>14</sup> To account for these multiple benefits an environmental benefits index (EBI) should be used when determining 'value for money' when acquiring water for the environment.<sup>15</sup> In other words, the benefits of acquiring water near to a key environmental asset may be such that the EBI per dollar spent may be greater than in another catchment, even if the cost per ML to acquire the water entitlement is higher.

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14 King and Louw (1998) developed a 'Building Block Methodology' (BBM) to determine in-stream requirement that accounts for geomorphology, water chemistry, and biotic data that is built into monthly blocks of water. The approach is currently in use in South Africa in Kruger National Park. Researchers working on Victoria's Thomson River are currently monitoring how to accomplish the desired environmental objectives with less water (Dickson 2008).

15 EBIs have been used in the U.S. to rank how public funds should be allocated for conservation programs and in market-based frameworks in Australia to procure multiple environmental outcomes in land-use management (Eigenraam *et al.* 2007). The approach is also being developed for environmental flows in Victoria for multiple environmental objectives (Chee *et al.* 2009).

When purchasing water for the environment, a key question is how much water should be secured in a given environmental watering plan. Jones *et al.* (2002) argued that, on average, 3350 GL of extra environmental flows from Basin-wide sources and improved operations would be required to have a high probability of restoring the River Murray to a healthy working river. The Wentworth Group of Concerned Scientists (2010), based on findings of an Expert Reference Panel that reviewed studies of six large rivers in the MDB, has argued that working rivers are unlikely to be in a healthy state if flow regimes are reduced below two-thirds of their natural level. Using this as a guide the Wentworth Group of Concerned Scientists has calculated that environmental flows should increase, on average, by some 4400 GL per year in the MDB.

The *Living Murray First Step*, the RTB program as of May 2010, and various State initiatives collectively will contribute about 1200 GL of increased environmental flows, on average. Thus, to achieve a high probability of restoring the Murray River to a healthy state would require an *additional* 2150 GL per year of environmental flows on average delivered along the Murray. An extra 3200 GL of water per year would be required to achieve the two-thirds rule for all major catchments in the MDB (Wentworth Group of Concerned Scientists, 2010: 14).

### Opportunity Costs and Acquisition Costs of Increasing Environmental Flows

The opportunity cost of forgone profits to irrigated agriculture from achieving the two-thirds rule can be calculated using an integrated hydro-economic linear programming model of the Basin developed for this purpose. This model is described in more detail in Grafton and Jiang (2010) and is a hydro-economic model of the Murray-Darling Basin.<sup>16</sup> It uses previous hydrological studies in the MDB and data from various sources to simulate the river flow and agricultural production in the Basin (Jiang 2010). In the hydrological component, the model includes water-delivery loss rates between regions obtained from the CSIRO sustainable-yields project (CSIRO 2008). In the economic component, it uses data from the Australian Bureau of Statistics and Bryan and Marvanek (2004) to model the seven largest uses of water diverted by irrigators: pasture and hay, rice, cotton, cereals (excluding rice), grapes, fruit (excluding grapes), and vegetables.

The model is optimised by maximising the profit from irrigated agricultural production across the Basin accounting for hydrological realities and irrigated land availability in the 18 regions in the model. On a Basin level, the model

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<sup>16</sup> Mainuddin *et al.* (2007) developed a hydro-economic model of the southern Basin and investigated the effects of reduced water diversions on irrigated agriculture of up to 1500 GL/year. Grafton and Jiang (2010) are the first to make such a hydrological-economic assessment for much larger reductions, for the entire Basin and to use the CSIRO sustainable yields regions in the model.

calibrates well to recorded data on irrigated land use (1.819 million ha. in model versus 1.824 million ha. actual) and water use (10,147 GL versus 10,516 GL actual) in 2000–2001 (Jiang 2010). The value of the model is that it provides a quantitative assessment of the opportunity costs, or forgone profits in irrigated agriculture, from reduced water diversions at the Basin level.

The predicted annual opportunity costs to irrigated agriculture measured in reduced profits from reduced water diversions, assuming unrestricted water trade, are summarised in Table 1. The results indicate that if surface-water extractions to irrigators were to be reduced by 30 per cent to approximate the increased environmental flows to achieve a high probability of a healthy Murray River, profits from irrigated agriculture would fall by about 10 per cent. To achieve the two-thirds rule at a Basin level, surface-water extraction by irrigators would need to fall by about 40 per cent and this would reduce annual profits by about 16 Per cent. The opportunity costs would be higher (lower) if the surface-water diversions were lower (higher) because the marginal value of an extra ML of water to agriculture is greater the less water is available for extraction.

**Table 1: Profit (\$ million/year) and Change in Profit (%) from Reduced Water Diversions to Irrigated Agriculture in the Murray-Darling Basin, based on 2000–2001 Surface-water Extractions**

	No buyback	10% reduction	20% reduction	30% reduction	40% reduction
Profit (\$ million)	1578	1539	1484	1428	1320
Net change	0.00%	-2.4%	-6.0%	-9.5%	-16.3%

Source: Adapted from Grafton and Jiang (2010).

The present value of the forgone profits from reduced surface-water extractions by irrigators can be calculated using a 50-year time horizon and a 3, 5 and 10 per cent discount rate. These results are presented in Table 2. The present value of forgone irrigated agriculture profits from a 30 per cent reduction in surface-water diversions is \$3.87, 2.74 and 1.49 billion with a 3, 5 and 10 per cent discount rate, respectively. By comparison, the present value of forgone irrigated agriculture profits from a 40 per cent reduction in surface-water diversions profits is \$6.64, 4.71 and 2.56 billion using a 3, 5 and 10 per cent discount rate, respectively. These results indicate that there are sufficient funds available in *Water for the Future* to fully compensate irrigators for up to 40 per cent reductions in surface-water diversions in the MDB.

**Table 2: Present Value (\$ billion) of Forgone Profits to Irrigated Agriculture from Reduced Surface-water Diversions in the Murray-Darling Basin, Based on 2000–2001 Surface-water Extractions**

Discount Rate	10% reduction	20% reduction	30% reduction	40% reduction
3%	0.99	2.43	3.87	6.64
5%	0.7	1.72	2.74	4.71
10%	0.38	0.94	1.49	2.56

Notes: Direct losses are reduced on-farm profits in irrigated agriculture from base-case results based on a 50-year planning horizon.

Source: Adapted from Grafton and Jiang (2010).

If the reduction in surface-water diversions were accomplished by voluntary reverse tenders then holders of water entitlements would be fully compensated for these forgone profits. This is because owners would voluntarily sell their entitlements only if the amount they received in the tender process equalled or exceeded the present value of the profits they could have earned from using the seasonal allocations attached to their entitlements. To deliver environmental flows from the purchased water entitlements would require that there be ‘carryover’ rights of allocations from one irrigation season to the next so as to ensure that environmental water can be saved and stored to deliver ‘pulse’ events.

Table 3 provides the estimated costs *over and above* the \$3.1 billion money allocated to acquiring water entitlements in the *Water for the Future* package to achieve 10 per cent to 40 per cent reductions in irrigated-agriculture surface-water diversions in the Basin, based on 2000–2001 data. These estimated costs are additional to funds already spent under the RTB for the *Water for the Future* and other initiatives and are the extra expenditures needed to acquire water entitlements to achieve the stated reductions.<sup>17</sup> By contrast to Table 2, the estimated costs of water-entitlement acquisitions are calculated based on the average price per ML acquired by the Commonwealth Government until 30 September 2009.

<sup>17</sup> As of the end of 2009 the Commonwealth Government had acquired about 800 GL of water at a total cost of just over \$1.2 billion. Water entitlements for the environment have also been obtained under other initiatives such as Water for Rivers (approx. 200 GL of entitlements) and Rivers for Environmental Restoration Program (about 100 GL of water entitlements).

**Table 3: Additional Government Expenditures in the Murray-Darling Basin to Achieve Different Reductions in Surface-water Extractions by Irrigated Agriculture, Based on 2000–2001 Surface-water Extractions**

	10% reduction	20% reduction	30% reduction	40% reduction
Total Irrigated Diversions (GL)	9133	8118	7103	6088
Increased environmental flows associated with reductions in surface-water extractions to irrigators (GL)	1015	2029	3044	4059
Water already acquired or expected to be acquired in Water for the Future and existing initiatives (GL) <sup>1</sup>	2070	2070	2070	2070
Additional water (GL) required over and above that expected to be acquired in Water for the Future and other initiatives <sup>2</sup>	NA <sup>3</sup>	NA	974	1989
Additional government expenditure (\$ billion) at \$2378/ML per long-term cap equivalent in excess of \$3.1 billion budgeted in Water for the Future <sup>4</sup>	NA	NA	2.32	4.73

## Notes:

1. Average purchase price of water entitlements until 30 September 2009 was \$2,378/ML per long-term cap equivalent (LTCE). If this average price were maintained for the entire \$3.1 billion 'Restoring the Balance' program, the government would acquire approximately 1300 GL of water entitlements defined in terms of long-term cap equivalent. If this amount is added to water already acquired for the environment through the Living Murray First Step (500 GL) and other initiatives (270 GL) as outlined in the Productivity Commission (2010, Appendix B), the expected total amount of water that will be, or has already been, recovered is about 2070 GL in LTCE under existing policies.

2. The increased environmental flows in the second row of numbers less the expected increased environmental flows in the third row of numbers gives the additional water required to achieve the specified reduction in surface-water extractions by irrigators.

3. NA = not applicable such that no additional water needs to be required.

4. The additional water required (if positive) multiplied by the average price of water acquired until 30 September 2009 under 'Restoring the Balance' of \$2378/ML generates the additional government expenditures for water entitlements over and above the budgeted \$3.1 billion in *Water for the Future*.

A 30 per cent reduction is similar to the water requirements to achieve a high probability of a healthy working Murray River. To achieve this objective, an additional \$2.32 billion based on market prices of previous water-entitlement purchases, over and above the \$3.1 billion allocated to RTB, for a total cost of \$5.42 billion will be required for the purchase of water entitlements. A 40 per cent reduction in surface-water extractions by irrigators is similar to the amount of increased environmental flows required to achieve the two-thirds rule. To achieve this goal, an extra \$4.73 billion based on market prices of previous water-entitlement purchases would be required to achieve these increased environmental flows for a total cost of \$7.83 billion. Given the total budget for both RTB and SRWUI is \$8.9 billion, this indicates that the two-thirds rule that

achieves the largest increase in environmental flows, on average, is achievable with the existing funding allocated for *Water for the Future*. Unspent funds left over from the \$8.9 billion could be used to invest in communities in various ways to help achieve a stated goal of *Water for the Future* to 'secure a long-term future for irrigation communities', or be used for other purposes.<sup>18</sup>

Important implications of Tables 1–3 and the underlying modelling are:

- There is a high probability that key environmental assets in the Basin can be sustained if there were about a 40 per cent reduction in surface-water diversions for irrigated agriculture and a concomitant increase in environmental flows.
- The funds budgeted in *Water for the Future* are sufficient to credibly achieve environmental sustainability if, and only if, there is a reallocation of funding from investments in infrastructure towards additional market-based water recovery.
- The \$8.9 billion available in *Water for the Future* (RTB and SRWUI combined) exceeds both the forgone profits of irrigators from 40 per cent reduction in surface-water diversions and the expected cost of acquiring water entitlements based on the average cost to acquire water entitlements for the environment (\$2378/ML per long-term cap equivalent) up until 30 September 2009.
- To allow environmental water to 'piggy back' on natural flood events and ensure required 'pulse' events, seasonal allocations assigned to environmental-water entitlements need to be allowed to be fully carried over in water storages from one season to the next.

### Sustainable Diversion Limits and Market-Based Water Recovery

A draft Basin plan should be announced in 2010 and the final Basin Plan, as developed by the MDBA, should be implemented from July 2011. A key feature of the Basin Plan will be the SDLs for both groundwater and surface water defined for the entire Basin and by catchment (Murray-Darling Basin Authority 2009). These SDLs will replace the existing Cap that was developed based on historical use. Although the Basin Plan will be operational from July 2011, it will not be legally binding until the current water-resource plans of the States expire.

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18 These investments would not be restricted to irrigation. A process of how these investments could be made is discussed by the Wentworth Group of Concerned Scientists (2010) and involves a process of active engagement with affected communities. Any investments in affected communities by governments should involve some form of co-funding such that communities and other investors would be required to put at risk some of their own equity into funded projects so that communities would have a stake in both the success and failure of the investments.

Until the Draft Basin Plan is announced, it is not known what will be the proposed reduction in current diversions within the Basin. However, given the dire state of many of the environmental assets and the requirement of the *Water Act 2007* that water diversions under the Basin Plan be environmentally sustainable, the work of Jones *et al.* (2002) and the Wentworth Group of Concerned Scientists suggest that at least a 30 per cent reduction in agricultural surface diversions might be expected when setting the SDLs.

A difficulty in continuing market-based water recovery after the Basin Plan is implemented in July 2011 is that water entitlements purchased by governments for environmental purposes will not be considered as part of the 'take' or consumptive use. Consequently, market-based water recovery after the Basin Plan is implemented would require revisions to the SDLs to account for increased environmental holdings by governments. Rather than change the Basin Plan shortly after it is implemented, which will be difficult to do, it would be preferable to complete *all* the purchases of water entitlements for the environment prior to July 2011.

### A Two-tender Process

A process to reduce surface-water extractions by irrigators in the MDB may be best accomplished through two reverse tenders *after* the announcement of the draft Basin Plan in 2010 and before its implementation in July 2011. Such a method for water recovery has been proposed by the Wentworth Group of Concerned Scientists (2010). A similar approach has also been used successfully in the past with the buyback of statutory fishing licences in Commonwealth fisheries in 2007.<sup>19</sup> Its principal advantage is that it allows supply (offers for sale by holders of entitlements) and demand (required flows for environmental assets and ecosystems services in the Draft Basin Plan) to balance via a market process. The two reverse tenders would allow for better targeting of purchases to meet the SDLs and may be achieved at a lower cost per ML of long-term cap equivalent water acquired than previous purchases by the Commonwealth Government. This is because the alternative, if there is a gap between long-term average extractions and SDLs in the Draft Basin Plan, is for irrigators to suffer reduced reliability of their water entitlements from July 2011.

All water-entitlement holders would all be allowed to participate in the two reverse tenders anywhere in the Basin, but the selection of what water entitlements were funded would be based solely on the expected environmental benefits per dollar spent or, if this proved impossible to implement, then on 'value for money' calculated on the basis of the cost to acquire per ML of actual

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<sup>19</sup> For further details, see [http://www.daffa.gov.au/fisheries/domestic/fishingfuture/business\\_exit\\_assistance](http://www.daffa.gov.au/fisheries/domestic/fishingfuture/business_exit_assistance).

water restored to the environment. The dollar amount *spent* in each State could also be specified as a constraint, if necessary, to meet the spending targets agreed to by COAG in the July 2008 Intergovernmental Agreement on Murray-Darling Basin Reform. However, a reasonable condition by the Commonwealth Government for accepting state-by-state spending constraints in the tender process would be the full co-operation by all States in the removal of arbitrary restrictions on water entitlement and seasonal allocation trade. If State spending constraints defined by COAG agreements were maintained, the actual project spending or water entitlements purchased would *not* be constrained within each State and would be determined on the basis of cost effectiveness.

The purchase of water entitlements with two reverse tenders would provide the farmers in the Basin with the funds necessary to undertake autonomous adjustment to the Basin Plan. It would also provide the Commonwealth Government with a large holding of water entitlements prior to implementation of the Basin Plan that would be treated like other entitlements in water allocations. Thus, unlike rules-based or planned water in existing water-resource plans that lack rules aligned to objectives (Hamstead 2009), there would be an assurance that the actual water allocated to water entitlements would be used for environmental flows. This is particularly important given the poor state of many river valleys in the Basin, and the fact that it will not be until 2019 that all State water-resource plans need to become fully compliant with the Basin Plan.

## Conclusion

Water reform in the Murray-Darling Basin is at a proverbial watershed. The principles in the form of the *National Water Initiative* are well defined and are agreed to by all governments. The 'rules' of reform are defined in the form of the *Water Act 2007* and its amendments. Together they provide the framework to implement reform. Unfortunately, the financial incentives for reform, as defined under the \$12.9 billion *Water for the Future*, will not achieve the twin goals of ensuring environmental sustainability and 'value for money'.

Using the principal constraints on the amount of funding available faced by the Commonwealth Government, and the existing expenditure commitments to States, it is argued that the stated objectives could be achieved in a much more cost-effective way. In particular, if the \$5.8 billion targeted for water infrastructure subsidies were added to the \$3.1 billion allocated to buying water entitlements, the Commonwealth Government would be able to buy a sufficient volume of water entitlements from willing sellers to ensure a high probability of healthy working rivers within the Basin, and for no extra cost. Further, economic modelling suggests that the combined fund of \$8.9 billion to

purchase water entitlements for the environment exceeds the estimated forgone profits to irrigators from reduced diversions expected in the Draft Basin Plan, and also the expected acquisition costs.

If the combined fund were used to purchase water entitlements so as to maximise the expected environmental benefits per dollar spent, or to obtain the largest quantity of water per dollar of expenditure, then sufficient water could be obtained while fully compensating irrigators for reduced diversions. If this money were spent prior to the implementation of the Basin Plan in July 2011 with two reverse tenders it would greatly assist holders of water entitlements, and also irrigation communities, to autonomously adjust to lower water diversions.

## References

- Australian Bureau of Statistics 2008, *Water and the Murray-Darling Basin: A Statistical Profile 2001–01 to 2005–06*. Catalogue No 4610.0.55.007, Australian Bureau of Statistics: Canberra.
- Australian Bureau of Statistics, Australian Bureau of Agricultural and Resource Economics, Bureau of Rural Sciences 2009, 'Socio-Economic Context for the Murray-Darling Basin', Descriptive report, MDBA Technical Report Series: Basin Plan, BP02.
- Australian Competition & Consumer Commission (ACCC) 2009, *Water Trading Rules: Draft Advice*, Australian Competition & Consumer Commission, Canberra.
- Bryan, B. A., Hajkowicz, S., Marvanek, S. and Young, M. D. 2009, 'Mapping Economic Returns to Agriculture for Informing Environmental Policy in the Murray-Darling Basin, Australia'. *Environmental Modelling and Assessment* 14: 375–90.
- Bryan, B. and Marvanek, S. 2004, 'Quantifying and valuing land use changes for Integrated Catchment Management evaluation in the Murray-Darling Basin 1996/97 2000/01'. Stage 2 report to the Murray-Darling Basin Commission. Available for download at: [http://www.clw.csiro.au/publications/consultancy/2004/MDBC\\_stage2\\_report\\_exec\\_summary.pdf](http://www.clw.csiro.au/publications/consultancy/2004/MDBC_stage2_report_exec_summary.pdf)
- Chee, Y., Webb, J. A. Stewardson, M. and Cottingham, P. 2009, *Victorian Environmental Flows Monitoring and Assessment Program: Monitoring and Evaluation of environmental Flow Releases in the Glenelg River*. Report prepared for the Glenelg-Hopkins Catchment Management Authority and the Department of Sustainability and Environment. E-Water cooperative Research Centre, Canberra.

- Connell, D. 2010, *Sustainability and the National Water Initiative*. Available for download at: [http://cweep.anu.edu.au/pdf/publications/research\\_papers/10-06\\_NationalWater.pdf](http://cweep.anu.edu.au/pdf/publications/research_papers/10-06_NationalWater.pdf)
- Connell, D. and Grafton R. Q. 2008, 'Planning for Water Security in the Murray-Darling Basin', *Public Policy* 3(1): 67–86.
- Council of Australian Governments (COAG) 2004, *Intergovernmental Agreement on a National Water Initiative*.
- Cruse, L. and O'Keefe, S. 2008, 'Acknowledging Scarcity and Achieving reform' in *Water Policy in Australia: The Impact of Change and Uncertainty* (L. Cruse Ed.), Resources for the Future: Washington, D.C.
- Cruse, L. and O'Keefe, S. 2009, 'The Paradox of National Water Savings: A Critique of "Water for the Future"', *Agenda* 16(1): 45–60.
- CSIRO 2008, 'Water availability in the Murray-Darling Basin'. A report to the Australian Government from the CSIRO Murray-Darling Basin Sustainable Yields Project, CSIRO, Australia: 67pp.
- Davies, P., Harris J., Hillman T. and Walker K. 2008, 'Sustainable Rivers Audit: A report on the ecological health of rivers in the Murray-Darling Basin'. Prepared by the Independent Sustainable Rivers Audit Group for the Murray-Darling Basin Ministerial Council.
- Department of Environment, Water, Heritage and the Arts (DEWHA) 2009, 'A Framework for Determining Commonwealth Environmental Water Actions', A Discussion Paper. Available at: <http://www.environment.gov.au/water/policy-programs/cehw/pubs/cehw-framework-discussion-paper.pdf>
- Dickson, M. 2008. *Environmental Flows Monitoring for the Thomson and Macalister Rivers 2008–2011: Monitoring Design Report*. West Gippsland Catchment Management Authority. Mimeograph.
- Eigenraam, M., Strappazzon, L., Lansdell, N., Beverly, C. and Stoneham, G. 2007, 'Designing Frameworks to Deliver Unknown Information to Support Market-Based Instruments', *Agricultural Economics* 37: 261–69.
- Gillard, J. and Rees, N. 2009, Memorandum of Understanding in Relation to Water for the Environment. Signed 23 September 2009 between the State of New South Wales and the Commonwealth of Australia.
- Grafton, R. Q. 2007, 'An Economic Evaluation of the National Plan for Water Security', *Dry Water*, Policy Briefs No. 3, The Crawford School of Economics

- and Government, The Australian National University. Available for download at: [http://www.agrifood.info/connections/2007/Grafton\\_Bennett\\_Hussey.pdf](http://www.agrifood.info/connections/2007/Grafton_Bennett_Hussey.pdf)
- Grafton, R. Q. 2010, The Economics of Water Reform in the Murray-Darling Basin. Submission 81 to the Productivity Commission. Available for download at: [http://www.pc.gov.au/\\_\\_data/assets/pdf\\_file/0008/94850/subdr081.pdf](http://www.pc.gov.au/__data/assets/pdf_file/0008/94850/subdr081.pdf)
- Grafton, R. Q. and Hussey, K. 2007, 'Buying Back the Living Murray: at what price?' *Australasian Journal of Environmental Management* 14: 74–81.
- Grafton, R. Q. and Jiang, Q. 2010, 'Economics of Drought, Water Diversions, Water recovery and Climate Change in the Murray-Darling Basin', Centre for Water Economics, Environment and Policy (CWEEP) Research Paper 10-01. Available for download at: [http://cweep.anu.edu.au/pdf/publications/research\\_papers/10-11\\_economics\\_of\\_water.pdf](http://cweep.anu.edu.au/pdf/publications/research_papers/10-11_economics_of_water.pdf)
- Hamstead, M. 2009, *Improving Environmental Sustainability in Water Planning*. National Water Commission, Canberra.
- Hamstead, M., Bladwin C. and O'Keefe, V. 2008, *Water Allocation Planning in Australia — Current Practices and Lessons Learned*. National Water Commission, Canberra.
- Jiang, Q. 2010, 'An overview of the integrated irrigated agriculture water model', Centre for Water Economics, Environment and Policy Working Paper, Crawford School, The Australian National University: Canberra.
- Jones, G., Hillman, T., Kingsford, R., McMahon, T., Walker, K., Arthington, A., Whittington, J. and Cartwright, S. 2002, 'Independent Report of the Expert Reference Panel on Environmental Flows and Water Quality Requirements for the River Murray System', Prepared for the River Murray Project Board. Canberra.
- King, J. M. and Louw, D. 1998, 'In-stream flow assessments for regulated rivers in South Africa using the Building Block Methodology', *Aquatic Ecosystem Health and Management* 1: 109–24.
- Lee, L, and Ancev, T. 2009, 'Two Decades of Murray-Darling Water Management: A River of Funding, a Trickle of Achievement', *Agenda* 16(1): 5–23.
- Mainuddin, M, Kirby, M. and Qureshi, E. 2007. 'Integrated Hydrological-Economic Modelling for Analyzing Water Acquisition Strategies in the Murray River Basin', *Agricultural Water Management* 93: 123–35.

Morrison, M., Hatton-MacDonald, D., Boyle, K. and Rose, J. 2010, 'Ecological Values for a Major River System at Risk: Australia's Murray-Darling River System', Mimeograph.

Murray-Darling Basin Authority 2009, 'Issues Paper: Development of Sustainable Diversion Limits for the Murray-Darling Basin', MDBA publication no. 49/09. Available for download at: <http://www.mdba.gov.au/files/publications/sustainable-diversion-limits-issues-paper-12-11-09.pdf>

National Water Commission 2009a, *National Water Commission Australian Markets Report 2008–2009*, National Water Commission, Canberra.

National Water Commission 2009b, *Australian Water Reform 2009: Second biennial assessment of progress in implementation of the National Water Initiative*, National Water Commission, Canberra.

New South Wales Natural Resources Commission 2009, *Riverina Bioregion Regional Forest Assessment: River Red Gum and Other Woodland Forests*. New South Wales Natural Resources Commission, Sydney.

Productivity Commission 2010, 'Market Mechanisms for Recovering Water in the Murray-Darling Basin', Productivity Commission Research Report, Final report March, Productivity Commission: Melbourne.

Qureshi, M. E., Schwabe, K., Connor, J. and Kirby, M. 2010, 'Environmental Water Incentive Policy and Return Flows', *Water Resources Research* (In press). Available for download at: <http://www.agu.org/journals/pip/wr/2008WR007445-pip.pdf>

The Senate Standing Committee on Rural and Regional Affairs and Transport 2008, *Water Management in the Coorong and the Lower Lakes*, Parliament of Australia, October.

Victorian Auditor-General 2010, *Irrigation Efficiency Programs*, Victorian Government Printer.

Wentworth Group of Concerned Scientists in association with R. Q. Grafton, I. Kowalick, C. Miller, T. Stubbs, F. Verity and K. Walker 2010, *Sustainable Diversions in the Murray-Darling Basin: An Analysis of the Options for Achieving a Sustainable Diversion Limit in the Murray-Darling Basin*. Available for download at: <http://www.wentworthgroup.org>

Wong, P. 2008, 'Rudd Government to Invest \$12.9 billion in Water', *Media release no. PW 56/08*. Available for download at: <http://www.climatechange.gov.au/~media/Files/minister/wong/2008/Media%20Releases/April/mr20080429.ashx>

# The High Cost of Taxi Regulation, with Special Reference to Sydney

PETER ABELSON<sup>1</sup>

## Abstract

*Numerous regulations govern entry, industry structure, service quality and prices for the Sydney taxi industry. The paper finds few efficiency or social reasons for these regulations and taxi performance is poor. On plausible assumptions, the net benefits from unrestricted entry into the Sydney taxi industry are in the order of \$265 million per annum. The productivity and service benefits of reforming entry would be greater if accompanied by reform of the anti-competitive control of the taxi radio networks over all taxi operators.*

## Introduction<sup>2</sup>

The taxi industry is heavily regulated in most Australian cities, with regulations covering the number of taxis, industry structure, service quality and prices. These regulations have been retained despite numerous Australian and international reviews finding that the taxi industry is over-regulated in Australia and other countries respectively (see Productivity Commission 1999; National Competition Council 2000; UK Office of Fair Trading 2003; OECD 2007). Moreover, in cities in New Zealand, Ireland, the Netherlands, Sweden and the United Kingdom where supply restrictions have been removed or loosened,

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2 I thank the two referees and the Editor for comments on the draft paper. All information in this paper is drawn from public sources or based on data that the author has collected from industry participants or observers. This paper is the academic research of the author, and the full responsibility of the author. It does not necessarily reflect the views of the NSW Treasury.

'the results of these reforms have been highly positive, with reduced waiting times, increased consumer satisfaction and, in many cases, falling prices being observed' (OECD 2007: 8).

In this paper I describe the regulations on the taxi industry in Sydney and discuss the consequences, discuss public policy objectives and estimate the benefits of deregulation, discuss why the government is so reluctant to deregulate the industry and conclude with policy suggestions. While the focus is on Sydney, similar issues exist in most other Australian cities.

## The Taxi Industry in Sydney

Figure 1 provides a sketch of the taxi industry in Sydney. There are four main participants: owners of taxi 'plates', operators of taxis, taxi radio networks and taxi drivers.<sup>3</sup> A plate is essentially a piece of paper conferring on the owner the right to operate a taxi. Operators of taxis must acquire a plate (as well as an operator's licence by undertaking a training course) in order to operate a taxi but they often lease the plate from a plate owner.

About 3600 entities own 5174 taxi plates in Sydney (IPART 2009). Some 75 per cent of the plates are perpetual taxi licences mostly issued free before 1990. The other 25 percent of plates issued or sold by the Government since 1990 include: 'ordinary licences' (10–50 years), 'short-term licences' (1–6 years), 479 wheelchair-accessible taxi (WAT) licences and 269 time-restricted taxis.

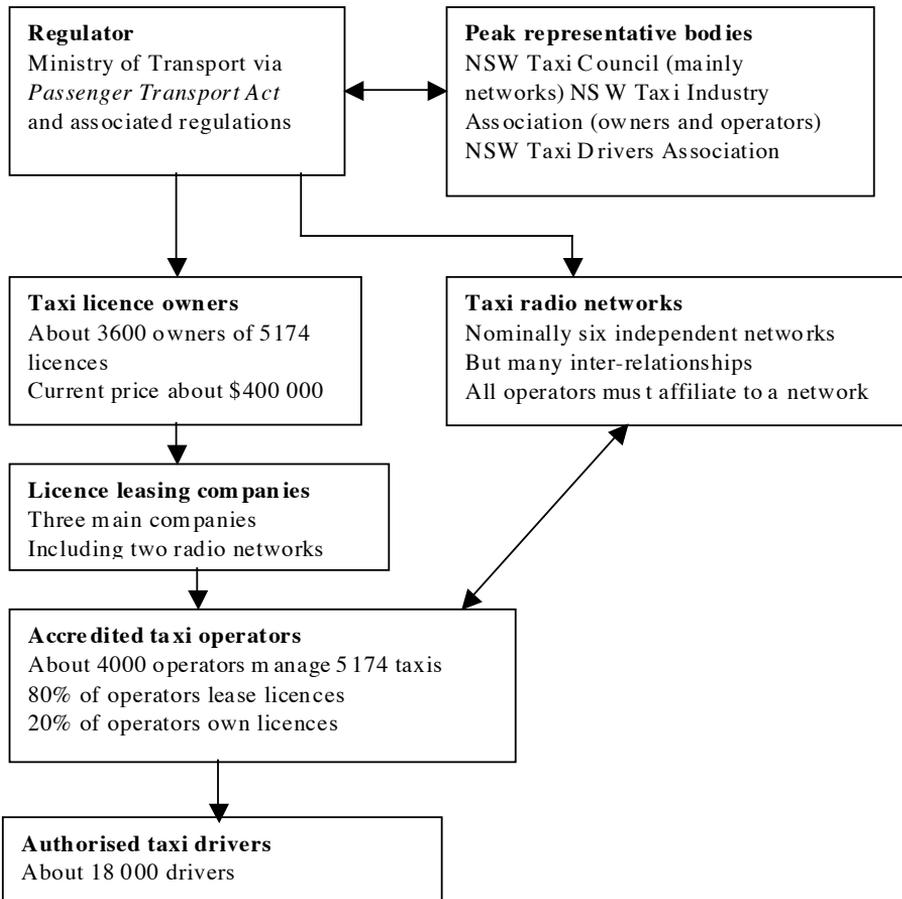
About 4000 operators manage the 5174 taxis. Eighty per cent of the operators lease a taxi plate; 20 per cent own a plate. Taxi operators manage, maintain and insure the taxis. They may drive the taxi or bail (lease) it to a driver. Critically, *government regulation requires all operators to be affiliated to an authorised taxi radio network*. These networks provide various services including a radio booking system, a GPS tracking system and alarm monitoring service.

The NSW Independent Pricing and Regulatory Tribunal (IPART 2009) lists 11 radio networks in Sydney. However, the Combined Communications Network (CCN), which is wholly owned by the publicly listed company Cabcharge, owns six of these radio networks and hosts another (St. George), so there are in effect six 'independent' networks. These are CCN (3341 taxis including St George): Premier (947 taxis), Legion (525 taxis), Manly and RSL which share a radio office (322 taxis combined) and Lime (67 taxis) — see IPART (2009) and Abelson (2010).

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<sup>3</sup> More detail on the taxi industry in Sydney can be found in IPART (2009) and Abelson (2010).

**Figure 1: Structure of taxi industry in Sydney**



There are direct management and financial relations between the three largest radio network companies. The managing director of the parent entity (Adelhill Limited) of Premier Cabs holds over a million shares in Cabcharge, has been a director of Cabcharge since 1996, and draws an annual salary of some \$100 000 from Cabcharge (Cabcharge, *Annual Report, 2007–08*). Cumberland Cabs Company Pty. Ltd., a subsidiary of Premier Cabs, owns over a million shares in Cabcharge. Legion Cabs (Trading) Cooperative Society Limited owns 2.75 million shares in Cabcharge. In addition, nearly all taxis are fitted with Cabcharge’s EFTPOS facility for which Cabcharge charges 11 per cent of the fare (GST inclusive).

Drawing on Cook (2005) and allowing for some growth, there are about 19 000 authorised taxi drivers in Sydney. The taxi drivers pay operators between \$120 and \$200 per shift depending on the time of the day and week. They also pay fuel costs.

In summary, the Cabcharge, Premier and Legion taxi radio networks control over 90 per cent of the taxi operators and taxis in Sydney, with the latter two networks having a strong allegiance to Cabcharge. This virtual monopoly is made possible because the government regulates that all operators must affiliate with an established network.<sup>4</sup>

## Major regulations of the Sydney taxi industry

There are four main forms of regulation on the taxi industry: regulations of quantity (or entry), industry structure, services and prices.

### Quantity (entry) regulations

The Ministry of Transport and Infrastructure (MTI) has always restricted the number of taxi plates either by offering a limited number to the market or by offering plates at uncompetitive prices compared to buying or leasing secondary market licences. Consequently the uptake of new licences has averaged only 1 per cent per annum and these have been mainly wheelchair-accessible taxis (MTI 2010a).

Drawing on various sources, an estimated 1300 plates have been issued since 1990. This represents an increase in the taxi stock of about 33 per cent over 20 years; that is, an average growth rate of 1.4 per cent per annum inclusive of new WAT licences. On the other hand, between 1991–92 and 2008–09, real gross state income rose by 85 per cent, which was equivalent to 3.8 per cent per annum.<sup>5</sup> Allowing an income elasticity of demand for taxi services of 1.0, demand for taxi services would have risen likewise by 85 per cent between 1991 and 2009. Consequently the price of a taxi licence rose from \$150 000 in 1990 to over \$400 000 in late 2009, a real price rise of some 66 per cent (MTI 2010b). Effectively the capitalised monopoly rents exceed \$2.0 billion.

Late in 2009, the government announced that it would auction a limited number of 10-year licences. For financial year 2010–11, it would auction 167 new 10-year licences, which is only about a 3 per cent increase in the stock. This has no impact on excess demand. According to AMB Taxi Brokers, by November 2010 the price for a taxi plate had risen to \$425 000 ([www.ambtaxi.com.au](http://www.ambtaxi.com.au)).

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4 The list of owners of taxi plates is not publicly available, but it is thought that the networks own only a small proportion of the plates.

5 ABS Cat. No. 5220.0, Australian National Accounts: State Accounts, Table 1.

## Regulation of industry structure

In the NSW regulatory structure, the radio networks are both major industry player and industry monitor. In effect, the regulations empower the networks to control all operators and drivers in Sydney. As outlined by the MTI (2008), this document:

forms part of the regulatory framework within which network providers are to provide clean, safe and reliable taxi services to the travelling public. ... The provision of these services is achieved through a complex set of regulatory mechanisms that reflects the structure of the NSW Taxi Industry and provides clarity on the taxi-cab network provider's accountabilities, include (*sic*) how these accountabilities are to be appropriately cascaded down through to taxi cab operators and drivers. In this regard, *the taxi-cab network provider is considered to be the principal entity for taxi-cab services.* (italics added)

Accordingly, taxi operators are required to:

- be affiliated with a taxi network for the provision of booking services,
- fit taxis with a network receiver and prescribed communication and safety devices, and
- ensure that all taxis are fitted with the decals of the network and painted in the colours of the network.

Taxi drivers are required at all times to:

wear the approved uniform of the network to which the taxi is connected,

- use the taxi's receiver in accordance with network procedures,
- observe the published rules and by-laws of the networks, and
- comply with all reasonable requests of the network with respect to passenger services.

Taxi drivers are prohibited from soliciting for work and from using unauthorised trunk radio devices to coordinate work with, or to pass work on to, other taxi drivers.<sup>6</sup>

To obtain a taxi network authorisation, an applicant must satisfy the Director-General of Transport that 'the applicant has the ability and *willingness to discipline any user of the network* who fails to meet the standards or comply with the rules'. (www.transport.nsw.gov.au. Emphasis added).

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<sup>6</sup> NSW Passenger Transport Regulation 2007, clause 147.

The key standards that the networks are expected to meet relate only to booked services. The networks are expected to meet at least 97 per cent of all booked requests over a month and to pick up at least 85 per cent of intending passengers with a waiting time of no more than 15 minutes and 98 per cent of passengers with a waiting time of no more than 30 minutes. These standards relate to the whole area of Sydney, but networks can offload to another network with a formal written agreement between the two networks.

### Service regulations

Numerous regulations apply to each segment of the taxi market.<sup>7</sup> The following three regulations have significant impacts on industry operations.

- All taxis must be large enough to carry at least four adult passengers and be less than six years old. The size requirement restricts the type of vehicle that may be used and increases unit costs.
- A taxi driver must accept a hiring immediately when offered whatever the destination within the Sydney metropolitan area. Taxi drivers are not allowed to specialise in services in particular areas or to particular clients. This contravenes the fundamental economic concept of gains from specialisation of services. As a taxi driver observed to the writer: 'Taxi drivers have very limited capacity to plan and optimise their schedule.'
- Taxis cannot display a destination sign except in very limited circumstances. This restricts the opportunity for multiple hiring. Indeed, multi-hiring en route is proscribed.

### Price regulations

The MTI (on the advice of the Independent Pricing and Regulatory Tribunal, IPART) sets fare structures and maximum fares. The fares include a flag-fall fare, distance and time charges, a night-time surcharge and booking fees. Road tolls and EFTPOS charges are added to the fares. The set fares include costs of taxi licences and are designed to ensure a full return on capital and labour for all participants in the taxi industry. However, IPART does not regulate the network fees to operators or Cabcharge's 11 per cent EFTPOS fee (GST inclusive), which is a monopolistic charge.

The fares do not distinguish between peak and off-peak periods, although there is significant excess demand for taxis in peak hours and excess supply in off-peak hours. At the request of the NSW Taxi Council, the peak industry body controlled by the networks, IPART (2008) recommended that a higher fee (up to \$11 extra) could be charged for premium services on condition that *the taxi must*

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<sup>7</sup> See Passenger Transport (Taxi-cab) Services Regulation 2001 and the Passenger Transport Regulation 2007.

*be booked through a network* and that the networks must offer a standard service at the regulated standard fee at the same time. It is not clear how premium services would be defined or how such a scheme would work.

In an attempt to protect the net income of taxi drivers, the NSW Office of Industrial Relations sets the maximum rates that drivers pay per shift to operators. These rates vary by time of day and week. These regulated rates appear to be mostly above market rates and so are not applicable; but if a driver wishes to hire a taxi at the most profitable time (Friday evening) he or she may have to agree to drive at a less profitable time (such as Monday evening). Immediately the fares increase on 1 July each year, so do driver pay-in rates.

## Performance of the Sydney taxi industry

To discuss performance standards, I draw on four sources. First, the Cook (2005) Inquiry into the industry was highly critical of network controls over taxi operators and drivers and their consequence for consumers: 'Over a very long time the regulatory framework has become distorted. It has protected the interests of established industry players while becoming punitive and ineffective in managing customer service.' The inquiry argued that the prime objective of the networks is to extract income and economic rents out of the operators. Only one in six services is a network-booked service. The rest are hailed off the street or taxi rank. The networks do not provide customer taxi services and have only indirect concern for the quality of the consumer service. In the words of a taxi operator interviewed by the writer: 'There is a cancer at the heart of the taxi industry. The control of the networks has eroded responsibility and reward for providing a quality taxi service'.

Second, IPART (2009) provides data on some key performance indicators for taxi booking services. As shown in Table 1, taxis pick up only 69 per cent of the passengers requesting bookings. However, an unknown number of unmet requests are due to customer cancellations or no-shows.

Table 2 shows waiting times for phone bookings based on network data. For passengers picked up, the waiting times are within regulated standards. However, these data are of doubtful value if many requests are not met. More fundamentally, bookings requested are *not* equivalent to bookings required. An unknown number of people do not book taxis in peak hours because the services are not reliable. This reduces further the utility of timeliness claims.

**Table 1: Bookings and pick-ups in 2008–09 (excluding WATs)**

Measure	No.	%
Number of bookings requested ('000)	12 736	
Number of jobs accepted by taxi drivers	10 100	79.3
Total pick-ups	8752	68.7

Source: IPART 2009.

**Table 2: Pick-up times as % of total pick-ups made and bookings requested**

	< 15 minutes	15–30 minutes	30–60 minutes	> 60 minutes	Other
All pick-ups	92.9%	6.3%	0.8%	0.0%	n/a
Bookings requested	63.8%	4.3%	0.5%	0.0%	31.3%

Source: IPART 2009.

The third source on performance is the Colmar Brunton (2003) survey of 1347 taxi users across Australia, including 302 taxi users in Sydney. The following are the main results.

- Of all Australian cities, Sydney recorded the lowest scores for taxi trip satisfaction.
- Thirty-eight per cent of respondents in inner Sydney and 22 per cent of respondents in outer Sydney had tried to get a taxi in the last six months and failed.
- About 5 per cent of respondents in Sydney had made a complaint to a taxi-related agency but four times that many had felt like complaining and did not do so.

Network-generated records of complaints (which are reported by IPART) are incomplete records of industry performance because many potential complainants do not bother to make a complaint.

The Australian Tourism and Transport Forum survey of *Taxi Standards in Australian Cities* in December 2009 (see [www.ttf.org.au](http://www.ttf.org.au)) provides a fourth source on performance. Over half the respondents were based in Sydney. Three-quarters of respondents regarded taxi services as poor or very poor in Australian cities and Sydney was rated the worst city. Ninety per cent of respondents said that reform of the taxi licensing scheme should be explored.

## The taxi industry in other Australian cities

Most Australian cities share many features of the Sydney taxi industry. These include highly regulated entry and high licence plate prices (over \$400 000 in Melbourne), requirements that operators must affiliate with a taxi radio network, the dominant role of the network(s) in the industry, the ubiquitous Cabcharge 11 per cent add-on for EFTPOS payments, close company relationships and high market shares for one or a few taxi companies in the city (Swan Taxis in Perth, Aerial in Canberra, Black and White Cabs and Yellow Cabs in Brisbane).

## Policy Objectives and Market Regulation

Policy objectives are often defined vaguely as the ‘public benefit’ (Nicholls 2003). Here I follow the standard economic classification of efficiency and equity (or social) objectives but also consider an objective that is sometimes proposed for public transport; namely, ‘universal’ or equal access.<sup>8</sup>

### Efficiency objectives

A market is efficient when firms supply the services that people want at least cost. It is inefficient when people are willing to pay for a service but it is not provided. It is well established that competitive markets produce these efficient outcomes (Abelson 2008).

We should note here that the taxi market may be viewed as three markets (cruising, rank and booked markets) with distinct features. There are also separate markets for taxi radio networks (or communications), operators and drivers. Most of these markets meet most requirements of a competitive market. They provide excludable private goods. There are few economic barriers to entry to and exit from the industry and, without regulation, most parts of the market would be competitive.

The economics literature identifies some potentially significant market failures in taxi markets, including imperfect competition, information failures and the interaction of demand and supply. Imperfect competition arises when there are significant fixed costs and average costs fall with size of operation. This

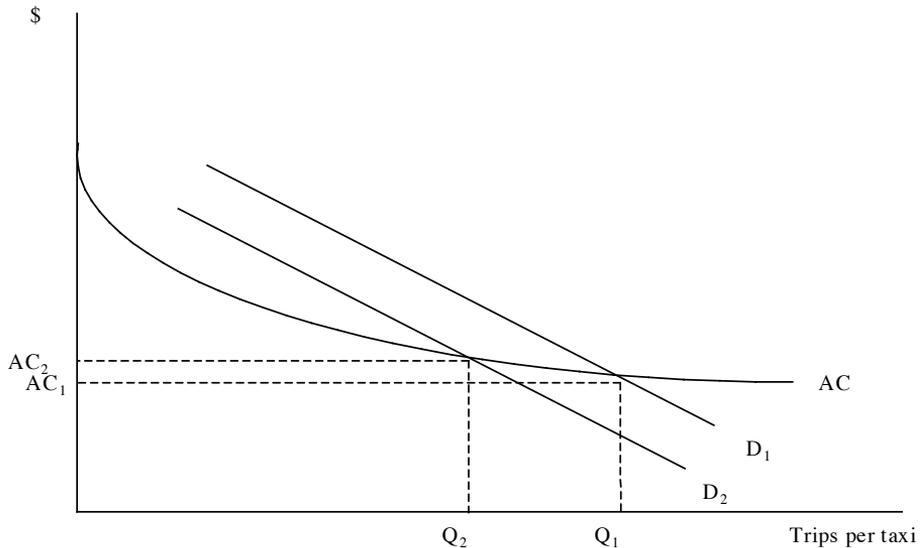
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<sup>8</sup> In hearings of the NSW Legislative Council Select Committee on the NSW Taxi Industry (20 February 2010), members of the Select Committee asked the author, who was giving evidence to the Committee, how deregulation of the taxi industry could achieve ‘universal access’ to taxis. This was clearly a perceived political objective.

phenomenon could conceivably apply to taxi radio networks. However, given the many potential suppliers of communications equipment, it is questionable whether there are major cost barriers to provision of radio network services.

Taxi-cab operations may also experience falling average cost. Many costs per shift are fixed and the marginal cost per trip is below average cost. The key concern is that an increase in taxis may increase idle time and reduce utilisation per taxi. If demand for a taxi's services falls from  $D_1$  to  $D_2$ , as in Figure 2, trips per shift fall from  $Q_1$  to  $Q_2$  and average cost rises.<sup>9</sup> Liston-Heyes and Liston-Heyes (2007) argue that this implies that that entry restriction would minimise unit costs.

**Figure 2: Rising average cost with declining taxi utilisation**



However, there are three offsetting factors. First, increased capacity provides an offsetting benefit by reducing passenger waiting time, which in turn increases the demand for taxi services. Second, if artificial imposts, such as fees for taxi plates, are abolished, in a price-regulated market like Sydney's the fares will fall and demand for taxi trips will increase at *no* cost to taxi drivers. Third, in a deregulated market, taxi drivers with spare time in off-peak hours may obtain income from alternative work such as community transport or courier work or even work outside the transport sector.

<sup>9</sup> Note that the demand curves in Figure 2 are downward-sloping, indicating minor locational differentiation of product in the hailing market. But the same result follows with horizontal demand curves.

Lack of information or, more precisely, asymmetric information, is another potential market failure. Taxi users may not know the quality of their taxi vehicle or driver, although in a competitive market operators would have an incentive to create a reputation of service. There is certainly a case for regulating safe standards for vehicles and drivers. However, safety issues are generally tackled most efficiently by testing vehicles and training and testing drivers rather than by suppressing trade.

In relation to price information, the main problems arise in the hailing market rather than in the rank or booking services. In the latter markets, comparative prices are easier to obtain.<sup>10</sup> In the hailing market, taxis have a spatial monopoly and there can be significant search costs. Then, monopoly pricing can occur even with a large number of prospective (deregulated) suppliers (Diamond 1971). Another predicted consequence of uninformed consumers in a deregulated hailing market is decline in service quality.

However, these conclusions assume that consumers are poorly informed about service quality and prices. It is increasingly possible for anybody to access comparative price information at any time on the Internet, even in the hailing market. Price information deficits can be dealt with by requiring taxis operators to post fares and/or indicative trip prices and other relevant service information on a common public website as well as in taxis.

Another efficiency issue is the inter-relationship between demand and supply. Demand is a function of fares and customer waiting time (and therefore of the supply of taxis). The supply of taxi services depends in turn on taxi fares and costs and on driver waiting time (and therefore on the demand for taxis). Some theorists (Cairns and Liston 1996; Liston-Heyes and Liston-Heyes 2007) have observed that this interaction between demand and supply can produce more than one equilibrium (output) solution in the market and that one equilibrium may be preferred on welfare grounds to another. In principle, this could justify some regulation. However, the practical implications are far from clear. It would be asking a lot of an industry regulator to adjust industry settings because of a market failure to achieve the preferred welfare-maximising equilibrium.

In summary, economic principles suggest that competition would improve services in the taxi industry. Information failures justify regulating vehicles and drivers for safety issues. Other market failures provide little justification for substantive regulation of the industry.

Notwithstanding these arguments, some analysts have concluded that deregulation of taxi markets has had adverse consequences (Teal and Berglund 1987; Dempsey 1996; Toner 1996). Bekken (2007) produced a balanced and

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<sup>10</sup> However, this may cause problems in congested areas such as airports.

more up-to-date summary for European countries which was accepted by OECD (2007). Bekken found that removal of entry restrictions significantly reduces waiting times. Their removal may not reduce fares because fares are often inefficiently depressed (especially in peak hours) under a regulated regime. Also, unit costs may rise because of lower utilisation in low-demand areas. And, almost always, deregulation produces more fare and service variations. When entry is deregulated but fares remain regulated, servicing of profitable areas tends to increase and servicing of less-profitable areas to fall. Also, vehicle or driver standards have fallen in some places, but this may reflect inappropriate relaxation of regulations rather than unrestricted entry.

The conclusion is that an efficient policy package is required. Deregulation of entry needs to be combined with deregulation of industry structure and service rules and possibly price deregulation, but with continued regulation of basic taxi and driver standards.

## Equity objectives

There are many possible equity objectives. They may include protecting consumers generally or by area or by type of user such as those who need wheelchair access. Price regulation or cross-price subsidies may protect consumers albeit at a potential loss of competition and services for some consumers.

Government may also aim to protect one or more of the industry supplier groups. Restrictions on entry protect existing owners of capital, but discriminate against new entrants. Entry restrictions may also be viewed as supporting incomes of existing taxi drivers but, as will be seen below, this is an illusion.

Current price regulations in Sydney are presumably designed to protect consumers against higher prices as well as to increase wheelchair-assisted services. They are also designed to protect owners of taxi plates. Undoubtedly, the regulations also assist the taxi radio networks but this may be a by-product of policy rather than an objective.

A broader interpretation of the regulations in Sydney is that the government views taxis as a form of public transport, and regulates the industry with the objective of providing households across the city with universal or equal access to taxis services with only short waiting times. This was a major concern of some members of the Select Committee of the NSW Legislative Council Inquiry into

the taxi industry. To achieve this objective, the government gives the networks powers to direct taxi drivers to take any jobs that arise in a prescribed area along with performance requirements for the networks.

## Universal or equal access for taxi services

There are five questions to be answered with respect to the universal-access objective.<sup>11</sup>

- What does the principle of universal or equal access for taxi services mean?
- Is this a reasonable principle?
- Does the present regulatory regime for taxi services provide approximately universal or equal access?
- Can a regulated regime provide universal or equal access?
- Would deregulation provide more universal or more equal access?

What does the principle of universal or equal access to taxi services mean?

A starting definition of universal or equal access could be that all members of a community would have similar levels of access, defined perhaps as waiting times, and pay similar fares for a basic and safe taxi service. This definition would presumably allow fares to vary with distance and by time of day or night. This would allow discrimination against people who want to travel long distances or at night.

However, 'community' and 'basic service' need to be defined. Presumably, the principles apply to people within a defined urban area. Thus all people within Sydney should have equal access, but all people in Coffs Harbour could have a different level of access. Would a 'basic service' involve an average waiting time of 10 or, say, 15 minutes?

Is the principle of universal or equal access for taxi services reasonable?

The principle of universal or equal access for taxi services (or indeed to other public-transport services) sounds reasonable, but there are strong reasons why it may be accepted only with qualifications.

First, demand and supply conditions may vary greatly within an urban area. In areas of low population or employment density, the cost per taxi trip is likely to be higher because of greater driver waiting time. If a household locates in

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<sup>11</sup> These questions do not deal with the special case of wheelchair-accessible taxis, which raises further issues.

an area where taxi costs are high, they cannot expect levels of service or prices similar to those in an area where taxi costs are low. Presumably, equality of access should be qualified by some consideration of costs.

Second, it is questionable whether public-transport disadvantage is a separate category of household disadvantage. Households on any given level of income can choose less housing and better public transport or more housing and less public transport. Certainly the latter group has chosen less public transport, but the two households have equal real income. Of course income-disadvantaged households have less of both housing and public transport. But the underlying disadvantage is income, rather than transport. A policy that addresses transport disadvantage separately is horizontally inequitable: it is not treating like households in a like way.

**Does the present regulatory regime for taxi services actually provide (approximately) universal or equal access?**

The current regulatory regime in Sydney does *not* provide universal or equal access. There are numerous examples of taxi drivers selecting their passengers and ignoring those that are less-profitable or unwanted. IPART (2009) reported that in 2008–09 taxi drivers rejected 34.6 million booking requests from radio networks and accepted only 10.1 million jobs. For each job accepted taxi drivers turned down three jobs, although they presumably had no passenger at that time. The full reasons are not known. Media stories suggest that it is far harder to get a taxi in outer suburban areas than in inner-city areas. And it is well known that taxi drivers routinely drive around at night with doors locked and windows virtually closed, and select passengers to preferred destinations, often turning down requests for short trips. This selection of passengers is inconsistent with the principle of universal or equal access.

**Is it possible for a regulated regime to provide universal or equal access?**

The lack of access for some people is directly related to the regulated nature of the industry.

The lack of access to taxis that people in Sydney experience reflects three related factors: barriers to entry due to the licence fee and the prohibition on independent businesses; the excess demand for taxi services in peak hours; and price regulations that do not reflect the real costs of taxi operations.

The barriers to setting up a taxi business restrict the services supplied to lower-demand areas of Sydney. They also create the excess demand for taxis in virtually all areas in peak hours. The regulation of prices makes long taxi trips

more profitable than short ones. When there is excess demand, or even when there is a choice of passengers at other times, taxi drivers try to choose the more-profitable trip.

Thus the lack of access for some people is directly related to the regulated nature of the industry. The regulation that requires taxi radio networks to serve the whole metropolitan area within 15 minutes, even with off-loading to another network, is ineffective and unrealistic. In any case, booked services represent only 16 per cent of all taxi trips.

Could industry regulations be redesigned to ensure equal access? It is hard to see how this can be done. There are limits to the extent that a regulator can order taxi operators or drivers to provide an unprofitable service. So long as entry is restricted and fares are regulated, taxi services will not be universal. Taxi drivers will attempt to select the most profitable passenger(s) and discriminate against the others. Indeed, fare regulations alone would cause taxi drivers to refuse some demands for trips for which passengers would be willing to pay but cannot do so under the maximum fare regulation.

**Would deregulation provide more universal or more equal access?**

OECD (2007) concludes that deregulation of entry and industry structure provides more widespread and universal services. Given the level of excess demand for taxi services at present, as evidenced by the size of the licence fee, complete deregulation of entry would probably increase taxi services by at least 20 per cent to 30 per cent in two to three years (Abelson 2010). The market would be far more competitive and driven by user demands.

If, as part of a reform package, fares were deregulated but publicly advertised, fares would tend to reflect taxi costs. This could increase prices for some groups; for example, elderly people who travel short distances. But this would enhance access in that taxi drivers would not discriminate against these groups. However, if equal access is defined as equality of fares across all trips, greater fare variations would be regarded, by definition, as less equal access.

## **Evaluating the Costs and Benefits of Taxi Deregulation**

This section evaluates the net benefits of free entry into the industry subject to operators and drivers passing basic safety checks. Entry deregulation would doubtless produce higher benefits if accompanied by other deregulatory policies, including allowing taxi operators to choose type of taxi vehicle and communication system and to operate as independent competitive businesses.

Prices could be set competitively and vary by time and place subject to publication on a common website. The extra competition could generate an array of new services and prices and cost savings (see Swan 1979). The evaluation assumes that the networks could not use their quasi-monopoly power to thwart free entry. However, these complementary deregulatory policies are not formally defined or assessed in this evaluation.

## Evaluation principles

Following standard economic principles, any departure from a competitive equilibrium is likely to waste economic welfare (create 'deadweight loss') and moves to a competitive equilibrium to provide an equivalent economic gain. These principles are developed in the four figures below. Figure 3 shows two perfectly elastic supply schedules. With initial supply ( $S_1$ ), the fare ( $F_1$ ) is the average cost (AC) of a taxi trip plus the licence fee (LF). The demand for taxi trips is given by schedule  $D_1$  and there are  $Q_1$  taxi trips per period. With no licence fee, the fare falls to  $F_2$ . Also, the demand curve shifts right to  $D_2$  as more taxis enter the market and customer waiting times fall. The fall in fares for existing consumers is a transfer from taxi suppliers to users. However, existing users also gain surpluses equal to area A due to lower waiting times. New users gain consumer surpluses equal to areas B + C + D.

**Figure 3: User benefits from increase in taxi services and lower fares**

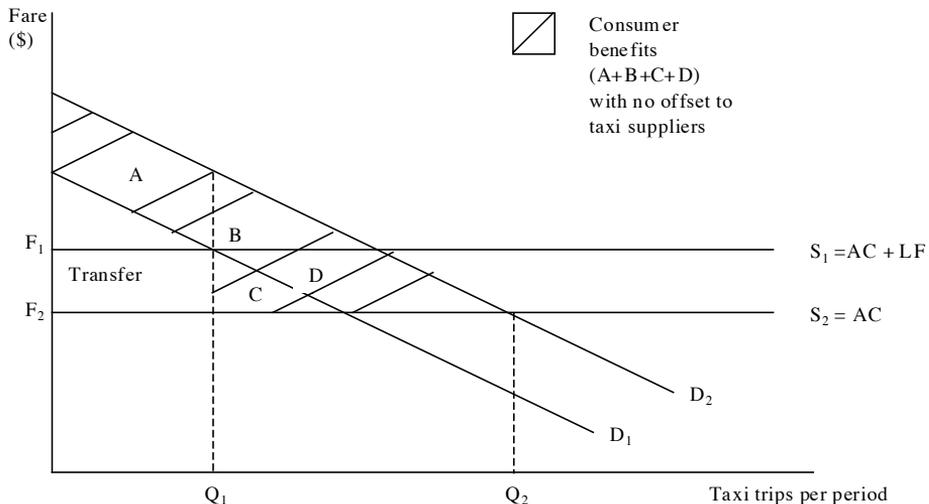


Figure 4 provides an equivalent exposition, drawing on the concept of generalised cost (GC) that is often employed in transport economics. This

facilitates quantitative estimates. The demand for taxi trips is shown as a function of GC which is the sum of the fare and the user cost of waiting time. In this figure:

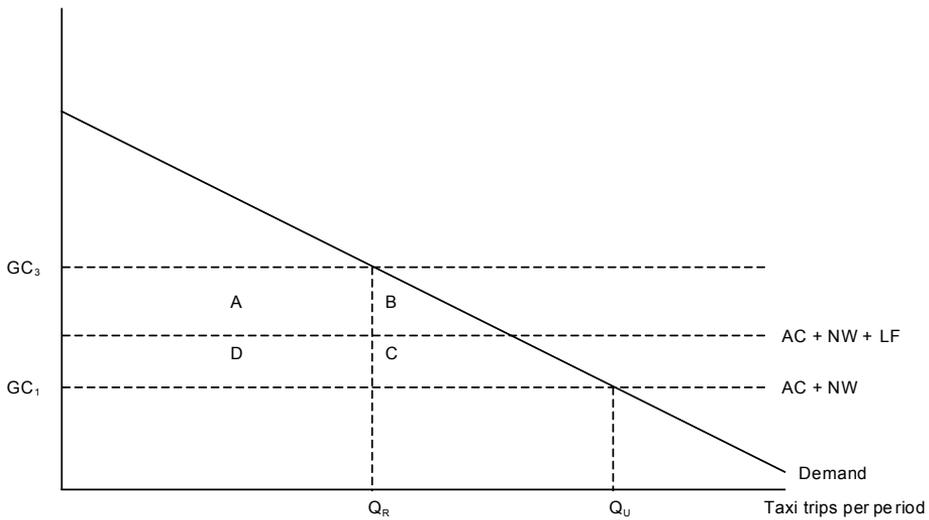
$GC_1 = AC + NW$ , where NW is normal waiting time (i.e. average waiting time with no entry restrictions).

$GC_2 = AC + NW + LF$ .

$GC_3 = AC + NW + LF + EW$ , where EW is excess waiting time.

In Figure 4,  $Q_R$  is the number of taxi trips with restricted entry and  $Q_U$  the trips with unrestricted entry. With unrestricted entry, there is no excess waiting time or licence fee and generalised cost falls from  $GC_3$  to  $GC_1$ .

**Figure 4: Basic economic benefits: alternative exposition**



The gross benefits of deregulation to existing taxi consumers equal areas (A + D). The benefits to new users are areas (B + C). Thus gross user benefit = A + B + C + D. However, the fall in taxi fares associated with area D is a loss to taxi owners. Thus the net social benefit equals areas (A + B + C).

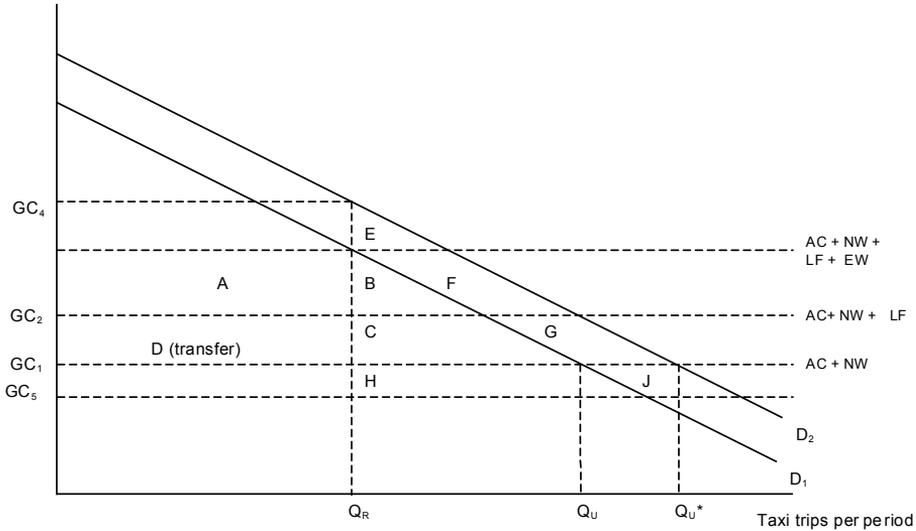
Figure 5 introduces two complications. First, the observed number of trips ( $Q_R$ ) at  $GC_3$  in Figure 4 does not represent the true demand for taxis at this price. Many people do not use taxis in peak hours because actual waiting time may substantially exceed mean waiting time or indeed because no taxi may be available at the required time. That  $GC_3$  is not an equilibrium price is evidenced by IPART agreeing with a Taxi Council proposal that a premium of up to \$11 on the fare be allowed for undefined 'premium' services. This indicates that real

demand exceeds observed usage. This is reflected in the  $D_2$  demand curve in Figure 5. Given this demand and a deregulated generalised cost of  $GC_1$ , usage would now rise to  $Q_U^*$ .

Second, the social cost of a taxi trip differs from average (private) cost. The private cost includes indirect taxes (excise taxes and GST) and road tolls, which are transfer payments and not resource costs. On the other hand, taxi trips have some negative externalities (notably traffic congestion and air-quality effects). Given that the estimated indirect taxes exceed the negative externalities (see below), the long-run marginal social cost inclusive of externalities (LRMSC) + NW line is drawn below the AC + NW line. It is assumed that fares must overall cover long-run marginal cost.

In Figure 5, the benefits of deregulation to existing taxi users still equal areas (A + D). Discounting the loss to taxi suppliers, the net social benefit remains area A. However, the benefits of generated trips are now greater. The benefits to users equal areas (B + C + E + F + G). The other net benefits to society equal areas (H + J). This is the excess of government revenue and road tolls over the environmental costs of taxi trips.

**Figure 5: Adding evaluation complications**



Finally, we introduce differential pricing in peak and off-peak hours. With unregulated pricing, peak fares would likely exceed average unit cost in peak hours so as to equate supply with peak demand. In off-peak hours, fares would be closer to marginal operating cost.

**Figure 6: An off-peak model**

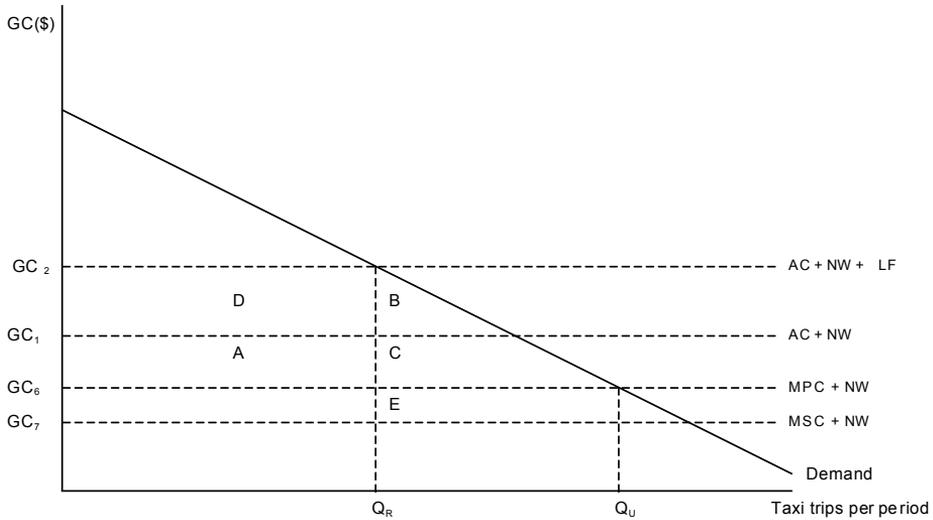


Figure 6 depicts an off-peak scenario. Demand is lower and it is assumed that there is no excess waiting time. It is also assumed that fares will fall, as the private marginal cost (PMC) of operating in off-peak hours does not include fixed vehicle costs. Thus  $GC_6$  is lower than  $GC_1$  and taxi use ( $Q_U$ ) is determined by the intersection of the demand curve with  $GC_6$ . Again, marginal social cost (MSC) is lower than PMC.

In this off-peak model, existing taxi consumers gain benefits equal to areas (A + D). However, in this case both areas A and D are offset by losses to taxi drivers (who make higher returns in the peak periods). On the other hand, benefits to new consumers equal areas (B + C). Net social benefits equal area E.

In the evaluation below, peak-hour effects are evaluated based on Figure 5 assuming that the fare will remain at  $AC + LF$ . Off-peak hour effects are based on Figure 6. Based on discussions with taxi drivers, peak hours constitute a third of operating hours per week (40 of the working 120 hours) and taxis do twice as many paid trips in a peak hour as in an off-peak hour. This implies that peak hours account for half of all existing trips in Sydney (30 million per annum) and off-peak hours for the other half (also 30 million trips per annum).

## Estimated Net Benefits of Taxi Deregulation in Sydney

For the evaluation of taxi deregulation, estimates are needed of taxi trip costs, fares and waiting time in peak and off-peak periods, a peak-period equilibrium fare, social costs and benefits, and the elasticity of demand with respect to generalised costs. The detailed data and estimates (based on 2007–08 data and prices) are shown in the Appendix. I comment here briefly on the basis for these estimates.

IPART (2008) estimated that the average (producer) cost of a taxi trip in 2008 was \$20.20 and the cost of the licence fee per trip was \$2.43. However, in an unregulated market, peak-hour fares would likely be above average cost and off-peak fares below average cost. In the absence of data that would enable modelling of these prices, I assume that taxi drivers would continue to charge LF (\$2.43 per trip) in peak hours even though it would no longer be a cost but that off-peak fares would fall by the same amount below average cost. Given equal peak and off-peak trips, this ensures revenue neutrality for taxi operators.

The average waiting time for all phone-booked taxis in 2008 is 8.3 minutes (IPART 2008). For this evaluation, a 'normal wait time' with a deregulated taxi fleet is assumed to average five minutes. This is 3.3 minutes below the average time. Given an equal number of peak and off-peak trips, the average excess wait time in peak hours is therefore 6.6 minutes per taxi (making an average wait of 11.6 minutes in peak hours).

Waiting time is usually related to income. The average weekly income in 2008 was \$1145 (ABS 6302.0). This equals \$30.5 an hour for a 37.5 hour week. In-vehicle leisure time is usually valued at 33 per cent of hourly wage, but waiting time is valued at up to twice this amount (UK Department for Transport 2010). This suggests that non-working waiting time for taxis would be valued at \$20 per hour per passenger. However, working time is usually valued at the wage rate. For business users of taxis this may be above the national average wage rate, so we allow \$40 an hour. Allowing for two-thirds leisure and one-third business users, the weighted average could be  $(0.67 \times \$20) + (0.33 \times \$40) = \$27$  per hour.

Allowing for 1.8 passengers per taxi, this would be \$48.6 per hour or \$0.81 per minute. Thus the average cost of five minutes waiting is \$4.0 per taxi. The cost of 11.6 minutes waiting is \$9.3 per taxi.

Estimating the market clearing price with current regulations ( $GC_4$  in Figure 5) is also problematic. The taxi industry has argued for an additional \$11 per trip for

undefined premium services (presumably in peak hours). For this exercise, the average market clearing price premium in peak hours is assumed conservatively to be half of this (i.e. \$5.50 per trip).

To estimate the third-party effects, the GST component (\$1.84) of the average fare is taken out of AC. However, environmental and congestion costs are included.<sup>12</sup> Allowing \$0.10 per vehicle km for these costs @ 7 km per trip, these costs are \$0.70 per taxi trip.

To estimate generated taxi trips I allow a price elasticity of demand with respect to generalised cost of  $-1.0$ , based on Toner and Mackie (1992) and OXERA (2003). This is an average elasticity. Arguably the elasticity could vary for fares and waiting time and for peak and off-peak hours.

## Summary of results

Table 3 shows estimated benefits and costs of entry deregulation in Sydney. On plausible and quite conservative assumptions about waiting times and other costs, the estimated net gain is \$265 million per annum. While detailed sensitivity tests have not been attempted, there is no reason to doubt that this estimate represents a reasonable order-of-magnitude estimate of the gain from entry deregulation. Over 20 years, with unchanged demand and supply conditions, this produces a net benefit with a present value of \$2.8 billion (assuming a real discount rate of 7 per cent per annum, the NSW Treasury recommended discount rate). This is consistent with the estimated capitalisation of rents figure quoted above.

These benefits are based on free entry into the industry and price flexibility. They may require some concurrent reduction in the power of the networks over the industry. As OXERA (2003) reported, total expected benefits of deregulation were not obtained in the United States because the reforms did not address the oligopolistic nature of industry. If taxi operators were free to compete and develop their own competitive brands, there would almost certainly be additional service and productivity gains.

In the distribution of the gains, consumers are estimated to obtain annual benefits of \$295 million and there would be small gains to government revenue. On the other hand, taxi industry suppliers would lose an estimated \$51 million a year.

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<sup>12</sup> Arguably, the GST component of the fare should not be included as a benefit to government because government may lose GST on expenditure forgone to make a taxi trip. On the other hand, any excise tax and road tolls associated with generated trips should be included as a benefit to the recipients. These have not been allowed for in these calculations.

Owners of taxi licences would lose annual licence fees of about \$140 million. But with deregulated pricing, taxi operators are assumed to retain peak-hour fares and so they would gain the LF component of fares in peak hours.

Deregulation of entry into the industry would have two other noteworthy equity effects. First, it would promote employment. Each taxi licence issued creates at least 2.7 equivalent full-time jobs (because taxis are driven about 6000 hours in a year). This assists people (including students and retirees) who want to supply taxi services without having to pay \$12 000 a year for their share of the licence to provide a service. Second, deregulation would assist low-income and elderly people who do not own or cannot drive private vehicles. Taxis play an important role in providing transport to individuals for whom other forms of public transport are not suitable.

## Policy Questions

Given these results and others in the international literature, why have such strong regulations been retained in Sydney and elsewhere in Australia? There seem to be several possible explanations. First, one explanation is that the policymakers have little exposure to economic arguments. This appears to be a strong possibility.

Second, policymakers may believe that the analysis is flawed. Clearly, the estimated benefits of deregulation are based on a large number of inputs and assumptions. There is some international evidence that poorly constructed packages of reforms may be ineffective (Moore and Balaker 2006). Certainly some regulations need to be retained. However, it would be hoped that policymakers would recognise that the underlying theory and evidence are robust and that large gains could be realised from deregulation of the taxi industry. In a wide-ranging review of international experiences with deregulation, the OECD (2007: 8) concluded that: 'Post-reform evidence generally demonstrates strongly positive results measured against a range of criteria. Substantially increased taxi numbers mean customer waiting times tend to fall substantially, while customer satisfaction levels have also substantially improved'.

Third, policymakers may believe the analysis is incomplete because the reforms would not meet the public transport objective of 'universal and equitable access'. In reviewing this objective, we found that this concept is poorly defined and that competitive markets with light regulation are more likely to achieve general and equitable access than a strongly regulated taxi industry.

**Table 3: Summary of results**

<b>Estimated annual benefits in peak hours</b>		<b>\$m</b>
Existing users lower waiting time (Area A)	$Q \text{ existing} \times (GC3 - GC2)$	157.2
New user benefits (Areas B + E + F)	$Q \text{ new} \times (GC4 - GC2) \times 0.5$	49.5
Taxi supplier gains new users (Areas C + G)	$Q \text{ new} \times (GC2 - GC1)$	22.3
New social benefits (Areas H + J)	$Q \text{ new} \times (GC1 - GC4)$	10.4
Total benefits		239.4
<i>Transfers</i>		
To suppliers: higher peak hour fares	$Q \text{ existing} \times GC2 - GC1$	72.3
<b>Estimated annual benefits in off-peak hours</b>		
New user benefits (Areas B + C)	$Q \text{ new} \times (GC2 - GC6) \times 0.5$	14.7
New social benefits (Areas J + K)	$Q \text{ new} \times (GC6 - GC7)$	11.1
Total benefits		25.7
<i>Transfers</i>		
Existing users lower fares (Areas D + A)	$Q \text{ existing} \times (GC2 - GC6)$	146.0
<b>Summary results: all users and suppliers</b>		
Gains to taxi users	No offsetting losses	221.3
Gains to taxi suppliers	No offsetting losses	22.3
Social benefits	No offsetting losses	21.5
Total net benefits per annum		265.1
<i>Transfers per annum</i>		
Supplier gains from higher peak fares		72.3
Supplier losses from lower off-peak fares		146.0
Net gain to consumers (loss to producers)		73.7
<i>Total annual impacts</i>		
Gains to consumers		295.0
Losses to taxi industry suppliers		-51.4
Social gains		21.5
Total net benefits		265.1

Fourth, my discussions with regulators suggest that policymakers may favour the NSW type of regulatory structure because it outsources the onerous tasks of monitoring and controlling taxi drivers to a few networks. This minimises in-house administration and responsibility. However, outsourcing regulatory responsibility to the networks makes a major service supplier also an industry regulator. This creates conflicts of interest, inhibits competition and sets up unhealthy relationships between suppliers in the taxi industry. The end result has all the symptoms of regulatory capture.<sup>13</sup>

The fifth, and possibly most common, explanation for opposing reform is that the social costs of deregulation are unacceptable. The major losers from free entry would be investors in taxi licence plates. This small group has a large interest in opposing change compared with the dispersed benefits to taxi users. It is generally accepted that there is no legal requirement to compensate taxi-plate holders for any reduction in the value of the plates (Deighton-Smith 2000). The size of compensation, if any, is therefore a political decision. This decision may be informed by evidence about past purchase prices, returns on investments since purchase and hardship issues. If any compensation is considered necessary, it could be at less than current market values.

Be that as it may, several strategies could reduce the cost to government (see also Deighton-Smith 2000; Johnston 2000).

Government may adopt a gradual reform process over, say, 10 to 15 years. This allows plate holders to continue to gain significant income and government to offer lower compensation in the longer term. However, this delays the substantial benefits of taxi reform and risks an about-turn on the reform process.

1. Another strategy for reducing costs to government would be to maintain regulated taxi fares in the peak or even allow them to increase, notwithstanding an increase in taxis. This would soften the fall in value of taxi plates. Taxi users would still be better off on a net basis because of the fall in waiting times in peak hours.
2. The next two strategies are variations on a buy-back strategy. When government buys back a licence, it would lease it out on the market and the lease revenue would partly offset the cost of the buy-back.

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<sup>13</sup> Some analysts might argue that regulatory capture has not been simply an end-product of outsourcing responsibility for implementing regulations but a result of overly close relationships between the major taxi network company (Cabcharge) and ongoing governments of NSW (see, for example, <http://www.smh.com.au/interactive/2009/taxis/index.html>). The chairman of Cabcharge for over a decade has been an ex-premier of the State of NSW and in 2009 the Secretary of the then Ministry of Transport with responsibility for oversight of the taxi industry resigned and took up employment with Cabcharge. However, the author has no evidence of improper behaviour.

3. Government would buy back all licences at a discounted cost of say \$330 000 or less per licence over, say, three years and lease them out at rates falling from \$25 000 towards \$0 per annum over 10 to 15 years. Government would issue annual increases in licences in line with these falling rates. Plate sales to government would be optional but would be in the owner's interest given the falling lease rates.
4. Another strategy would combine a rights issue with a buy-back. The government would substantially increase the plates in the market by an annual rights issue. In a tested scenario, all existing licence holders receive a 10 per cent increase in their holding, free of charge for four years, and a 3 per cent annual increase thereafter. The plate holders can either sell this entitlement on the market to an amalgamator or sell it back to the government at a discount rate. The government would also buy back full plate licences at a discount to the market. As in strategy (3), the government would lease out plates at a declining annual price.

The net cost to government would depend on scheme detail. However, modelling of these strategies by the author indicates that the net cost to government could be less than 50% of the cost of full market price buy-back of licences. The cost would be lower if strategy (3) or (4) were combined with maintaining or even increasing peak fares, as in strategy (2). Thus, if compensation is deemed necessary, a combination of (2) and (3) or (4) could substantially reduce the cost to taxpayers while gradually producing considerable benefits of taxi users.

Finally, a brief comment on the impacts of deregulation on taxi drivers is needed. Many taxi drivers oppose any increase in entry apparently because they fear that their already low earnings will be further eroded. However, the monopoly rents accrue to licence holders, not to taxi drivers. Driver income is driven by the demand and supply of drivers. Many long-time Sydney taxi drivers have experienced real falls in income in recent years because the supply of drivers has increased, especially with the influx of immigrants and foreign students. Driver incomes have fallen to a new low equilibrium as drivers compete for work by bidding up pay-in rates. However, as Swan (1979) pointed out, an increase in taxis will *increase* the demand for taxi drivers, reduce pay-in shift rates and increase take-home earnings. The increase will be positive but small because the driver supply curve is upward-sloping but highly elastic. In addition, the ability of a taxi driver or small group of drivers to establish their own business and brand in a deregulated market could significantly increase driver income.

## Conclusions

Numerous regulations govern entry, industry structure, service quality and prices for the Sydney taxi industry. Similar regulations are in place in other Australian cities.

However, there are few market failure (efficiency) reasons for regulations other than basic safety regulations. Nor do the regulations achieve a possible public-benefit objective of universal and equitable access to taxi services across the city.

On plausible assumptions, the net benefits from free entry into the Sydney taxi industry are in the order of \$265 million per annum. The productivity and service benefits would doubtless be greater if other restrictions on taxi services were lifted, especially the anti-competitive control of the taxi radio networks over taxi operators and drivers.

Although other Australian and international reports have reached similar conclusions, the NSW government (like other Australian governments) resists making reforms. The main reasons for this appear to be a lack of understanding of the benefits of market operations, a policy preference for outsourcing regulation to a few industry players and concerns about the social costs and claims for compensation (although there is no legal basis for compensation). However, the paper also shows that various strategies could achieve reform (and the benefits of reform) and minimise compensation costs.

## References

- Abelson, P. 2008, *Public Economics, Principles and Practice*, 2nd ed., McGraw-Hill, Sydney.
- Abelson, P. 2010, *Economics of Taxi Industry Reform in Sydney*, Submission No. 30 to the NSW Legislative Council *Inquiry into the NSW Taxi Industry*. Available at: [www.parliament.nsw.gov.au/Prod/parlament/committee.nsf/V3ListSubmissions?open&ParentUNID=EA4E5B85CBE5CF0CCA25766B00114E9A](http://www.parliament.nsw.gov.au/Prod/parlament/committee.nsf/V3ListSubmissions?open&ParentUNID=EA4E5B85CBE5CF0CCA25766B00114E9A)
- Bekken, J-T. 2007, 'Experiences with (De-)Regulation in the European Taxi Industry' in OECD, *(De)Regulation of the Taxi Industry*, Round Table 133, OECD, Paris: 31–58.
- Cairns, R. C. and Liston-Heyes, C. 1996, 'Competition and regulation in the taxi industry', *Journal of Public Economics* 59: 1–15.

- Colmar Brunton 2003, *2002 National Taxi Users Survey Report*, prepared for Department of Transport, Western Australia. Available at: [www.transport.gov.au](http://www.transport.gov.au)
- Cook, A. 2005, *Ministerial Inquiry into the Taxi Industry, Interim Report*. Available at: [www.transport.gov.au](http://www.transport.gov.au)
- Deighton-Smith, R. 2000, *Reforming the Taxi Industry in Australia*, Staff Discussion Paper, National Competition Council, Melbourne.
- Dempsey, P. S. 1996, 'Taxi industry regulation, deregulation and reregulation: an analysis of taxi markets', *Transportation Law Journal* 24(1): 73–120.
- Diamond, P. 1971, 'A model of price adjustment', *Journal of Economic Theory* 3: 156–68.
- Independent Pricing and Regulatory Tribunal (IPART) 2008, *2008 Review of Taxi Fares in NSW*, IPART, Sydney.
- Independent Pricing and Regulatory Tribunal (IPART) 2009, *2009 Review of Taxi Fares in NSW*, IPART, Sydney.
- Johnstone, A. 2000, 'Taxi industry reform? Should there be compensation?' *Agenda* 7: 171–83.
- Liston-Heyes, A. and Liston-Heyes, E. 2007, 'Regulation of the Taxi Industry: Some Economic Background' in OECD, *(De)Regulation of the Taxi Industry*, Round Table 133, OECD, Paris: 91–113.
- Ministry of Transport and Infrastructure 2008, *Guide for Authorised Taxi-cab Network Providers and Taxi-cab Network Services Standards for the Sydney Metropolitan, Newcastle and Wollongong Transport Districts and the Local Government Areas of Gosford and Wyong*. Available at: [www.transport.gov.au](http://www.transport.gov.au)
- Ministry of Transport and Infrastructure 2010a, *Release of New Annual Taxi Licences from 1 July 2010*.
- Ministry of Transport and Infrastructure 2010b, *Taxi Licensing Changes for New South Wales*.
- Moore, A. T and Balaker, T. 2006, 'Do Economists reach a Conclusion on Taxi Deregulation?' *Econ Journal Watch* 3: 109–32.
- National Competition Council 2000, *Improving Our Taxis*, NCC, Melbourne.
- Nicholls, D. 2003, *The Role of the Public Interest in the Application of the National Competition Policy to the Australian Taxi Industry*, ANU, Canberra.

- OECD 2007, *Taxi Services Regulation and Competition*, Directorate for Financial and Enterprise Affairs, OECD, Paris.
- OXERA 2003, *Taxi Markets Literature Review, Annexe G*, prepared for the UK Office of Fair Trading, London.
- Productivity Commission 1999, *Regulation of the Taxi Industry*, Commission Research Paper, Ausinfo, Canberra.
- Swan, P. 1979, *On Buying a Job: the Regulation of Taxicabs in Canberra*, Policy Monograph, Centre for Independent Studies, Sydney.
- Teal, R. F. and Berglund, M. 1987, 'The impact of taxicab deregulation in the USA', *Journal of Transport Economics and Policy* XXI(1): 37–56.
- Toner, J. P. 1996, 'English experience of deregulation of the taxi industry', *Transport Reviews* 16(1): 79–94.
- Toner, J. P. and Mackie, P. J. 1992, 'The economics of taxicab regulation: a welfare assessment', paper presented to the Sixth World Conference on Transport Research, Lyon.
- UK Department for Transport 2010, *Values of Time and Operating Costs*, Transport Analysis Guidance, TAG Unit 3.5.6, London.
- UK Office of Fair Trading 2003, *The Regulation of Taxi and PHV Services in the UK*.

## Appendix: Base data of the Evaluation

### Quantity of taxi trips in Sydney

Total taxi trips per annum (m)	59.8
Persons per taxi trip	1.8
Average trips per taxi per annum	11 730
No. of taxis in Sydney	5100
Total shifts per week	11.5
Paid taxi trips per shift	20
Hours per shift	10.5
Weeks per year	51
Operating hours per week	121
Peak hours Monday to Thursday	24
Peak hours Friday	9
Peak hours Saturday	7
Total peak hours	40
Peak hours as % all business hours	33
Peak hour/off-peak hour trip ratio	2
Trips in peak hours as % all trips	50
Existing peak hour trips p.a. (m)	30
Existing off-peak hour trips p.a. (m)	30
Elasticity of demand as f (change in GC)	-1
New peak hour trips p.a. (m)	9
New off-peak hour trips p.a. (m)	6
Total trips p.a. with free entry (m)	75
Total trips p.a. with free entry (% increase)	25

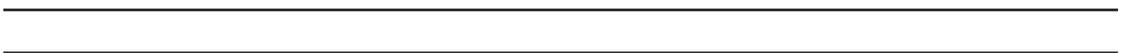
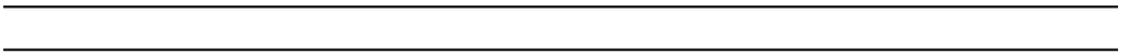
### Cost data (a)

Average fare (\$)	F	20.20
Licence fee per trip (\$)	LF	2.43
Average cost (\$)	$AC = F - LF$	17.77
Value of wait time per taxi (\$/minute)	VWT	0.80
Normal wait time (minutes)	NWT	5.00
Excess wait time (minutes)	EWT	6.60
Equilibrium premium price (\$)	X	5.50
Cost of normal wait time (\$ per taxi trip)	$NW = NWT \times VWT$	4.00
Cost of excess wait time (\$ per taxi trip)	$EW = EWT \times VWT$	5.28
GST (\$ per taxi trip)	Excise excluded	1.84
Externality cost (\$ per taxi trip)	Ecost	0.70
LRMSC	$AC + NW - GST + Ecost$	16.63
Fixed cost as % of total cost		35
Variable costs as % total cost		65

<b>Average generalised costs in peak hours</b>		( $\$$ )
GC1	AC + NW	21.77
GC2	AC + NW + LF	24.20
GC3	AC + NW + LF + EW	29.48
GC4	GC3 + X	34.98
GC5	LRMSC + NW	20.63
 <b>Average generalised costs in off-peak hours</b>		 ( $\$$ )
GC1	AC + NW	21.77
GC2	AC + NW + LF	24.20
GC6	AC - LF + NW	19.34
GC7	AC - LF + NW - GST + Ecost	17.50

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# ***ARGUMENT***





# An Economic Unravelling of the Precautionary Principle: The Queensland Wild Rivers Act 2005

STEPHEN ILES AND GARY JOHNS<sup>1</sup>

## Abstract

*The paper assesses the application of the precautionary principle in the Queensland Wild Rivers Act 2005. It finds that the Act is more restrictive than the ecologically sustainable development principles as conceived, and deployed, by the Queensland Government elsewhere. At the same time the Act is injurious to property rights, unnecessarily restricts future development options, and does not allow for assessments of non-environmental values or the cost of options forgone. As a result the Act has severe consequences for the Cape York economy and increases the risk of perverse consequences for the environment.*

## Background

Cape York Peninsula contains the largest areas of natural environment in eastern Australia within a land space slightly larger than Victoria. Unlike Victoria, which accommodates five million people at a high average standard of living, Cape York houses just 13 000 people, the vast majority of whom live on welfare. Indigenous people make up more than 50 per cent of the population and own and/or control more than six million hectares, representing 45 per cent of Cape York's 13.7 million hectares.<sup>2</sup> There is a major Welfare Reform program taking place on Cape York, designed to break widespread passive-welfare dependence and boost individual economic independence. In support of this major reform,

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<sup>2</sup> Balkanu Cape York Development Corporation (unpublished correspondence).

the Queensland and Australian governments have contributed \$100 million over four years. Nevertheless, the inhabitants are generally poorly equipped to face the serious environmental and economic threats to Cape York's biodiversity posed by invasive cane toads, wild pigs and other feral animals and grasses which impose great cost on Cape York.

An early attempt to satisfy the competing interests on Cape York had various interest groups sign the Cape York Heads of Agreement. The Cape York Land Council, The Wilderness Society, the Australian Conservation Foundation, the Cattlemen's Union and (some years later) the Queensland Government agreed:

All parties are committed to work together to develop a management regime for ecologically, economically, socially and culturally sustainable land use on Cape York Peninsula, and to develop harmonious relationships amongst all interest in the area. (Cape York Heads of Agreement 1996)

In 2005, the Heads of Agreement strategy was superseded, however, by the introduction of the Wild Rivers Act, legislation proposed by conservation groups in return for political support to the Queensland Government. More than a third of the total Cape York Indigenous estate is now designated for conservation purposes, mostly as national parks and nature refuges.<sup>3</sup> The strategy behind the Wild Rivers Act appears to assume that the future of Cape York will be based on limited types of tourism and government transfers (environmental welfare),<sup>4</sup> and that future residents will be unable to manage and develop land both to create wealth and preserve or indeed enhance the environment of Cape York. The Act has proved politically contentious and in 2010 the Federal Opposition vowed to introduce a Bill to the Commonwealth Parliament with the aim of overriding the Queensland legislation.

## The precautionary principle

The Queensland Government seeks to protect the environment from future actions adverse to the environment. In doing so, it has drawn on the concept of Ecologically Sustainable Development (ESD) (Brundtland 1987), the widely accepted approach to jointly managing in the interests of the environment and development so as to protect the enjoyment of future generations in the environment. In order to achieve the desired balance of interests invoked by ESD, however, it is essential to apply some rule to manage the risk to the

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3 Ibid.

4 A trial of 20 Wild River Rangers is under way across the Gulf and the Cape, with a total commitment of 100 rangers to eventually cover the entire Gulf and Cape declared Wild Rivers (Queensland Government 2009d).

environment that development may bring. The widely applied rule is that of the precautionary approach or precautionary principle. The Queensland Government has applied this principle in its Wild Rivers Act.

At its simplest, the precautionary principle advises that a proponent should proceed with caution before undertaking an action where there is risk of possible harmful outcomes. Following Cussens (2009) and Soule (2000), it is clear that the apparently simple principle is not so simple after all. The principle, although widely invoked, does not necessarily assist in managing risk. For example, a widely accepted definition of the principle is known as the Wingspread Statement:

When an activity raises threats of harm to the environment or human health, precautionary measures should be taken, even if some cause-and-effect relationships are not fully established. (quoted in Cussens 2009: 67)

The difficulty with the statement is that there is no definition of three crucial elements: threat of harm, uncertainty about risks and causal relationships, and the level of precaution in response to the threat. Cussens suggests that if threat of harm is taken to mean the actual risk of an activity, then the principle says too little; it is reduced to a cliché that tells us, 'when there is evidence of hazard, it is prudent to take care'. If, on the other hand, 'threat of harm' means the public perception of hazard, then the precautionary principle says too much; it can be invoked to slow or stop innovative, and possibly very beneficial, products or procedures, on the basis of lack of evidence (Cussens 2009: 67). To illustrate the bias of the principle, Cussens (2009: 69) formulates an alternative proposition: 'When a lack of activity raises a threat of harm to wealth creation, precautionary measures should be taken, even if some cause-and-effect relationships are not fully established.'

As Cussens argues, the statement has all the flaws of the Wingspread definition, but is nevertheless its 'logical equivalent'. Both are precautionary principles; where Wingspread has human and environmental health as its fundamental value, Cussens' version has wealth creation. Cussens' purpose is to illustrate that both versions are too vague to be practically applicable and that the usual version of the precautionary principle is value laden in what might be called a 'green' direction: 'A principle that is presented by its proponents in the guise of a value neutral guide to policy-making in the face of uncertainty is nothing of the kind.' (Cussens 2009: 69).

## ESD and the application of the precautionary principle in Australia

Perhaps reflecting the insight that the precautionary principle is value laden, one of the premier international environmental organisations, the International Union for the Conservation of Nature (IUCN), recently published guidelines (IUCN 2007: 6) for applying the precautionary principle to biodiversity conservation and natural-resource management. Crucially, the guidelines suggest that the principle be integrated with other relevant principles and rights. The IUCN cautions that other principles and rights, including intergenerational and intragenerational equity, the right to development, the right to a healthy environment, and human rights to food, water, health and shelter must be borne in mind when applying the precautionary principle:

In some circumstances these other rights may strengthen the case for precautionary action. In other circumstances, the Precautionary Principle may need to be weighed against these other rights and principles, taking into due account the critical nature of the Principle. (IUCN 2007: 6) <sup>5</sup>

It is the contention of the paper that risk and uncertainty can never be avoided for either protection or development choices. For example, given the difficult circumstances of Aboriginal people in the Cape, Aboriginal development and unemployment are both uncertain under the protection and development options. There may be, for example, some irreversible effects of development opportunities lost forever under a stringent application of the precautionary principle. The ESD invoked by the IUCN and the Australian intergovernmental agreement seeks among other things, for example, to balance the needs of Aboriginal people and their desire to attain the living standards of other Australians and the needs of the environment. The difficulty is that the principle does not of itself provide a solution as to how these are to be achieved. The suspicion with Wild Rivers is that the principle is invoked in such a way as to allow the environment to trump the interests of Aboriginal economic aspirations. Rather than resort to such a crude use of the principle, it is possible to use management tools such as cost-benefit analysis to better understand, manage

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<sup>5</sup> Similarly, the national strategy for ecologically sustainable development adopted by the Council of Australian Governments in 1992 (Intergovernmental Agreement on the Environment) was careful to balance various principles and rights including, for example:

- to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations
- to provide for equity within and between generations
- to protect biological diversity and maintain essential ecological processes and life-support systems. (Ecologically Sustainable Development Steering Committee 1992)

and allocate risk and uncertainty. For example, the precautionary approach may encourage research that seeks to build knowledge and remove uncertainty, or apply sensitivity analysis that examines a range of possible outcomes and their response to changes in key variables. Most important, precaution used flexibly may accommodate the advance of knowledge and regulatory processes that require extensive testing to demonstrate reliability of outcome as well as prohibition of potentially damaging activity.

There is no single approach to the application of the principle in Australia. Indeed, Weirer and Loke (2007) count no fewer than 120 pieces of legislation and hundreds of 'non-binding policies' that invoke precaution in Australia, most of which reference the Intergovernmental Agreement on the Environment. The key question is to understand which version of the principle — between flexible and heavily restrictive — has been applied in Cape York under the Wild Rivers Act.

Various attempts have been made to formally classify the Australian approaches. The typology initially developed by Cooney (2004) and subsequently modified by Weirer and Loke (2007) is a good example.

Broad categories are as follows:

- Flexible applications seek to resolve uncertainty and not use uncertainty as a reason to avoid taking action. Cost-effectiveness may be a criterion for determining whether action should be taken.
- Moderately prescriptive responses narrow the field of reference for decision-makers. Cost-benefit analysis and magnitude of impact are less influential.
- Heavily restrictive interpretations discard considerations of cost-benefit. An absolute threshold is frequently established to trigger action, regardless of scale or impact.

Within the broad categories, variants of the precautionary approach (Weirer and Loke 2007), differ over whether:

- a threshold for action is frequently established (often 'serious' or 'irreversible')
- associated costs and benefits are assessed
- action is required by decision-makers
- the burden of proof is reversed onto proponents to demonstrate that harm will not arise.

## Assignment of costs

The five tests summarised in Table 5.1 form the basis of the assessment framework to be applied to the Wild Rivers Act and have been formulated in conjunction with the three broad categories specified above.

## Threshold tests

A trigger for invoking the principle can often be identified. Flexible applications often require an acknowledgement that consequences be sufficiently severe and have a degree of likelihood of occurrence. By contrast, heavily restrictive versions have no such requirement. The 'serious or irreversible' terminology is adopted in the Intergovernmental Agreement on the Environment and accordingly is categorised as flexible.

## Cost-benefit analysis

Cost-benefit analysis is a second test to determine the strength and intensity of precaution in policy, regulation and legislation. The IUCN guidelines, the Intergovernmental Agreement on the Environment as well as the Cape York Heads of Agreement acknowledge the equal importance of conservation, intergenerational equity and economic and social development. An absence of cost-benefit analysis implies a preference for one of the latter three elements.

Irrespective of costs and benefits, an acceptance or assertion that an area has high preservation values can as a separate exercise lead to a search for the most cost-effective way of achieving those values. The IUCN guidelines and the Intergovernmental Agreement specifically cite the requirement for cost-effective responses.

## Burden of proof

Reversal of the traditional burden of proof in relation to potential harm or damage in light of uncertain facts is a readily observed element of restrictive interpretations of precaution. Specifically, heavily restrictive versions require proponents to demonstrate that their proposed actions are entirely free from harm or damage. In contrast, flexible interpretations may not assign a burden of proof but, rather, simply remove uncertainty as a means of forestalling action to prevent harm.

Neither the Guidelines nor the Agreement reverses the burden of proof, requiring developers to demonstrate freedom from harm. The Agreement does, however, call for 'fundamental consideration' of 'biological diversity and ecological integrity'.

## Costs

Consideration of cost is a contested area. Weirer and Loke (2007) discuss the assignment of liability in the event of damage. Heavily restrictive interpretations clearly assign liability to development proponents, while flexible applications may not directly. The Agreement applies the 'polluter pays' principle and calls for developers to bear costs of 'containment, avoidance or abatement'. This paper more critically assesses the broader consequence of costs.

The specific incidence of cost is important. Some communities have greater capacity to bear costs. This fact explains differentiated expectations in climate-change debates. First-world nations, such as Australia and the United States are reasonably expected to incur greater costs now while rapidly industrialising nations, such as India and China, have lower expectations placed on them. Developing nations like Bangladesh have even lower capacities again. The Guidelines identify this aspect when it states the qualification, 'according to their capabilities'.

Attendant to discussion of current costs is consideration of intergenerational cost burdens. Precaution seeks to reduce the costs of damage and harm borne by future generations arising from the present consumption of resources. Flexible versions of precaution that acknowledge the requirement for a balanced treatment of competing aims, such as conservation and development, are keenly aware of intergenerational cost burdens arising from actions that limit either. Also, if sound, ecologically sustainable development is stopped for minor environmental reasons, or for environmental effects that can be mitigated, future generations suffer a loss of potential income (part of which could have been used for environmental protection).

**Table 1: The Comparison of Precautionary Principle applications of Weirer and Loke**

	Flexible	Moderately-prescriptive	Heavily restrictive
<b>Is there a threshold of threat for triggering application of the Principle? (a)</b>	Yes For example, 'significant', 'irreversible', 'serious' harm	Sometimes	No
<b>Is an assessment of the costs and benefits of alternative actions required?</b>	Usually Cost-effectiveness may be applied	Not usually Cost-effectiveness may be applied	No Cost-effectiveness may be applied
<b>Is precautionary action required?</b>	No	Yes Either required or 'justified'	Yes
<b>Is the burden of proof assigned? (b)</b>	No Depends on other regulations	No Depends on other regulations	Yes Developer/producer bears the burden of proof
<b>Is liability for harm assigned? (c)</b>	No	No	Usually Developer/producer bears liability

(a) Failure to satisfy the threshold test prevents the Principle being invoked but does not preclude precautionary action.

(b) The standard of proof is crucial in determining the practical effects of assigning liability.

(c) Liability is the legal obligation to provide compensation for damage resulting from an action for which the liable party is held responsible.

Source: (Weirer and Loke 2007: 7)

Costs also arise from distorted priorities. Heavily restrictive applications risk ignoring real and present dangers by placing too great an emphasis on distant and potential risks. Disproportionate responses that fail to deal with known and real risks now may impose significant costs on society.

Perverse consequences may also impose costs. Such consequences arise from heavily restrictive interpretations of precaution that mandate action, regardless of cost, in the event that the preventative or remedial actions taken are ineffective. Application of safety margins and improved information through research, evident in flexible approaches, may be more effective and minimise costs of action.

Well-established Australian expressions of the precautionary principle explicitly seek to balance consideration of economic and environmental consequences of decision-making. Specific acknowledgement is made of the fact that economic development pays for conservation. Section 3.3 of the Agreement states that:

The parties consider that strong, growing and diversified economies (committed to the principles of ecologically sustainable development) can enhance the capacity for environmental protection. In order to achieve sustainable economic development, there is a need for a country's international competitiveness to be maintained and enhanced in an environmentally sound manner. (Australian Government 1992)

## Applying the framework to the Wild Rivers Act

Initially, six Wild River Basins were declared in Queensland, with most situated in the Gulf of Carpentaria. Subsequently, four additional Wild River Basins — Archer, Stewart, Lockhart, and Wenlock (Queensland Government 2009a, b, c, 2010) — have been declared in Cape York. A further eight Cape York river systems are scheduled to be declared.

### Wild Rivers Act is precautionary

The Wild Rivers Act is clearly precautionary. Section three invokes precaution as a primary concept within the Act itself: '...having a *precautionary approach* to minimise adverse effects on known natural values and reduce the possibility of adversely affecting poorly understood ecological functions. (s3, 3, (b)) (emphasis added)

Additionally, precaution is raised in the Stewart River Consultation Report in response to questions from the public about the High Preservation Areas being declared to the maximum possible extent:

The department, in reviewing the proposed high preservation areas has considered the state of the natural values of the proposed wild rivers and adopted a *precautionary approach* in determining the width of the high preservation areas. (Queensland Government 2009d) (emphasis added)

### Disassociation from ESD

The Wild Rivers Act specifically disassociates itself from ESD with the Explanatory Notes to the Act stating:

The Acts that regulate these resources and activities generally do not set development limits at the catchment scale. Those Acts that do set limits, generally do so under the principles of ecological sustainable development (ESD), which permits a loss in natural values to achieve economic and social benefits. *The level of preservation sought for wild*

*rivers, which have all or almost all of their natural values intact, is higher than for ESD but below that generally provided in a national park. (Wild Rivers Bill 2005: Explanatory Notes) (emphasis added)*

The Notes go on to establish the absolute importance of preservation:

Hence it is necessary to clearly specify limits on resource allocations and activities *for the purpose of preserving the natural values of wild river systems. (Wild Rivers Bill 2005: Explanatory Notes) (emphasis added)*

The term 'preserve' has a different meaning to the term 'conserve'. Preservation does not permit any changes, while conservation allows the ongoing management and does contemplate change. This effectively unbundles the three equally important core principles of the National Strategy for Ecologically Sustainable Development of economic development, intergenerational equity and biological diversity. This is in violation of the Queensland Government's COAG commitments. The Act is precautionary in its approach and it specifically disassociates itself from the well-founded principles of ESD in a number of ways.

## Low threshold test

The Explanatory Notes recognise that pressure to develop Cape York is 'limited' and 'little' development has historically taken place:

the level of future development is not expected to be high. Wild rivers tend to be in regions of the State where little development has occurred and *generally have limited development pressure. (Wild Rivers Bill 2005: Explanatory Notes) (emphasis added)*

This establishes a very low threshold for action. Not only are there few expected threats of damage, but that these threats are currently being constrained by existing legislation and regulation.

## Precludes cost benefit analysis

The Explanatory Notes to the Act explicitly preclude consideration of cost-benefit analysis by stating:

While wild rivers may contain or support other values, such as economic, social, scientific, educational and Indigenous, the *Bill is intended to preserve the natural values* listed above. (Wild Rivers Bill 2005: Explanatory Notes) (emphasis added)

Here, the Act establishes the primacy of preservation, rendering the other values secondary and outside the scope of the legislation. In expanding on the

purpose of the Act, the Explanatory Notes introduce the concept of ‘necessary development’ without defining it. In the absence of cost-benefit analysis, necessary development is clearly understood on purely conservation grounds:

The aim of the Bill is to ensure that a declared wild river’s environment is maintained in its largely natural state, and impacts from *necessary development* minimised. (Wild Rivers Bill 2005: Explanatory Notes) (emphasis added)

Like any policy, the Wild Rivers Act imposes, either implicitly or explicitly, costs and benefits (Rolfe 1995). There has been no assessment of these to check that adverse costs are not too high. The justification of the Wild Rivers Act would normally involve an assumption that the benefits of conservation outweigh the costs. No assessment of the costs and benefits of individual declarations has been undertaken to identify whether it is worthwhile for a river to be declared. This underscores the earlier observation that the Act unbundles the ESD package of equally important core objectives detailed in the National Strategy and the Cape York Heads of Agreement. The Wild Rivers Act removes any consideration of elements outside natural preservation, including cost-benefit analysis. It is heavily restrictive legislation.

## Reverses burden of proof

A burden of proof, to be carried by the applicant, is clearly established by the Act at two stages.

- At the property development plan stage
- At the ministerial decision-making stage.

The Wild Rivers Code is very explicit in its application of precaution:

When determining whether an application meets the required outcome, the assessment manager must take a precautionary approach that is, not use the lack of full scientific certainty as a reason for not imposing requirements or conditions to minimise potential adverse effects on the natural values. *The onus lies with the applicant to demonstrate that a proposed development or activity meets the required outcomes of the code.* (Queensland Government 2007) (emphasis added)

## Is highly restrictive

A proponent of a prohibited development in a Highly Protected Area (HPA) can seek to have the prohibited development assessed by lodging a Property

Development Plan. Approval of the Plan does not result in approval to proceed. Rather, the approved Plan forms the basis for a change to the Wild River Declaration.

Consideration of a property development plan under the Wild Rivers Code is, therefore, clearly forbidden. Further, a proposal under a Plan must be assessed with reference to:

the nature and extent of any other thing proposed to be done in addition to the activities, or the taking, that would result in a *beneficial impact on the natural values* of the relevant wild river (s31D, 1, (j)) (emphasis added)

Not only must the proponent demonstrate that *no harm* will arise from the proposed development, the proponent must demonstrate a *beneficial impact* on conservation values! This narrowly defined beneficial environmental impact is well outside the scope of ESD. Well-defined and accepted Australian interpretations of ESD place no requirement of proof on proponents. The Act is clearly highly restrictive, a finding reinforced with reference to Ministerial decision-making. Any proposed amendment is also subject to the consideration of public submissions and, ultimately, ministerial decision. Once a property development plan is considered by the relevant minister, the minister is required to ensure that the proposed amendment: 'will not have an overall adverse *impact on the natural values* of the wild river. (s31E(b)) (emphasis added)

And that further: 'the *environmental benefits* of the plan justify the approval of the plan. (s31E(c)) (emphasis added)

The proposed amendment must demonstrate that the property development plan has positive environmental benefits and not simply an absence of harm.

The process for ministerial decision is lengthy and expensive. For example, a proposed plan has to be submitted with a fee and assessed by an independent panel of scientists expert in hydrology, geomorphology, water quality, riparian function and wildlife movement. If the minister approves the plan, with or without conditions, the minister can then seek to amend the declaration through the current formal process, including public consultation and submission. Based on submissions, the minister will then make a decision whether to amend the declaration. If the declaration is amended the landholder will then have to submit applications for each development and go through the normal assessment process under the Integrated Planning Act or other relevant act. This means that the developments will have to meet the wild rivers requirements. Also, to prevent the landholder later choosing to capitalise on the amended declaration and applying to do something else all developments on the property for the

next 10 years have to be in accordance with the plan (*Weekly Hansard* 2007). With respect to decision-making, the Wild Rivers Act is a highly restrictive interpretation of the precautionary approach.

## Is costly

The Act's heavily prescriptive approach precludes assignment of direct costs arising from damage to developers – the 'polluter pays' concept. Liability is irrelevant, as many developments in HPA zones are simply prohibited. Allowable developments in HPA and Protected Area (PA) zones are assigned liability for damage under existing legislation (for example, the Environmental Protection Act (1994)). A broader range of cost considerations must also be taken into account when testing the severity of precaution in the Act (Cooney 2004).

Wild Rivers specifically excludes consideration of costs beyond a narrow interest in loss of natural preservation values. While the Act specifically acknowledges the presence of other competing interests, it clearly disregards them. In doing so, costs associated with lost economic development opportunities and social exclusion are precluded from consideration in the operation of the Act. Decisions are made purely on the basis of environmental benefit. This places significant potential opportunity costs on society.

## Neglects intergenerational equity

In as much as Wild Rivers implicitly acknowledges intergenerational equity by seeking to preserve amenity for future generations, it achieves this only in part. While it seeks to conserve Cape York's river catchments for future generations, it ignores the economic and social well-being of these same future generations. Heavily restrictive conservation policy that is disassociated from ESD eliminates current development opportunities and also eliminates all future opportunities. ESD gives full voice to future generations by limiting current and future development that does not maximise welfare. The singular focus on future enjoyment of the environment, at the expense of future economic and social welfare, makes the Act heavily restrictive.

## Treats landowners inconsistently under the Act

A further matter, not readily fitting within the Weirer and Loke framework but worthy of consideration nevertheless, is that the Act treats the current and future options of landowners inconsistently. For example, the Act purports to make provision for current and future mining, fishing and grazing. In the Second Reading Speech to parliament on 24 May 2005 the minister gave clear

guidance that the Act provided 'enhanced opportunities' for grazing and fishing. Speaking to subsequent amendments to the Act during the Second Reading on 31 October 2006, the minister permitted minerals exploration and below-ground mining.

What the Act does is prohibit and regulate a wide range of lower-level activities such as tourism and market gardens, for example. The Act seems disproportionate in its response to the actual threats posed to Cape York as opposed to distant and uncertain threats. This necessarily imposes costs. The established Australian legislative and regulatory practice of ESD specifically seeks to minimise costs by allowing wide consideration of costs and benefits attributable to conservation, development and intergenerational equity and selecting options that maximise total benefits, net of costs.

Section 17 of the Act specifically recognises and protects property owners who have elected to develop their land already: 'This clause preserves existing rights of entities to carry out activities and take natural resources.' (Wild Rivers Bill 2005: Explanatory Notes)

Activity that was being carried out prior to declaration and activity that was authorised prior to any declaration under the Act is allowed to continue despite the subsequent operation of the Act. The Queensland Government denies claims that any rights are injured (Queensland Government 2009d) but, compensation issues aside, the very recognition of pre-existing rights implies that future rights may be degraded. This point is underscored by the fact that Property Development Plans across a range of activities in HPAs will not be accepted and are deemed to be improperly made.

Applying the options framework to these circumstances suggests that options already exercised are recognised and protected but future options as yet unexercised are not recognised and not protected.

## The rights to future options are injured

In the instance of significant injury to property owners' range of future options, governments frequently compulsorily acquire the property. The Australian Government is constitutionally compelled to compensate property owners 'on just terms' when compulsorily acquiring property. While State governments are not compelled to apply just-terms compensation, they frequently do so (Nicholls 2008).

When future options are only modestly injured, compensation is a cost effective alternative to compulsory acquisition. This recognises that future options are potentially impaired in the instance of government decision making. (Ibid)

The Wild Rivers Act offers neither compensation nor compulsory acquisition, an aspect of the legislation that the Scrutiny of Legislation Committee commented on as follows:

It appears to the committee that the only circumstance in which existing rights might potentially be adversely affected by a wild river declaration would be if a declaration affected freehold land. In such cases the general common law right of landowners of freehold land to use that land (subject to not causing 'nuisances' to adjoining landowners) in whatever manner they see fit would probably be inhibited. (Scrutiny of Legislation Committee 2005)

The Act employs a device under the Integrated Planning Act that mandates that certain development applications cannot be considered by the department or the minister.

Injury to the rights of property owners is particularly relevant under Wild Rivers. Declaration of Wild Rivers and the high-preservation zone is made regardless of the property type. Future options available to affected owners are potentially severely curtailed, yet the State makes no offer of restitution for these lost options. This is particularly significant as options are being restricted while tenure resolution is under way through State Land Dealings.

Property owners are potentially faced with injurious impacts to their possible future options. The minister underscored this point in the Act's initial Second Reading speech stating: 'Very few activities will be permitted in the waterway itself or in the 'high preservation' area, including a buffer up to one kilometre wide on each side of the river.' (*Weekly Hansard* 2005)

The Act 'does not limit the matters the Minister may consider' (Wild Rivers Act 2005). It does, however, direct the minister to consider:

- the results of community consultation on the declaration proposal
- all properly made submissions about the declaration proposal
- any water-resource plan or resource-operations plan that applies to all or part of the proposed wild river area.

The Wild Rivers Act fails to recognise that Property owners have 'standing' and are not simply unrelated third parties to the legislation and its direct impacts. Third-party voices are given equal treatment and the Act has no basis

to establish or differentiate the voices. In a best-practice guide published by the World Conservation Union, Cooney (2004) observes that issues of inappropriate incidence of cost burden are 'intimately tied to the question of who is involved and represented in the decision-making process'. Simply appearing as one of many individuals and organisations that participated in a consultation forum does not equate to involvement and representation in decision-making. Cooney then cautions against abuse of the precautionary principle that renders it merely as a 'rhetorical tool of convenience'.

## Conclusion

Many of the arguments made by the Queensland Government for the preservation of Cape York could apply to any river in Queensland. A key reason for the focus on Cape York is that the costs of preservation are seen to be low. If this were not so, the legislation would apply everywhere in Queensland. The real problem with the Act is that some general assessment of costs and benefits is being used to select the rivers for declaration, but this is not explicit, and there is no use of costs and benefits to temper the application of the policy on a case-by-case basis. The Wild Rivers Act applies a highly restrictive interpretation of the precautionary principle that unnecessarily limits property owners' future options. Future ESD options on Cape York are currently subject to significant and excessive restrictions. These include:

- legislation such as the Vegetation Management Act 1999
- the current nature of land tenure which is not conducive to the economic use of land.

There is an ever-expanding set of possible future limitations to ESD options in Cape York. The Wild Rivers Act sets a dangerous precedent by radically departing from the well-established and widely understood Australian commitment to the principles of ESD and their equally important foundational concepts. Other possible future limitations to ESD options include:

- World Heritage listing (currently proposed by the State and Commonwealth Governments)
- Australian Heritage listing (proposed by Humane Society International)
- Climate change.

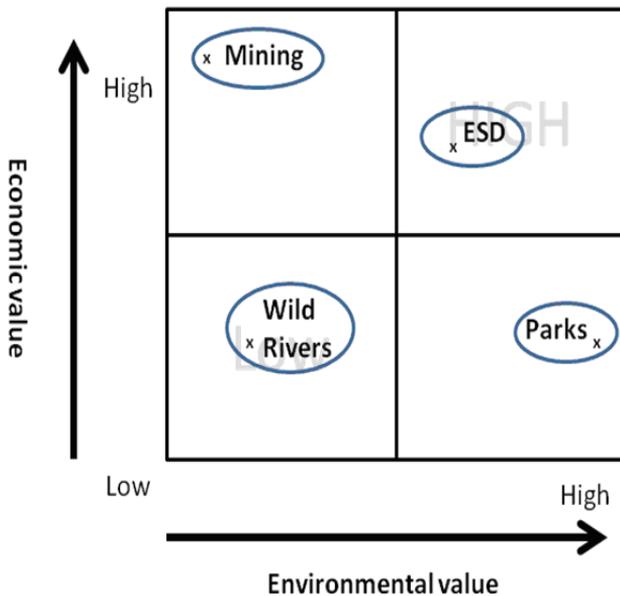
ESD actively seeks to maximise the range of potential future options available to land owners. It explicitly maximises both economic and environmental options. It looks at Wild Rivers and ESD in relation to the maximisation of environmental and economic value. The upper-right quadrant defines high economic value

and high environmental value. The lower-left quadrant identifies low economic and low environmental value. High economic and low environmental value is described by the upper-left quadrant, while low economic and high environmental value is defined in the lower-right corner.

National Parks maximise environmental options but explicitly limit economic options. The Act maximises neither. From an options perspective, National Parks may restrict future potential land-use options to a similar extent as mining. Mining has some irreversible destructive impacts on the environment. National Parks and the conceptual extension of natural-value preservation on private land through Wild Rivers are in practice irreversible. Some governments are now reliant on green electoral preferences. Ascent to power would be blocked to political parties advocating the abolition of a National Park. The onerous legislative process specified in the Act for Wild River Declaration amendments is also likely to ensure practical irreversibility.

The Wild Rivers Act is too narrowly focused. It assumes that the only potential risks are environmental. Welfare Reform has demonstrated the risks associated with a lack of development and social engagement. These risks have also been shown to be intergenerational.

**Figure 1: Ecologically sustainable development assessment of Wild Rivers**



Note: ESD = Ecologically sustainable development; Parks = National Parks

Source: Authors.

## References

- Arrow, K. and Fisher, A. 1974, 'Environmental Preservation, Uncertainty, and Irreversibility', *Quarterly Journal of Economics* 88(2): 312–19.
- Australian Government 1992, *Intergovernmental Agreement on the Environment*, Department of the Environment, Water, Heritage and the Arts: <http://www.environment.gov.au/esd/national/igae/index.html>
- Brundtland, G. H. 1987, *Our Common Future*, World Commission on Environment and Development.
- Cape York Heads of Agreement 1996*, The Wilderness Society: <http://www.wilderness.org.au/articles/agreement/?searchterm=cape+york+heads+of+agreement>
- Cape York Institute 2009, *The economic potential of emerging markets for carbon and biodiversity for Cape York Indigenous people*, Cairns: Cape York Institute for Policy and Leadership.
- Cooney, R. 2004, 'The Precautionary Principle in Biodiversity Conservation and Natural Resource Management: An issues paper for policy-makers, researchers and practitioners', Gland, Switzerland and Cambridge, UK: IUCN.
- Cussen, K. 2009, 'Handle with Care: Assessing the Risks of the Precautionary Principle', *Australasian Journal of Environmental Management* 16(2): 66–9.
- Ecologically Sustainable Development Steering Committee 1992, *National Strategy for Ecologically Sustainable Development*, Department of the Environment, Water, Heritage and the Arts: <http://www.environment.gov.au/esd/national/nsesd/strategy/index.html>
- Farrow, S. 2004, 'Using Risk Assessment, Benefit-Cost Analysis, and Real Options to Implement a Precautionary Principle', *Risk Analysis* 24(3): 727–35.
- Gollier, C. and Treich, N. 2003, 'Decision-Making Under Scientific Uncertainty: The Economics of the Precautionary Principle', *The Journal of Risk and Uncertainty* 27(1): 77–103.
- International Union for the Conservation of Nature 2007, 'Guidelines For Applying The Precautionary Principle To Biodiversity Conservation And Natural Resource Management', 67th meeting of the IUCN Council 14–16 May 2007.

- Nicholls, D. 2008, *Compensation for Injurious Affection Caused by Planning Instruments — Is it Withering on the Vine?* Brisbane: Hopgood Ganim Lawyers.
- Queensland Government 2009a, *Archer Basin Wild River Declaration*, Brisbane: Department of Environment and Resource Management.
- Queensland Government 2009b, *Lockhart Basin Wild River Declaration*, Brisbane: Department of Environment and Resource Management.
- Queensland Government 2009c, *Stewart Basin Wild River Declaration*, Brisbane: Department of Environment and Resource Management.
- Queensland Government 2009d, *Stewart Basin Wild River Declaration Consultation Report*, Brisbane: Department of Environment and Resource Management.
- Queensland Government 2010, *Wenlock Basin Wild River Declaration*, Brisbane: Department of Natural Resources and Water.
- Queensland Government 2007, *Wild Rivers Code*, Brisbane: Department of Natural Resources and Water.
- Rodrigues-Neto, J. A. 2008, 'Climate Change Policy: A Theorist's Plea to Take Heed of Game Theory and Ambiguity Aversion', *Agenda* 15(2): 85–90.
- Rolfe, J. 1995, 'Ulysses Revisited: A Closer look at the Safe minimum Standard Rule', *Australian Journal of Agricultural Economics* 39(1): 55–70.
- Scrutiny of Legislation Committee 2005, *Alert Digest* (7 June) Brisbane: Queensland Parliament.
- Soule, E. 2000, 'Assessing the Precautionary Principle', *Public Affairs Quarterly* 14(4): 309–28.
- United Nations Conference on Environment and Development 1992, *Rio Declaration on Environment and Development*, UN Documents: Gathering a Body of Global Agreements: <http://www.un-documents.net/rio-dec.htm>
- Weekly Hansard 2005, May 24 Queensland Parliament: <http://www.parliament.qld.gov.au/hansard/>
- Weekly Hansard* 2006, October 31 Queensland Parliament: <http://www.parliament.qld.gov.au/hansard/>
- Weekly Hansard* 2007, February 22 Queensland Parliament: <http://www.parliament.qld.gov.au/hansard/>

Weirer, A. and Loke, P. 2007, 'Precaution and the Precautionary Principle',  
Productivity Commission Staff Working Paper.

*Wild Rivers Act 2005.*

*Wild Rivers Bill 2005: Explanatory Notes.*

*Wild Rivers Regulation 2007.*

# *REVIEWS*

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# Donald Moggridge (ed.), *Keynes on the Wireless*

(Palgrave Macmillan, 2010)

REVIEWED BY SELWYN CORNISH<sup>1</sup>

John Maynard Keynes rarely hesitated to communicate his ideas to the public. His books, articles, letters, memoranda, speeches, political tracts, and addresses to shareholders — reproduced in the 30 volumes of *The Collected Writings of John Maynard Keynes* — testify to his literary fecundity. Yet he did not confine himself simply to the printed word; he quickly recognised the power of the electronic media, which in his day meant ‘the wireless’ (or radio). From January 1925 to July 1945 he made 21 broadcasts, all but one of them for the British Broadcasting Corporation.

*Keynes on the Wireless* contains all of Keynes’s broadcasts. The date when each of the broadcasts was made is indicated, and footnotes provide the date and place of the first British publication of the broadcast and its location in *The Collected Writings*. The editor, Donald Moggridge, provides both a general introduction to the collection and shorter introductions to most of the individual broadcasts.

Moggridge states that Keynes experienced some difficulties with the broadcasts. The first broadcast, entitled ‘Inter-allied Debts’, went to air on 9 January 1925 during politically delicate Anglo-French negotiations over French war debts to Britain. Keynes was warned that his views would not be welcomed in high places, and his text was censored at the last moment by the Foreign Office on the grounds that it was pro-French. A later talk — ‘The Pros and Cons of Tariffs’ — also ran into difficulties with the BBC; Keynes was asked to remove certain references considered to be politically sensitive. There were problems, too, about the relation between the spoken and written word: Keynes expected to publish his talks but did not want to spend precious time rewriting them. The BBC, however, expected the talks to sound right and was not interested in their written form.

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Since all the broadcasts are included in *The Collected Writings of John Maynard Keynes*, there is reason to ask why they have been reproduced again. Moggridge provides no justification for their re-publication. A CD of Keynes's spoken words would have been more apposite, and welcome, but the editor does not raise this possibility. I suspect any original sound recordings have been destroyed, but we are not told.

What Moggridge could have said, but does not, is that in these broadcasts Keynes expresses simply, but with great clarity and cogency, some of his most profound and enduring ideas and policy proposals. For this reason alone, the broadcasts were worth publishing as a collection.

Let me make my case for this assertion by reference to four of the broadcasts.

In 'State Planning' (14 March 1932), Keynes dismissed the kind of planning followed in contemporary Russia and Italy, and advocated instead macro-economic planning. What he had in mind was 'the problem of the *general* organisation of resources as distinct from the *particular* problems of production and distribution which are the province of the individual business technician and engineer.' (79) 'The problem of planning', he said, 'is to do those things which, from the nature of the case, is impossible for the individual to attempt. To bring in the collective intelligence, to find a place in the economic scheme of things for central determination is not to disparage the achievements of the individual mind or the initiative of the private person.' (80) By contrast, it was 'the essence of state planning', he said, 'to do those things which in the nature of the case lie outside the scope of the individual. It differs from Socialism and from Communism in that it does not seek to aggrandise the province of the state for its own sake. It does not aim at superceding the individual...or of transforming the wage system, or of abolishing the profit motive.'(81) The 'most outstanding opportunity for state planning throughout the world', he argued, 'is to be found in the avoidance, or in the mitigation of industrial slumps during which there is so vast a loss of the world's potentialities for the creation of wealth.' (83) It was here, Keynes asserted, that the individual was helpless, 'however ardent his desire and however pressing his personal interest. He is swept along, together with all his fellows, on a flood which he cannot control or direct. And nothing can be of the least avail which does not come from concerted action at the centre.' (83)

In 'Roosevelt's Economic Experiments' (13 January 1934), Keynes predicted that the 'economic experiments of President Roosevelt may prove, I think, to be of extraordinary importance in economic history, because, for the first time — at least I cannot recall a comparable case — theoretical advice is being taken by one of the rulers of the world as the basis of large-scale action. The possibility of such a remarkable event has arisen out of the utter and complete

discredit of every variety of orthodox advice.’ (125–6). Keynes’s point was that Roosevelt was experimenting with new ideas because of the prevailing economic circumstances, which orthodox thinking had failed to prevent and correct; it was not the arrival of new ideas that occasioned their adoption, but rather the conditions of the day. As he put it, the ‘state of mind in America which lies behind this willingness to try unorthodox experiments arises out of an economic situation desperate beyond precedent.’ (126) Roosevelt, Keynes believed, was ‘an empiricist, not wedded to any particular doctrine or any one technique, tolerant, optimistic, courageous and patient, he has been happy to provide the political skill and the power and authority to give some sort of a run to all kinds of *ideas*, ready to judge by results, but admittedly experimenting and watching carefully to drop in time schemes, the actual operation of which begin to seem dangerous or disappointing.’ (127)

Perhaps the most profound of Keynes’s broadcasts was the one he made on 19 November 1934. In the title he asked the question: ‘Is the Economic System Self-Adjusting?’ In the battle of ideas being waged at the time, he identified two main groups: ‘On the one side are those who believe the existing economic system is, in the long run, a self-adjusting system, though with creaks and groans and jerks and interrupted by time lags, outside interference and mistakes.’ (133). ‘On the other side of the gulf are those who reject the idea that the existing system is, in any significant sense, self-adjusting.’ (134) In the first group were adherents to the dominant classical economic theory, among whom Keynes included the followers of Karl Marx. The second group included those whom Keynes referred to as heretics, among them J. A. Hobson and other under-consumptionists.

Keynes declared that he was with the heretics. But he thought the heretics would never win the day until they adequately exposed the flaws in relevant areas of orthodox thinking. Keynes himself was convinced there was ‘a fatal flaw in that part of the orthodox reasoning which deals with the theory of what determines the level of effective demand and the volume of aggregate employment; the flaw being largely due to the failure of the classical doctrine to develop a satisfactory theory of the rate of interest.’ (137) This led him in the broadcast to spell out his theory of the consumption function: as income grew, so did expenditure on consumption, but by a smaller amount; savings would increase and would have to be absorbed by investment — or by devices to increase consumption — if full employment was to be maintained. Traditionally, it was thought that the rate of interest brought saving and investment into equilibrium at full employment. But Keynes contended that there was ‘no theoretical reason for believing it to be true’. (138) Hobson and other heretics had proposed that income should be redistributed to help boost spending on consumption. While Keynes agreed that this might be a remedy for unemployment, he preferred to boost investment by ‘reducing the rate of interest and in other ways’, though at

present he admitted that 'it is important to maintain a careful balance between stimulating consumption and stimulating investment.' (139) He was adamant, however, that 'None of this...will happen by itself or of its own accord. The system is not self-adjusting, and, without purposive direction, it is incapable of translating our actual poverty into our potential plenty.' (140)

In a broadcast entitled 'Will Re-armament Cure Unemployment?', delivered on 23 May 1939, Keynes predicted that the policy conclusions arising from his *General Theory of Employment, Interest and Money* would soon be endorsed as a result of the increase in expenditure associated with the coming war. 'Those in authority', he said, 'have refused to believe that it [unemployment] could be cured by large-scale state expenditure on housing and other needed improvements. If this were correct, it would follow that neither can it be cured by large-scale state expenditure on armaments, of all forms of expenditure the most unproductive. But, for reasons beyond our control, the grand experiment is to be made. In rearming this country, shall we, by accident so to speak, cure unemployment? This is a most exciting question for the workers — and also, I may add, for the economists.' (187–8) Reviewing in some detail current and planned expenditure announced by the government, and assuming moderate multipliers, Keynes concluded that abnormal unemployment would soon disappear. As he put it: 'The grand experiment has begun. If it works, if expenditure on armaments really does cure unemployment, I predict that we shall never go back all the way to the old state of affairs. If we can cure unemployment for the wasted purposes of armaments, we can cure it for the productive purposes of peace. Good may come out of evil. We may learn a trick or two which will come in useful when the day of peace comes, as in the fullness of time it must.' (193) The rest, as they say, is history.

# Roger Alford, *Life and LSE*

(Book Guild Publishing, 2009)

REVIEWED BY SELWYN CORNISH<sup>1</sup>

What are the essential elements and priorities of academic life? Should research be pre-eminent? Or should teaching have priority? What responsibility should academics take for the governance of their institutions? Should there be an obligation to undertake public service outside the academy? In *Life and LSE*, the author does not attempt explicitly to answer these questions. But in telling the story of his career at the London School of Economics (LSE), Roger Alford makes his position clear.

Alford has engaged fully in all aspects of academic life: he wrote an important book, and published papers in leading journals; he promoted improvements in the quality of teaching and learning; was active on administrative committees; and spent two years at the Bank of England, gaining practical experience in his chosen fields of monetary economics and financial institutions. While this breadth of activities was not uncommon at British (and Australian) universities in the early post-Second World War decades, it became increasingly less common with the increased emphasis on research output; with teaching responsibilities allocated to graduate students and non-tenured staff; with the replacement of academic staff by professional administrators in the management of universities; and with the demands of research reducing the opportunities to engage in public service.

This biography will be of particular interest to those who may be curious to learn about the work of economists at an elite academic institution in the second half of the twentieth century. As well as illuminating the career of an individual, the book also provides a history of the LSE. Its physical infrastructure and administrative structures are explained, and there is much discussion about staff and students. In addition, the book tells the story of the author's personal life, about his social and cultural roots, his upbringing and schooling, the experience he gained working for a firm of stockbrokers in the City of London, his army service in Germany at the end of the war, his marriage and children, and the

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Alford family finances (an entire chapter is devoted to this topic). In writing this account, Alford has relied heavily upon his memory, but he draws as well on his diaries, from which large extracts are reproduced throughout the book.

Roger Alford was born in London in 1926. His father was an artist who became an architect and developer; his mother had worked as an artist in the fashion industry. His grandfather and a great grandfather on his mother's side were headmasters. Roger attended St Paul's school, but when his family's financial circumstances deteriorated he had to leave before completing his final examinations. He secured a job as a stockbroker, working on the floor of the stock exchange and in the short-term money market. Eventually, he was called-up for military service, joining the occupation forces in Germany. He returned briefly to the City and stockbroking. But following advice he decided to gain admission to the LSE as a mature-aged student, completing the entrance requirements by studying at night. He began his undergraduate studies in 1949. Having gained first-class honours in economics in 1952, he was immediately offered a temporary lectureship at the LSE and proceeded to work his way up the academic ladder. At the time of his formal retirement in 1992 he held a named readership — the Cassel Readership in Economics. He was still a member of the senior common room in 2009, the year that marked the sixtieth anniversary of his connection with the LSE.

When he joined the staff, the LSE was still a small institution. Its 1500 undergraduates, 300 graduate students and 180 academic staff were crowded into a building in Houghton Street, which contained the library, offices and classrooms. Staff from different departments knew each other and could engage in conversations about their work in the different social sciences of which the LSE specialised. Lionel Robbins held court in the same area of the senior common room at morning and afternoon tea as he had done ever since his arrival at the LSE in the late 1920s. Alford joined the small monetary economics group led by Richard Sayers. He taught macroeconomics to third-year undergraduates and a course in monetary economics and financial institutions to graduate students. He took his teaching seriously, making himself readily available to students; he prepared a document on good study habits, which was distributed to students throughout the LSE (a copy is reproduced as an appendix to the book). He was put in charge of teaching rosters in the economics department and emphasised the importance of sharing teaching loads equitably.

In late November 1959 he was offered the opportunity to work at the Bank of England for two years, becoming the first outside economist appointed to the Bank. Alford's main task was to assist in the preparation of the Bank's new *Quarterly Bulletin*, which had been recommended by the Radcliffe Committee as a means of enhancing the Bank's communications with the general public. He played a major role in the production of the first issue and to a lesser extent

in subsequent issues. He undertook other projects, including an examination of possible consequences for the monetary system of inflows and outflows of foreign currency. This led to an interest in the conceptual aspects of the flow-of-funds framework, which became the subject of his later book.<sup>2</sup>

Alford formed a somewhat jaundiced view of the Bank and its work. The Bank's senior executives appeared not to be interested in ideas, and failed to provide adequate leadership. One Bank official informed him that 'monetary policy is psychological warfare'. (273) He was told that the Bank of England was a 'weak central bank...because the Bank had no faith in its ability to manage the system with precision.' (272) Alford himself 'got the strong flavour of the Bank's unwillingness to extend its area of responsibility if it could possibly avoid it'. (274) When the subject of devaluation came up in a conversation with a senior Bank official, the latter was 'very uncommunicative', though 'clearly thought has been going on at the top'. (283) The 'message to me', Alford recounted, 'was that it was more expedient for us in conversation etc. to stress things like export incentives. He [the Bank official] also reminded me of my own views that if we really get down to doing things which would be necessary for effective improvement in the balance of payments by devaluation (efficiency generally, keep down wage costs, keep up slack in the economy — and high elasticity of supply of exports) then devaluation might not prove necessary. In other words, as far as possible avoid touching the subject directly.' (283–4) When Alford raised the leadership issue with a Director of the Bank, he was told that 'the Bank was an operating institution and most of its actions were really reactions to situations facing it. I suggested there must be ground rules — general principles etc. Stevens [the Director] said that these were so simple as to be platitudinous and any more active policy was likely to run into a political quagmire.' (276)

When a new Governor, Lord Cromer, was appointed soon after Alford's arrival at the Bank, Alford described him as a person 'about whom no one I have talked to knows anything'. (271). Later, after Alford was part of the Governor's entourage during a visit to Birmingham, he wrote in his diary that the Governor 'revealed one strong principle — honest money, but here also no evidence of underlying thought on relative costs and returns etc. of such a policy. He speaks very sloppily, is a bit effete and a shade supercilious, but occasional touches of quite nice humour. No signs of [other] deeply seated principles. Not well equipped intellectually, but no fool (his writings perhaps show more strength). Difficult to see any real leadership on any central banking issue, but probably no obstruction to general progress. He takes his position pretty easily and seems a typical scion of a merchant banking peerage family; he can be quite tough when his own decisions or views are opposed. I feel the Bank could/should have done better.' (287)

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2 *Flow of Funds. A Conceptual Framework and Some Applications*(Gower/LSE 1986)

Alford returned to the LSE and soon observed that, while Sayers's banking seminars and Robbins's economic theory seminars were flourishing, there was no seminar devoted to money and macroeconomics. He quickly resolved to repair the omission. The result was the Money and Macroeconomics Workshop, which he established in 1963. It soon attracted academics from beyond the LSE, graduate students (one was Stan Fischer, now the Governor of Israel's central bank) and visitors from the Bank of England, the Treasury and the City; Harry Johnson, who had joined the LSE in 1966, regularly attended the Workshop. In its early years considerable attention was directed to Milton Friedman's views on monetary theory and policy; there 'were keen arguments between pro- and anti-monetarists'. Alford himself was never a monetarist, and he writes that 'I cannot recall Harry [Johnson] ever committing himself one way or the other on its [monetarism's] practicability for policy.' (339)

Of the student troubles that seriously disrupted the LSE in the mid-and-late 1960s, Alford took an uncompromising stand. While he was never part of an official team established by the authorities to negotiate with the students, he was very active on the ground, 'doing all I could to oppose the ideas and actions of the trouble-making student leaders and their naïve followers'. (326) He attended public meetings called by the student leaders and contested their views, 'emphasising the irresponsibility of their actions, making clear my strong disapproval of their behaviour and standing up for what I know to be the true values of the School'. (326) Here, Alford exhibited his strength of character. Even though much of his career at the LSE was student focused, when it came to preserving the institution's reputation there could be no capitulation to those whom he thought were intent upon destroying the exchange of liberal ideas.

Alford's is a life worth telling. A reader will learn what it was like to be a member of the economics department at the LSE in the second half of the twentieth century. Many insights are provided into how the LSE was run. There are also his acute reflections on the Bank of England. Above all, it is the story of a decent and honest human being; of a person who lived a satisfying life, enjoyed what he did, who was liked and respected by his colleagues and students, and was comfortable with his family life.