Editorial Note

Agenda's New Look

In its 13-year history Agenda's look, and its presentation format and style, have not changed significantly. Starting with this issue, Agenda has adopted a modern new look. The new colours and style flow from the policy of The Australian National University's College of Business and Economics, the publishers of Agenda, to present a consistent corporate image in all the College's publication. Adoption of the new look is strictly an aesthetic change and does not affect Agenda's aims and objectives, nor the articles that are published. The contents of each issue will continue to be presented in the traditional structure that has become familiar to subscribers and regular readers.
Superannuation Tax Reform: Fiscal Consequences

Sinclair Davidson and Ross Guest

In his 2006 Budget speech, Treasurer Peter Costello announced 'the most significant change to Australia's superannuation system in decades'. The reform objectives were to 'sweep away the current complexity faced by retirees, increase retirement incomes, give greater flexibility as to how and when superannuation can be drawn down, and improve incentives for older Australians to stay in the workforce' (Costello, 2006). These four objectives were motivated by the broader economic challenges of population ageing, insufficient savings by the baby boomer generation, and a shortage of skilled workers. We focus on the announcement that, from 1 July 2007, income from a taxed superannuation fund would not be taxable for individuals aged over 60. What was not announced in the budget, nor subsequently announced, is the expected budget cost of these reforms, and it is this particular aspect of the reforms that we investigate here.

Superannuation assets have been projected to more than double in real terms between 2005 and 2020 (IFSA, 2007), compared with an increase in real GDP in the order of 60 per cent (at 3 per cent compound growth) over the same period. Hence the ratio of superannuation assets to GDP could nearly double in this period. There are several reasons for this growth. IFSA (2007) reports a study suggesting that 23 per cent of this growth can be attributed to the changes introduced in the 2006 Budget. Other factors include: the cumulative effect of the 9 per cent compulsory contribution rate that has applied since July 2002; the growing awareness of the benefits of superannuation and its increasing flexibility; and an older workforce.

Given this context, simply extrapolating the current revenue from the superannuation exit (or benefits) tax would not be appropriate as it would not allow for increased contributions leading to increased superannuation assets. We first consider the budgetary costs if voluntary contribution rates were to increase after 2007. Under our assumptions (explained below) budgetary costs would be around one per cent of GDP (around $10 billion). We then consider the budgetary costs of the concessional treatment of superannuation benefits and contributions. These costs are potentially much larger, amounting to several per cent of GDP.

The Productivity Commission (2005) indicated that government revenue as a share of GDP was not sensitive to an aging population and was projected to remain stable over the next 40 years, but also indicated that spending would increase by about six per cent of GDP given current policy and private sector behaviour. Following the superannuation reforms we show that this figure could blow out by an additional one per cent of GDP. Our results also suggest that the
fiscal costs of ageing could be reduced substantially by (partially) eliminating the tax concessions on superannuation benefits.

An important qualification concerns our assumption about superannuation coverage by age group. The number of individuals with superannuation in each age group is assumed to increase with their population growth rates. Hence the rate of coverage of workers by age group remains constant. This underestimates the extent of superannuation coverage in future decades because the superannuation coverage of older workers, especially, will be higher than it is today. This has two opposite fiscal implications. It implies an underestimate of the fiscal cost of the tax concessions on superannuation; but it ignores the budgetary savings from reduced pension eligibility due to higher rates of superannuation coverage. We ignore these opposing fiscal effects, as does the Institute of Actuaries of Australia (IAA, 2006) in their analysis. We (and the IAA) also ignore other general equilibrium effects of lower superannuation taxation that could affect government tax revenue — in particular we ignore any response of labour supply or personal saving and therefore any effect on rates of capital accumulation and economic growth. We acknowledge that these effects may not be trivial but leave them for future work.

**Background: Taxes on Superannuation**

Australia's superannuation system rests on 'three pillars': a means-tested age pension financed on a ‘Pay-As-You-Go' basis, and two private superannuation components — the first financed by a compulsory employer contribution of nine per cent of salary, and the second by voluntary contributions. Most industrial economies follow a similar policy framework. Where Australia has differed from other economies is in the taxation aspects of superannuation.

Currently in Australia income flows relating to superannuation are taxable at three stages: on pre-tax income contributed to the fund, on income generated from assets held in the fund, and on income withdrawn from the fund — an 'exit' tax. The exit tax in Australia is designed specifically to provide a disincentive to lump sum withdrawals. In particular, the government wished to avoid asset dissipation or 'double-dipping', which can occur when retirees spend all their lump sum benefits on consumption in order to qualify for the age-pension. This system of taxing income flows at all three stages is sometimes described as a TTT system (the three T's denoting the three stages at which income is taxed); see Whitehouse (1999). Other combinations used in OECD countries are: TTE, where tax is levied on the way into the fund and while in the fund, but at a zero per cent on the way out; ETT, where income on the way into the fund is tax-exempt, but taxable while earned from assets in the fund and taxable on the way out; EET, where income on the way into the fund and on earnings while in the fund are both tax-exempt, but income on the way out is taxable. As of 2002 Australia was the only OECD country to adopt the TTT system (Horne, 2002). Among OECD economies, the EET model is the most common, where contributions and earnings are tax-free but benefits are taxable. Following the Budget announcement, Australia will have a TTE model. In the appendix we show some simple algebra demonstrating the equivalence of the TTE model and the ETT models under certain assumptions.
The Senate Select Committee on Superannuation in 2002 investigated three questions: Is the structure of taxation at present appropriate? How can retirement incomes be increased? How does the superannuation system impact on the work-retirement decision? The Committee's recommendations included the phasing out of contributions and end-benefits taxes, exploration of methods to encourage older workers to remain in the workforce, and simplification of the superannuation system. The government's response was minimalist, and most of the recommendations, including the phasing out of the contributions tax, were rejected. Many commentators, however, continued to call for the abolition of the contributions tax. In early 2006, Senator Nick Minchin proposed the abolition of contributions tax to promote greater savings into superannuation (Marris, 2006). Media speculation indicated that this proposal would 'cost' the government about $3.3 billion per annum, but only deliver an additional $30 per week to retired workers (Anderson and Allen, 2006). This additional income would occur in the future, but have little impact on those individuals likely to retire in the near future.

Much of the complexity surrounding superannuation taxation relates to the exit taxes. As taxes have been introduced, existing contributions to superannuation have been 'grandfathered' in place. Appendix 13 of the Senate Select Committee (2002) sets out the 'grandfathered' provisions. Without appropriate arrangements the tax consequences of retirement can be onerous. For example, Treasury (2006:2) has calculated that a lump-sum payment could consist of 'up to eight different parts taxed in seven different ways'. Many retirees therefore incur high financial planning fees in order to organise their affairs. In its response to the Senate Select Committee, the government had indicated it was 'mindful of the need to reduce complexity in superannuation' (Commonwealth Government, 2005:17). Treasury (2006) also indicated that the greatest component of complexity in superannuation was the taxation of end-benefits. In his budget speech, Peter Costello indicated that eliminating exit taxes 'would be the most direct way of cutting through the complexity of the current system'.

Apart from reducing complexity, there are other arguments in favour of eliminating the benefits tax and hence shifting from a TTT model to a TTE model. It increases the disposable income of those baby-boomers who are about to retire and therefore addresses the problem, as perceived by the 2002 Senate Select Committee, of inadequate retirement savings of this generation. It may encourage older workers to either remain in the work force or re-enter the work force by effectively raising their after-tax wage and therefore raising their price of leisure, providing that the income effect does not outweigh the substitution effect on their demand for leisure. Also, incentives encouraging voluntary increases in superannuation contributions arguably result in lower deadweight losses than an increase in compulsory superannuation contributions.

The fiscal implications of shifting from a TTT to a TTE model depend largely on two factors: the future age distribution of the population, and changes in voluntary superannuation contributions. We next consider the first of these issues: population ageing, beginning with some background about the role of superannuation in the context of population ageing.
Like most OECD countries, Australia's population is ageing due to the demographic transition associated with advanced economic development. The demographic transition comes in stages, starting with declining infant mortality and increases in adult life expectancy, followed later by declining fertility rates. The decline in fertility rates in most OECD countries was accentuated by the earlier 'baby boom' — the jump in fertility rates associated with the end of World War II. The demographic transition and the post war baby boom has created a temporary bulge in the age distribution that will take several decades to wash out (see Bloom et al., 2003; Jackson and Felmingham, 2004). In Australia, the old age dependency ratio (those aged 65+ as a proportion of the total population) is expected to roughly double between now and 2050 to between 24 per cent and 28 per cent depending on assumptions (ABS Catalogue 3222.0). This implies a falling employment to population ratio, which, in turn, implies a fall in per capita consumption (living standards) growth below labour productivity growth in the absence of behavioural changes by workers and consumers or policy changes by government (see Guest and McDonald, 2002 for a full discussion). Such changes would have to imply an increase in labour force participation rates (LFPRs) of older workers or an increase in the rate of national saving.

The introduction of compulsory superannuation, in 1992, can be seen as an attempt by the Government to offset the effect on future consumption of a declining employment to population ratio. It serves another purpose from the Government's perspective, which is to reduce the calls on the Federal Budget due to rising old-age pension liabilities. The Productivity Commission (2005) has estimated these liabilities would rise by 1.7 per cent of GDP between 2004 and 2045 in the absence of behavioural or policy changes. The increase in the rate of compulsory superannuation to the current rate of nine per cent is intended to mitigate this growth in pension spending and is consistent with the shift in other OECD countries to pre-funding of old age pensions. However, this rate is unlikely to provide adequate retirement income even in the long run. The Australian Superannuation Funds Association has calculated that a nine per cent contribution rate over 40 years would generate a pre-tax replacement income ratio of 40 per cent (Horne, 2002). This is less than the 60-65 per cent of pre-retirement gross income, or (equivalently) 70-80 per cent of pre-retirement expenditure recommended by the Senate Select Committee (Senate Select Committee, 2002:40). The Commonwealth Government's response to the Commission's report made it explicit that they do 'not support setting a replacement rate target', yet its own modelling on the current superannuation structure would yield a rate similar to the Senate recommendation (Commonwealth Government, 2005:1).

One policy option in order to increase the replacement rate would be to increase the compulsory contribution rate, but this would be of dubious merit. As argued in Guest and McDonald (2002) compulsory superannuation contributions can reduce national economic welfare in two ways. The first round welfare loss arises from the liquidity constraint on optimal consumption smoothing, at least for low-income earners, and from the distortion to choices of saving vehicles for high-income earners. Compulsory superannuation causes a second round welfare loss
by imposing a tax on employment (Freebairn, 1998). A better approach, arguably, is to provide tax incentives for voluntary superannuation contributions such as those announced in the 2006 Budget (although these imply other welfare losses in the form of deadweight losses arising from tax expenditures).

As noted above, the additional aim of the 2006 Budget changes relating to superannuation was to increase the LFPRs of older workers to offset the burden of population ageing. The new rules could make it more attractive for individuals to remain in the workforce after age 60 and to continue saving into superannuation. Benefits paid from a superannuation fund to those over the age of 60 will be tax-free, which could boost LFPRs depending on the strength of the income and substitution effects. But importantly, individuals will be able to continue working and contribute up to $50,000 per annum to a superannuation fund, at the concessional rate, until age 75. That is, someone over the age of 60 could salary sacrifice up to $50,000 into a superannuation fund and immediately draw on that money as a lump-sum paying only 15 per cent in (contributions) tax. The 2006 Budget proposal thereby creates an age-based flat income tax — those over the age of 60, earning up to $50,000, could reduce their marginal income tax rate from 30 per cent to 15 per cent. Individuals over the age of 60 earning more than $50,000 could salary sacrifice that amount into superannuation, pay the 15 per cent contributions tax, and then pay the normal rates on their income in excess of $50,000. This policy allows a substantial decrease in the average income tax rate for those over the age of 60 who remain in the workforce.

As Horne (2002:7) says, however, superannuation policy options ‘cannot be considered in isolation without reference to ... their long-run budget costs’, which is the issue to which we now turn.

**The Fiscal Impact of the Decision to Abolish the Exit Tax**

The IAA (2006) suggests that the long-run fiscal cost of the 2006 Budget proposal is likely to be low. The IAA points out that the benefits tax currently raises very little revenue. This may be due to, at least, three factors. The exit tax acts as a disincentive for retirees to take their superannuation as a lump sum. In addition, for funds placed in super prior to 1983 only five per cent of the lump sum is taxable income; and individuals who entered the superannuation system after 1992 and who are now retiring would not have accumulated sufficient funds to exceed the tax-free threshold. The IAA calculates that the benefits tax raises 0.05 per cent of GDP in tax revenue (compared with the contributions tax which raises 0.5 per cent of GDP in tax revenue). Based on ATO data and the estimated revenue figures from the IAA, we estimate that only 13 per cent of superannuants would actually be liable for the benefits tax. The IAA concludes that the cost of eliminating the benefits tax would be small. This view, however, apparently ignores the potential for increases in contribution rates, which would increase benefits and therefore increase the fiscal cost of the tax concession on benefits.

Table 1 contains our estimate of income tax revenues potentially at risk. Using data from the ATO Taxation Statistics 2003/4 and demographic data from the ABS (Cat. 3201.0 and Cat. 3222.0) we have calculated the current income tax share of individuals aged over 60 in 2003/4. Assuming the tax shares remain
constant and participation rates remain unchanged we estimate this age group's share of total income tax in future.

**Table 1: Data for Population over 60 years of Age**

<table>
<thead>
<tr>
<th>Year</th>
<th>per cent of population</th>
<th>per cent of total income tax</th>
<th>per cent of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>24.03</td>
<td>10.47</td>
<td>1.19</td>
</tr>
<tr>
<td>2010</td>
<td>26.14</td>
<td>11.39</td>
<td>1.30</td>
</tr>
<tr>
<td>2020</td>
<td>28.67</td>
<td>12.49</td>
<td>1.42</td>
</tr>
<tr>
<td>2030</td>
<td>31.23</td>
<td>13.61</td>
<td>1.55</td>
</tr>
<tr>
<td>2040</td>
<td>33.79</td>
<td>14.72</td>
<td>1.68</td>
</tr>
<tr>
<td>2050</td>
<td>35.99</td>
<td>15.68</td>
<td>1.79</td>
</tr>
</tbody>
</table>

We estimate that by mid-century the 60+ age group would pay approximately 15 per cent of total income tax revenue under current policies and behaviour. In the most extreme case where all taxpayers in this age group convert all of their income into tax-free superannuation income, the loss of tax revenue would be 15 per cent of total income tax. As the Table indicates this would amount to 1.79 per cent of GDP, or around $18 billion in today's dollars. Of course this is the limiting and perhaps hypothetical case. Nevertheless, given the ease of using the arrangements to generate income tax-free for the 60+ age group, it is reasonable to expect the final outcome to be close to the limiting case.

**Calibrating a Base Case**

Our aim here is to project the size of various superannuation taxes given population projections and assumptions about future contribution rates. First we calibrate our calculations of the size of superannuation taxes in 2004 with those reported by the IAA (2006), both as a validity check and because we want to compare our projections with theirs.

Table 2 presents the base case data at 2004. It derives from ABS data (Cat. 6360.0, Tables 1, 10, 15, 16) the following information by age group for the year 2000: the number of persons with superannuation; their annual contributions; and their median balances. We also use Australian Taxation Office data on mean income per age group (Taxation Statistics, 2003/4, Personal Tax, Table 12). We combine data from both of these sources to calculate mean superannuation contributions as a per centage of income per age group; see Table 2 Column 5.

The IAA (2006) calculates the following superannuation tax revenues as percentages of GDP for 2004: contributions tax 0.5 per cent, income tax (earned by the super funds) 0.2 per cent, and the benefits tax 0.05 per cent. Taking the contributions tax first, in order that our calculation of the contributions tax matches the IAA figure of 0.5 per cent we multiply the raw figures for superannuation contributions in Column 5 of Table 2 by a constant scaling factor for each age group. The resulting scaled super contributions are given in Column 5 of Table 2. For the benefits tax calibration, we first multiply the number of persons aged 55-64 who have superannuation (744,000) by their median superannuation balance and multiply this by the 15 per cent benefits tax rate.
This gives a raw figure for the benefits tax revenue, which would over-estimate the true figure because it would assume that all of the 55-64 year olds withdrew their superannuation and all of them paid the tax. So we calibrate by multiplying our raw figure by the fraction that gives the IAA figure of 0.05 per cent. This fraction is 13 per cent, which can be interpreted as the proportion of superannuants who in fact paid the benefits tax. For the income tax calibration, we need to estimate the income earned on assets held by the superannuation funds. For this we assume that income is earned at a (real) rate of 6 per cent of assets and that this income attracts the income tax rate of 15 per cent. The assets are calculated by multiplying the median superannuation balances by the number of persons with superannuation. These calculations give our raw figure for income tax revenue that we then calibrate to the IAA figure of 0.2 per cent by an adjustment factor (which turns out to be 1.71), which can be interpreted as the upward adjustment of the median super balances for each age group to the mean super balances.

Table 2: Age and Superannuation in 2003/4.

<table>
<thead>
<tr>
<th>Age</th>
<th>persons with super</th>
<th>Super contributions</th>
<th>Mean super contribution</th>
<th>Mean income</th>
<th>Mean super contribution</th>
<th>Median super balance</th>
<th>per cent of income</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24</td>
<td>1,330</td>
<td>277,212</td>
<td>208</td>
<td>19,103</td>
<td>1.09</td>
<td>3.44</td>
<td>1.02</td>
</tr>
<tr>
<td>25-34</td>
<td>2,279</td>
<td>1,857,388</td>
<td>815</td>
<td>36,257</td>
<td>2.25</td>
<td>7.09</td>
<td>7.02</td>
</tr>
<tr>
<td>35-44</td>
<td>2,262</td>
<td>2,712,840</td>
<td>1,199</td>
<td>43,553</td>
<td>2.75</td>
<td>8.69</td>
<td>12.76</td>
</tr>
<tr>
<td>45-54</td>
<td>1,886</td>
<td>2,823,548</td>
<td>1,497</td>
<td>46,124</td>
<td>3.25</td>
<td>10.24</td>
<td>21.3</td>
</tr>
<tr>
<td>55-69</td>
<td>744</td>
<td>1,182,584</td>
<td>1,589</td>
<td>39,820</td>
<td>3.99</td>
<td>12.59</td>
<td>29.96</td>
</tr>
</tbody>
</table>

Notes
(1) ABS Cat. 6360.0, Table 1.
(2) ABS Cat. 6360.0, Tables 15 and 16, taking the midpoints of the dollar ranges.
(3) Col (2)/1.
(4) Taxation Statistics 2003/4, Personal Tax, Table 12, total (i.e. gross) income less pension income.
(5) Raw = Col (3)/(4). Scaled = Raw * scaling factor such that Col(2)*0.15*scaling factor = 0.5 per cent of GDP.
(6) ABS Cat. 6360.0, Table 10, 'total superannuation balance' which gives the median balance. The median is scaled to the required mean value by a constant factor that ensures that the total earnings taxes = 0.2 per centGDP.

Having calibrated our superannuation tax to GDP ratios for 2003/4 to those of the IAA (2006), we then project these out to 2050 based on the population projections used in Table 1. In the first case, which we call the base case, we assume no change between 2004 and 2040 to the contribution rates used in Table 2 that were calibrated to the IAA tax revenue figures. Table 3 shows that our projected tax revenues from the three superannuation taxes are, not surprisingly, very close to those of the IAA (2006).

1 An additional source of 'error' is that we use median superannuation balance instead of the mean in our calculation.
The base case supports the IAA’s main conclusion: the benefits tax will remain an insignificant source of revenue and therefore eliminating it would not impact significantly on total tax revenue. The earnings tax increases in relative importance due to the increased assets under management. The contributions tax revenue declines slightly in 2040 due to a relative decline in contributions as the working population declines.

**Alternative Scenarios: Higher Contribution Rates**

We then set up two alternative scenarios where the contribution rates of the older age groups are assumed to gradually increase up to the year 2025. In the first scenario, by 2025 15-34 year olds continue to pay 9 per cent into superannuation, but 35-44 year olds pay 12 per cent, 45-54 year olds pay 15 per cent and 55-69 year olds pay 20 per cent. In the second scenario, the contribution rates of older workers are assumed to increase even more: 15-24 year olds continue to pay 9 per cent into superannuation, 25-34 year olds pay 12 per cent, 35-44 year olds pay 15 per cent, 45-54 year olds pay 20 per cent and 55-69 year olds pay 30 per cent. The second scenario therefore exhibits a steeper increase in age-specific contribution rates than the first. However, even the second scenario is plausible. As does the first scenario, it assumes for example that 15-34 year olds continue to pay 9 per cent into superannuation. Only people over 34 years of age increase their contribution rates above the current statutory 9 per cent.

**Table 3: Projections of Superannuation Taxes**

<table>
<thead>
<tr>
<th></th>
<th>Base Case</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contributions tax</td>
<td>Earnings tax</td>
<td>Benefits tax</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0.50</td>
<td>0.50</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>2025</td>
<td>0.45</td>
<td>0.51</td>
<td>0.43</td>
<td>0.45</td>
</tr>
<tr>
<td>2040</td>
<td>0.42</td>
<td>0.49</td>
<td>0.63</td>
<td>0.59</td>
</tr>
</tbody>
</table>

**Higher contribution rates: Scenario 1**

|                      | Contributions tax | Earnings tax | Benefits tax |
|                      | (per cent of GDP) |             |             |
| 2025                 | 2.07      | 0.85    | 0.39       |
| 2040                 | 1.94      | 1.81    | 0.81       |

**Higher contribution rates: Scenario 2**

|                      | Contributions tax | Earnings tax | Benefits tax |
|                      | (per cent of GDP) |             |             |
| 2025                 | 2.75      | 1.00    | 0.48       |
| 2040                 | 2.58      | 2.25    | 1.03       |

These alternative scenarios imply increases in superannuation assets and therefore in the benefits tax to GDP ratio (Table 3). In our first scenario, the
benefits tax would raise 0.81 per cent of GDP in tax revenue by 2040, while in the second scenario it would raise 1.03 per cent in tax revenue of GDP. Our upper limit projection of 1.03 per cent of GDP may not be regarded as large but is considerably greater than the 0.05 per cent of GDP currently collected through the benefits tax (the figure according to the IAA). Our projected numbers need to be carefully interpreted. Without any increase in the contribution rate the benefits tax would have raised revenue of 0.33 per cent of GDP (the IAA figure and our figure). That revenue is now clearly foregone. Our higher figure of 1.03 per cent is based on the assumption that contribution rates would have increased anyway without the incentive of the benefits tax exemption, for reasons suggested in the introduction. A further qualification is that our projected foregone revenue ignores some labour supply effects and other general equilibrium effects. For example, the additional investments into superannuation would have incurred (greater) tax liability in their alternate investment vehicles. We have not calculated the tax revenue forgone from non-superannuation investment assets.

We now turn our attention to the benefit tax concessions that result in only a minority of beneficiaries actually paying the benefits tax (IAA, 2006). The calibration of our base case implies that the net effect of the concessional treatment of superannuation benefits is that only 13 per cent of retirees pay the benefits tax. We now remove the effect of the tax concessions and consider the superannuation revenue government would receive if all retirees paid a 15 per cent exit tax on their superannuation benefits. Results are shown in Table 4. The foregone revenue to government is now much larger - between 2.64 and 8.2 per cent of GDP depending on the assumptions about future contribution rates. The point of this exercise is to show the revenue that the government could have raised by doing in a sense the opposite of scrapping the exit tax, namely scrapping the tax-free threshold and taxing all superannuation benefits at 15 per cent. A clawing back of revenue of this magnitude would substantially offset the fiscal cost of population ageing which the Productivity Commission (2005) projects will amount to 6 per cent of GDP by 2045.

Table 4: Benefits Tax with No Exemptions or Concessions

<table>
<thead>
<tr>
<th></th>
<th>2003/4 Rates</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>per cent of GDP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0.40</td>
<td>0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>2025</td>
<td>1.67</td>
<td>3.11</td>
<td>3.84</td>
</tr>
<tr>
<td>2040</td>
<td>2.64</td>
<td>6.48</td>
<td>8.20</td>
</tr>
</tbody>
</table>

Our final calculation is to consider the cost of the concessional rate of tax (15 per cent) on superannuation contributions and benefits. The 15 per cent tax rate on contributions and on benefits is below the marginal rate for most taxpayers. We project the cost of this concession by assuming no change to either current tax rules or the 2006/7 personal tax schedules, and reverting to the assumption in Table 2 that only 13 per cent of superannuitants receive taxable benefits. Table 5 gives the results. The fiscal cost of the concessional tax rate on contributions would increase, from 2004 to 2040, from 0.48 per cent to as much as 2.49 per cent; and the fiscal cost of the benefits tax concessions would increase from 0.02
per cent to 1.03 per cent. Both of these tax concessions could not be abolished because that would imply double taxation. But the fiscal cost of either of them is projected to increase substantially subject to our maintained assumptions.

### Table 5: Total Cost of Superannuation Concessional Tax Rates

<table>
<thead>
<tr>
<th></th>
<th>Current Contribution Rates</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contributions tax</td>
<td>Benefits tax</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(per cent of GDP)</td>
<td>(per cent of GDP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0.48</td>
<td>0.02</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td>0.44</td>
<td>0.08</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>2040</td>
<td>0.41</td>
<td>0.13</td>
<td>0.54</td>
<td></td>
</tr>
</tbody>
</table>

|                  | Higher Contribution Rates: Scenario 1 |         |         |         |
|                  | Contributions tax          | Benefits tax | Total   |
|                  | (per cent of GDP)          | (per cent of GDP) |         |
| 2025             | 1.97                       | 0.16    | 2.13    |
| 2040             | 1.85                       | 0.32    | 2.18    |

|                  | Higher Contribution Rates: Scenario 2 |         |         |         |
|                  | Contributions tax          | Benefits tax | Total   |
|                  | (per cent of GDP)          | (per cent of GDP) |         |
| 2025             | 2.65                       | 0.48    | 3.13    |
| 2040             | 2.49                       | 1.03    | 3.52    |

Note: Contribution tax concessions = \( \sum (t_i - 0.15)C_i \) where \( C_i \) is the super contribution and \( t_i \) is the tax rate for the mean income earned at age \( i \) (data from table 2). Benefits tax concession = \( \sum (t_i - 0.15)B \) where \( B \) is lump-sum benefit taken at age 65 subject to the lump-sum tax in excess of the tax-free threshold and with only 13 per cent of retirees taking a lump-sum.

### Conclusion

Our calculations indicate first that the revenue forgone from eliminating the superannuation benefits tax could be greater as a share of GDP in coming decades than now — in the order of one per cent of GDP (Table 3). This assumes that contribution rates would increase irrespective of the new tax concessions. Second, and more importantly perhaps, we show that the tax concessions that currently apply to contributions and benefits, in terms of tax-free thresholds on benefits and the low rate of 15 per cent, would become very substantial if individuals increase their contribution rates as expected (see Tables 4 and 5).

This conclusion is subject to the important qualifications that we noted. In particular, although we have allowed for demographic projections we have ignored future changes in the rates of superannuation coverage by age group, which as we said, are likely to have budgetary implications working in opposite directions. We also ignore general equilibrium effects through, for example, labour supply and national saving.

The analysis does not overturn some arguments in favour of eliminating the benefits tax that we also discussed above. Nevertheless, the potential size of future fiscal costs suggests that the policy changes announced in the 2006 Budget
may well be revisited. This implies that the uncertainty surrounding superannuation policy is likely to continue.

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Appendix

Some simple algebra can illustrate that the TTE and ETT cases yield identical values of superannuation assets at retirement, and therefore identical tax revenue in the long run, in a hypothetical scenario defined by a common tax rate on both contributions and end benefits, and by the absence of tax-free thresholds or other tax concessions.\(^2\) The significance of this point is that, under those assumptions, it would make no difference to forward looking governments and investors whether tax is levied on the way into the fund or on the way out. To see this, let \(S_i\) be the superannuation contribution in period \(i\), \(r_i\) the return on the superannuation assets in period \(i\), \(t^c\), \(t^i\) and \(t^b\) the tax rates on contributions, income on fund assets, and end benefits respectively, \(B_n\) the value of superannuation assets at retirement, and \(n\) the number of periods of superannuation contributions. Assume that contributions are made at the start of each period and that tax is calculated on end of period values. The general expression for \(B_n\) is

\[
B_n = \left(1 - t^b\right) \left(\sum_{i=1}^{n} S_i \prod_{j=i}^{n} \left[1 + r_j \left(1 - t^i\right)\right]\right) \left(1 - t^c\right)
\]

\(1\)

It is clear that TEE (with \(t^c=x, t^i=0, t^b=0\)) and EET (with \(t^c=0, t^i=0, t^b=x\)) would yield the same value of \(B_n\). Of course in Australia and other countries this equivalence breaks down due to tax free thresholds on superannuation benefits and other complexities in the tax laws. For example, in the case of a threshold \(\kappa\) as a proportion of benefits, \((1)\) would be modified as follows:

\[
B_n = \left(1 - t^b\right) \left(\sum_{i=1}^{n} S_i \prod_{j=i}^{n} \left[1 + r_j \left(1 - t^i\right)\right]\right) \left(1 - \left[1 - \kappa\right] t^b\right)
\]

\(2\)

in which case TEE and EET would not yield the same value of \(B_n\), given the same tax rates. Currently in Australia \(\kappa B_n=129,751\) (and, pre-july 2007, nominal \(t^c=t^i=t^b=0.15\)).

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References


Bloom, D., D. Canning and J. Sevilla (2003), The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change, Rand, Santa Monica, CA.

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\(^2\) We are grateful to Peter Stemp for pointing this out.


*The authors thank an anonymous referee, Peter Stemp and Graeme Wells (the Editor) for comments that have substantially improved this paper. The usual disclaimer applies.*
Climate Policy: Where To and How?

Frank Jotzo

Climate change policy has become headline news and a key policy concern in Australia. Several factors have combined to elevate the issue, including the message from the Stern Review that climate change is a risk to future economic growth, firmer science on climate change and growing realisation of grave risks from climate change. Al Gore's movie, *An Inconvenient Truth*, has undoubtedly played a role to elevate climate change in the public perception, and the ongoing drought has given immediacy to environmental issues generally. Media reporting on climate change issues is pervasive, opinion polls show support for policy measures to address climate change, and industry increasingly voices support for greenhouse gas policy.

The Australian federal government places strong emphasis on protecting the economic benefit from abundant fossil fuels along with industries that heavily use them. This has translated into a preference for technology policy over emissions pricing, and was a factor in rejecting the Kyoto Protocol. Recently however, the government has responded to mounting political pressure with a Prime Ministerial task group on options for emissions trading, and an apparent revision of its opposition against using price mechanisms. Nevertheless, policy to limit greenhouse gas emissions remains politically problematic because of the costs it may impose on industries and consumers, especially in the absence of broad-based international action.

At the time of writing in February 2007, there is no clear roadmap for climate policy internationally. The nature of greenhouse gases as a global externality arising from most aspects of economic activity means that the international policy dimension is crucial. Emissions will need to be reduced all over the world to limit the extent of future climate change, but strong incentives for free-riding and thorny issues of international equity make cooperation difficult. Countries have differing interests according to their endowments, circumstances and stage of development, and views diverge on what are the right instruments for greenhouse gas control.

This article is a backgrounder to the climate policy debate as it is unfolding in Australia, in the global context. It gives a perspective on current policy discussions, and attempts to draw out the reasons for some of the heatedness in the current debate. The paper first lays out the broad picture on climate change, policy and economics; next, developments in international climate policy are reviewed; then Australia's circumstances and policy options are discussed, including aspects of emissions trading that are likely to figure in the policy debate in the immediate future.

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Climate Change, Policy and Economics

Climate science

The scientific basis for human-induced climate change is beyond doubt. The latest report of the Intergovernmental Panel on Climate Change (IPCC, 2007) finds that the atmospheric concentration of carbon dioxide, the main greenhouse gas released from human activities, has increased from a pre-industrial value of about 280 to 379 parts per million in 2005, by far exceeding the natural range over the last 650,000 years (180 to 300 ppm). Based on current science, there is now very high confidence that the net effect of human activities has resulted and will continue to result in global warming.1

Global average temperature has increased by 0.76°C over the 20th century, and the last twelve years contained eleven of the warmest years on record. The warming trend is confirmed by observations such as retreating glaciers, reduced snow cover, losses of ice sheets, and sea-level rise. The IPCC's (2007) central projections for further warming are 1.8 to 4.0°C over the course of the 21st century, depending on what path future global greenhouse gas emissions take, with a 'likely' range of 1.1 to 6.4°C when taking into account other uncertainties.

Warming causes sea level rise through thermal expansion of the oceans, and changes in rain patterns and ocean flows. Warming increases the incidence of extreme heat events, and is expected to lead to more frequent and intense tropical storms, as well as more floods and droughts. Australian society is particularly vulnerable to reduced rainfall and increased prevalence of drought (Steffen, 2006a). Health impacts from greater incidence of heat waves and wider spread of vector-borne diseases may also be significant.

Large-scale changes in the Earth's climate have occurred in the past; the crucial difference now is that humans are an active force in planetary change. Changes interfere with the established natural and human systems and will generally be adverse. At moderate temperature increases, some areas of the world may benefit, but the likely net effect is negative, especially at higher levels of warming. Adapting will be difficult or costly for many human systems, and ecosystems will experience major change, with likely extinction of many species.

There is increasing concern about the risk of abrupt climate change. Changes in the earth system can be nonlinear as the system flips to a different equilibrium, and paleoclimatic information shows that major changes happened quickly in the past. The climate system is thought to be subject to positive feedback mechanisms such as polar ice melt leading to greater absorption of solar radiation, or the potential release of carbon stored in plants at higher temperatures. Risks of abrupt changes include a slowing of the Gulf stream which would cool northwestern Europe, changing monsoonal patterns affecting rainfall patterns in the Asia-Pacific region, and a small risk of polar ice shelves collapsing and raising sea levels by several metres.

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1 The IPCC Fourth Assessment Report of the physical science of climate change is to be released later in 2007; only the 'summary for policymakers' was available at the time of writing. A summary of the science as to around the year 2000 was provided in IPCC Third Assessment Report. Steffen (2006b) has a concise overview of recent scientific findings.
The Stern Review on the economics of climate change

The Stern Review (Stern, 2006) brought the debate about how to respond to the threat posed by climate change to the mainstream of economic policymaking. It is a comprehensive review of economic aspects of climate change, looking at both the potential future economic impacts of climate change (and the ‘costs of inaction’) and the economics of greenhouse gas control.

Stern argues for strong action to reduce greenhouse gas emissions, taken soon. The Review argues that climate change could have serious impacts on future growth and development, that the worst of the expected impacts and risks can still be avoided if action is taken soon, and that the long-term damages from climate change would be far greater than the costs of taking economies to a low-emissions path. Waiting or restricting action to only some countries will increase the costs, or make it impossible to limit warming to acceptable levels. The Review finds that in any event, adaptation will be necessary to climatic changes that the world is already committed to. It is worth noting that similar conclusions were drawn in the Australian context, in a report by the Energy Futures Forum, prepared by CSIRO and with some of Australia’s largest energy companies as well as non-government organizations involved (Energy Futures Forum, 2006).

The Stern Review has been criticised for overstating the economic costs of climate change, and much of the discussion among economists focuses on discounting of the future. The key findings under debate are that

... if we don't act, the overall costs and risks of climate change will be equivalent to losing at least five per cent of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20 per cent of GDP or more. In contrast, the costs of action — reducing greenhouse gas emissions to avoid the worst impacts of climate change — can be limited to around one per cent of global GDP each year. (Executive Summary)

Damage cost estimates of 5-20 per cent of GDP are much higher than in the mainstream of the literature. Part of the reason is that the modelling takes into account small risks of very bad outcomes, and that some non-market impacts are valued. But the bigger issue is that the analysis is done over the relatively long time span of two centuries, with an effective discount rate lower than in many established analyses. Thus the longer-term costs from climate change are taken into account to a greater degree than in many other studies.

The overall discount rate has two components: the rate of pure time preference as a measure of giving more weight to the present than to the future; and the elasticity of marginal utility, describing how utility per extra dollar decreases as people grow richer. The rate of pure time preference used in the Stern report is close to zero, thus rejecting the notion that future generations should be given less weight purely because they will live in the future (a small positive value allows for the possibility of extinction). This ethical judgment can be justified in considering an issue where current actions carry consequences many generations into the future. The overall dollar discount rate used by Stern however is positive, as the analysis takes into account that future generations will be richer and thus have a lower marginal utility of wealth. The parameter value
for this component of discounting has also been criticized as too low (Dasgupta, 2006), while others have argued that it is justifiable (Quiggin, 2006).

Stern was also criticized for overstating climate impacts and damages (Byatt et al., 2006) and for low damage cost estimates that do not adequately account for the risk of catastrophic future climate change (Baer, 2007). The report's findings on the costs of global action to drastically reduce greenhouse gas emissions have been much less under discussion. The headline cost estimate in the Review is one per cent of GDP over the next 50 years, with a range from -1 per cent (net gains) to 3.5 per cent, derived from a large range of models. This is for emissions paths consistent with atmospheric stabilisation at 500 to 550 ppm CO₂-equivalent, implying significant reductions below business as usual.

Juxtaposition of the estimates of '5-20 per cent climate change damage costs' versus 'one per cent greenhouse gas reduction costs' is used in the Stern Review to support the case for strong action to reduce greenhouse gas emissions. Any impression created that this is a cost-benefit-analysis however is wrong, as the two sets of numbers refer to different timescales and have different premises. In fact, it can be argued that the extremely long time horizons and uncertainties involved in climate change push cost-benefit analysis beyond its limits. Stern's core argument, that strong action to reduce greenhouse gas emissions is warranted as a precaution against future economic risks from climate change, could equally have been made without resort to numerical estimates — but then it would not have been nearly as prominent in the public debate.

Global greenhouse gas pathways

To slow and ultimately halt global warming, the concentration of greenhouse gases in the atmosphere needs to be stabilised. Current concentration is around 430 parts per million carbon dioxide equivalent (ppm CO₂-eq.), and rising around 2.5 ppm per year. There remains much uncertainty about what temperature increases particular levels of atmospheric concentration will translate to. As a point of reference, the mean from a broad range of models is for an eventual 2°C increase above current mean temperature for stabilisation at 450 ppm, and 3°C increase at 550 ppm (Stern 2006, Ch. 13). Impacts from climate change are expected to become rapidly more severe above 2-3°C warming.

The task implicit in limiting greenhouse gas concentration to such levels is staggering. Stabilisation at 450 ppm it would require global emissions to peak around 2010 and thereafter fall by seven per cent per year, or peaking around 2020 followed by five per cent reductions per year with temporary 'overshooting' to 500 ppm (Stern 2006:Ch. 8, based on Meinshausen et al, 2006). Stabilisation at 550 ppm could be achieved with global emissions peaking around 2020, then falling by around 2 per cent per year; or a peak around 2030 followed by annual reductions of around three per cent. Thus delaying action means that future policies would have to be much more aggressive. Either path to stabilisation at 550 ppm requires current emissions to be reduced by one quarter by the middle of the century, and halved by 2100.
Figure 1: A pathway to Stable Greenhouse Gas Concentrations

Note: Data relate to all greenhouse gas emissions.
Source: Data from SiMCaP EQW model (as in Meinshausen et al, 2006).

Actual global emissions have steadily grown since industrialisation, and continuation of this trend in the absence of climate policy implies a huge abatement task (Figure 1). Addressing climate change will require a drastic change in the nature of economic growth: 'de-carbonisation' is needed, so that more economic activity is compatible with lower emissions. This will require pervasive changes to energy and production systems, as well as changes in consumption patterns — but who should act, when and how, is contentious.

Table 1: Some International Indicators

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>100%</td>
<td>1.5%</td>
<td>4.1</td>
<td>7.9</td>
</tr>
<tr>
<td>China</td>
<td>17.3%</td>
<td>4.5%</td>
<td>3.5</td>
<td>5.0</td>
</tr>
<tr>
<td>India</td>
<td>4.4%</td>
<td>4.5%</td>
<td>1.1</td>
<td>2.7</td>
</tr>
<tr>
<td>Europe (EU-25)</td>
<td>15.4%</td>
<td>-1.2%</td>
<td>8.7</td>
<td>23.8</td>
</tr>
<tr>
<td>United States</td>
<td>22.3%</td>
<td>1.3%</td>
<td>19.9</td>
<td>35.4</td>
</tr>
<tr>
<td>Australia</td>
<td>1.3%</td>
<td>2.0%</td>
<td>17.2</td>
<td>27.2</td>
</tr>
</tbody>
</table>

Note: Negative emissions growth since 1990 in the EU is to a large extent due to the inclusion of Eastern European countries which experienced industrial collapse and restructuring in the 1990s.

Ther e is a large literature on (and much debate about) what future global emissions trajectories might look like, in the absence of climate policies. Extrapolation of past emissions growth in the Figure is merely used to illustrate the principle.
Emissions are growing fastest in industrialising economies such as China and India, which are set to drive global emissions growth into the future, even if emissions from developed countries were to remain constant or fall (see indicators in Table 1). Most developing countries are still at low levels of emissions per capita, and this forms the basis for many poorer countries' claim to development without greenhouse gas constraints. Yet if developing countries were to reach the same levels of per-capital emissions as now prevail in rich countries, unacceptably high levels of global warming would result.

International Climate Policy

Climate change is a global externality, so policy needs international cooperation to avoid a 'tragedy of the commons' outcome, but struggles to achieve it. The difficulty is exemplified by the stalemate between the United States (and other rich countries including Australia) and developing countries over who should limit emissions. The Bush administration has pointed to future emissions growth being concentrated in China, India and other developing countries, while they in turn point to industrialised nations' greater historical responsibility for greenhouse gas emissions, and greater ability to pay.

The Kyoto Protocol

Practically all countries have signed and ratified the 1992 United Nations Framework Convention on Climate Change (UNFCCC). The Convention's objective is 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system', and it includes the principle of 'common but differentiated responsibilities', that is the notion that industrialized nations should lead the way in addressing global climate change.

The UNFCCC is the framework for most international climate policy to date. The 1997 Kyoto Protocol as an instrument to the UNFCCC stipulates that industrialised countries (Europe, Russia, North America, Japan, Australia and New Zealand) collectively are to reduce their emissions by five per cent below 1990 levels, over the Protocol's first 'commitment period' 2008-12. Targets are differentiated between countries. To make compliance easier, the Kyoto Protocol allows trading of permits between countries (emissions trading), as well as using offset credits from emissions reduction projects in developing countries (under the Clean Development Mechanism, CDM).

The Kyoto Protocol entered into force in 2005, and has to date been ratified by 168 countries, including all major nations except the United States and Australia, who cited potential adverse economic effects (discussed below) and the lack of developing country targets as reasons for their withdrawal. Indeed, by 2012 the Protocol is expected to reduce global emissions by only one or two per cent below what they otherwise would have been, a far cry from the required future turnaround in global emissions paths. The main reason for this modest impact is that developing countries including China and India do not have targets, and the United States has withdrawn.
However, proponents argue that the Protocol's first period is only a step on the way to more ambitious commitments, for a wider range of countries. The European Union is the driving force in the implementation of the Kyoto Protocol, and has committed to the targets approach by instituting emissions targets and trading. The scheme has suffered from political manoeuvring and over allocation of permits by national governments, which has resulted in great permit price volatility and a greater compliance task to be fulfilled outside the emissions trading scheme. Nevertheless, the scheme has sent a strong signal to industry and established the infrastructure for future policy.

Most Kyoto parties will not comply with their targets through domestic action alone and will need to rely on CDM offset credits for compliance, or ultimately on permit purchases from Russia or some Eastern European countries that may have excess permits. The CDM has seen strong interest and investment, predominantly from Western European governments and companies, and Japan. As of January 2007, around 1,500 projects in developing countries were in the pipeline, with combined expected emissions reductions of 1.7 billion tonnes of CO$_2$-equivalent by 2012 (UNEP Risoe Centre, 2007). For comparison, Australia's total emissions are around 0.5 billion tonnes per year. Most developing countries are pushing for expansion of the CDM post-2012.

A post-2012 international climate treaty?

Talks on a post-2012 agreement got underway in the UN climate negotiations, but progress has been slow. Australia and the United States have observer status in the negotiations on the future of the Kyoto Protocol, but are involved in a dialogue on broader options under the UNFCCC. Many players are waiting to see the stance of the next US administration, to come into power in 2009.

Political forums outside of the UNFCCC could facilitate progress, in particular the G8 process. The 2005 Gleneagles summit put climate change on the G8 agenda and sent a strong political message about its importance. An ongoing dialogue also includes the major energy users outside the G8 group (including China, India, South Korea, Indonesia and Australia in the Asia-Pacific region).

The EU has made it clear that it is prepared to consider more stringent reduction targets for itself, that it expects newly industrialized countries to take on targets, and that it is seeking other forms of commitments from less advanced countries. Whether and to what extent other rich countries will be prepared to take on post-2012 emissions targets is still unclear. Middle-income countries including South Korea and Mexico (both members of OECD but without Kyoto targets) might be drawn into a post-2012 scheme.

Most developing country governments however oppose the suggestion of future emissions targets for them. India has taken a particularly strong stance, describing calls for developing country commitments as 'shrill' and 'surreal' (Earth Negotiations Bulletin, 2006). China is predisposed toward domestic measures to improve energy efficiency in the context of energy security and for more cost-effective manufacturing (Lu, Pan and Chen, 2006), and has adopted a goal of reducing energy intensity of its economy (units of energy per unit of GDP) by 20 per cent over the period 2006-10. With rapid GDP growth, absolute emissions will nevertheless continue rising. Many lower-income developing countries meanwhile
are putting the spotlight on expected adverse climate change impacts and the vulnerability of their societies, and are calling for assistance from the developed world to help adapt to climate change.

One option for an effective future international climate policy framework that revolves around quantitative commitments may be to break down the dichotomy between countries with targets and those without, create a menu of different types of commitments, and allow for more flexibility in meeting them. Various options have emerged from international initiatives and dialogues outside the negotiations. Recent examples are the 'Pocantico Dialogue' (Pew Center, 2005), which brought together high-level representatives from governments, multinational businesses, and civil society from a number of countries including the United States and Australia; and the 'Sao Paulo proposal', a collaborative project between Brazil, China, India and South Africa, supported principally by the European Union (Building and Strengthening Institutional Capacity on Climate Change, 2006).

Many such post-2012 proposals have emissions targets and trading at their core, but with a sliding scale of the type and degree of commitments, according to countries' stage of development and national circumstances. This makes for a broad spectrum of commitments, from highly flexible ones that apply to only parts of the economy at one end, to Kyoto-style national targets at the other (for an overview see Jotzo and Pezzey, 2006). Elements proposed include:

- intensity targets, where target levels are linked to future GDP, to compensate for activity-linked fluctuations;
- non-binding targets as entry-level commitments for risk-averse developing countries;
- sectoral targets to cover specific industries in the largest producing countries for each industry;
- price caps in permit trading to protect permit buying countries from the risk of overly high compliance costs;
- policy-based commitments without fixed emission limits; and
- recognition of funding provided for technology development or for climate change adaptation in poorer countries.

Alternative post-2012 climate policy architectures

Various alternative proposals to the targets and timetables approach exist. In the Australian discussion, the most prominent proposal is the 'blueprint' by McKibbin and Wilcoxen (2002). Each national government would issue short-term permits and thus control the maximum permit price, while emitters would own long-term permits. This would create a hybrid system of emissions control by quantity and price, without international emissions trading.

Economic theory suggests that emissions control by price (taxation) would be the most efficient instrument, as it promises lower cost uncertainty, but the huge revenues generated by emissions taxes have proved to be politically unacceptable. Opposition by emitters could be defused through taxation thresholds held by emitters as property rights (Pezzey, 2003), but political momentum remains with emissions targets and trading.

Other proposed schemes would directly support actions that may result in lower emissions. For example, Schelling (2002) suggested that rich countries
should make large-scale financial contributions to help finance energy-efficient and
de-carbonised technologies in the developing world, in a collaborative effort akin
to the Marshall Plan, or NATO during the cold war.

Technology policy and the Asia-Pacific Partnership

The Asia-Pacific Partnership on Clean Development and Climate (AP6) is an
initiative by Australia, China, India, Japan, Republic of Korea and the United States
for addressing climate change through technology development, outside the
UNFCCC framework. Australia has been a driving force behind the initiative. The
stated purpose of AP6 (2006) is to:

create a voluntary, non-legally binding framework for international cooperation to
facilitate the development, diffusion, deployment, and transfer of existing,
emerging and longer term cost-effective, cleaner, more efficient technologies and
practices.

AP6 was announced in January 2006. Sector-specific task forces have been
formed, and action plans formulated for improvements in the use of existing
energy and industrial technologies. Funding for AP6 projects so far has been for
too limited to expect progress on any 'breakthrough' technologies, or on
widespread uptake of best practice technology. Australia has committed A$100
million (and a further A$500 million for clean energy projects in Australia, outside
AP6), and the US administration pledged US$ 52 million (subsequently blocked by
the House of Representatives). This compares to energy sector investment needs
of hundreds of billion of dollars annually in the AP6 economies (International

Australia is particularly interested in developing 'clean coal' technology. The
key technology is capture and underground storage ('geosequestration') of carbon
dioxide, which could drastically reduce emissions from coal-fired power stations,
but would drive up the price of electricity generated (Metz et al, 2005). Carbon
capture and storage will need large-scale investment to prove it at a commercial
scale, and to bring down costs. Even then, it is likely to remain significantly more
expensive than many other abatement options.

For policy, the question is whether technology development needs direct
government intervention, or whether it can be induced through market price
signals, for example under emissions trading. The dominant view in the current
debate is that both price signals and government-sponsored technology policy are
needed for an effective and efficient outcome. Externalities in technology
development create a need for government support, but emission pricing can also
induce significant amounts of innovation — and crucially, price signals are needed
to for take up of new, cleaner technologies, and for demand-side substitution (see
Pezzey et al, 2006).

Movement in the United States?

Developments in the United States could be the pivotal factor for global climate
policy in the near to medium term. The Bush administration took a famously hard
line on climate change in its first term in office, rejecting the Kyoto Protocol,
refusing any policies that might reduce energy consumption, and casting doubt on climate change science. That position has gradually softened, in the context of a growing sense in society that climate change is a serious threat. The Bush administration now acknowledges that climate change is important, the President calling it a 'serious challenge' in the 2007 State of the Union address. Policies so far however have been limited to fuel standards and ethanol subsidies (in large part to reduce oil dependence), and funding for selected technology initiatives.

American greenhouse gas policy in recent years has been driven by the States. An agreement for emissions targets and trading is in place among Northeastern and Mid-Atlantic states (the 'Regional Greenhouse Gas Initiative', or RGGI), and California in late 2006 followed suit. Possible links to the EU emissions trading system are under discussion.

In the US Senate, several bills on climate change were introduced in recent years, most notably by presidential candidate McCain. Adoption of federal climate policy has become much more plausible after the Republican defeat in the mid-term elections (Pew Center, 2006). And importantly, pressure from business and civil society groups is mounting. In January 2007, a group of major energy and manufacturing companies and environmental organisations called for 'strong national legislation to require significant reductions of greenhouse gas emissions' (United States Climate Action Partnership, 2007). Major church groups have also begun to use their political influence to lobby for action against climate change.

**Australia's Policy Options**

Important policy choices are coming up for Australia. High reliance on greenhouse-intensive fossil fuels creates special challenges, but taking a leadership role in reducing emissions could be in Australia's long-term public interest. An opening may exist in 2007 to prepare the ground for sensible and forward-looking greenhouse gas policy.

**Australia's emissions and the Kyoto target**

Australia is likely to come in close to the Kyoto target of 108 per cent of 1990 emissions. This is because under accounting rules secured by Australia in the Kyoto negotiations, reductions in emissions from land-use change over time were included in computing national total emissions. Annual land clearing in Queensland, and carbon released as a consequence, was much higher in 1990 than it is now and than it will be in future. These reductions largely outweigh strong increases in emissions from the power sector and other sources, when using 1990 as the base year; but they are now largely exhausted. Emissions from the energy sector are already up by 35 per cent from 1990 levels, as a result of increased energy (in particular electricity) demand. The Australian Greenhouse Office (AGO, 2006) expects the energy sector to drive a continued rise in total emissions (see Figure 2).

It is somewhat ironic that Australia, having rejected the Protocol, is going to be one of the few countries close to complying with its target, without resorting to the Protocol's flexibility mechanisms. This also implies that ratification for Australia would come at no or low net cost, and quite possibly a net gain, in the
first Kyoto period to 2012. Modelling commissioned by the Australian Greenhouse Office (McKibbin, 2002, and ABARE, 2002) suggested impacts on Australia's GDP or GNP from the Kyoto Protocol at 2010 between 0.1 and 0.4 per cent if Australia ratified the Protocol, and between zero and 0.4 per cent without ratification. In one scenario, Australia was better off at 2010 ratifying than not.

**Figure 2: Australia's Greenhouse Gas Emissions**

![Graph showing Australia's greenhouse gas emissions from 1990 to 2020 with projection to 2030](image)


Ratifying the Kyoto Protocol would strengthen Australia's position in the UNFCCC negotiations, help counteract perceptions of Australia being obstructionist, and get a seat at negotiations on a possible second commitment period. That said, if the same Kyoto cap or a tighter target were to apply into the future, then compliance could be a real challenge. Longer-term policy choices are clearly more important than Australia's position on the Kyoto Protocol until 2012.

**Cost of greenhouse gas reductions**

Modelling of the economic impact of greenhouse gas reduction policies has traditionally been an important factor in the Australian climate policy debate, going back to the time before the Kyoto Protocol. The moderate cost estimates for Kyoto compliance have not been widely publicised, with recent emphasis on long-run scenarios. For example, a report by the ABARE (2006) models greenhouse gas reduction scenarios at 2050. Impacts on Australia's GDP in the main scenarios are in the range of two to 3 per cent at 2050, close to the global average. There is however one scenario where Australia suffers a 10.7 per cent GDP loss, derived from the highly unrealistic assumption that Australia implements a carbon tax eight times higher than the rest of the world. In a sign of how politicised the debate is, it is this latter number that has been most often cited, often taken out of context (for example in a speech by Prime Minister Howard in the House of Representatives on 16 August 2006).
Recent international analyses show costs of greenhouse gas mitigation to be manageable, even for large reductions of global emissions — see the Stern Review’s central cost estimate of around one per cent of global GDP by 2050, for significantly greater reductions than in the ABARE scenarios. Assumptions about future technologies are crucial, with many newer models allowing for faster technical progress induced by greenhouse gas policy (Grubb, Carraro and Schellnhuber, 2006).

Further, these global cost estimates presume that effective mitigation action is taken in all or most countries, and on most sources of greenhouse gas emissions. If the same level of global emissions reductions is to be achieved with a narrower base, then costs are higher.

The economic cost to each country depends principally on its endowment, and on any policies for international burden sharing, such as differentiated targets under emissions trading. As a high-income country, Australia would likely be expected to shoulder greater costs relative to the global average, and as a fossil fuel exporter may suffer from a decline in global energy demand.

Perspective is needed in interpreting economic cost impacts over half-century time spans. A 3 per cent GDP loss at 2050 implies that achieving the same level of material well-being (a trebling of GDP at annual average growth rates of 2.5 per cent) will be postponed from 2050 to 2051 — by itself hardly a compelling factor for the making of public policy.

What is Australia’s public interest?

The Howard government has made it clear that it sees Australia’s key interest in greenhouse gas policy in protecting the wealth bestowed by abundant fossil fuel reserves (see, for example, Department of the Prime Minister and Cabinet 2004). As the Prime Minister put it in his 2006 address to the Business Council of Australia (Howard, 2006):

[Ratifying Kyoto] could have damaged the comparative advantage this country enjoyed as a result of our abundance of fossil fuels and the importance of that abundance to Australia’s export and general performance. ... I do not intend to preside over policy changes in this area that are going to rob Australia of her competitive advantage in the industries that are so important to us.

Australia has large and easily accessible reserves of coal, the most CO2-intensive fuel. Coal accounts for around half of Australia’s energy production. At current extraction rates, Australia’s known recoverable reserves would last several hundred years. Around three quarters of coal mined is exported, and a significant share of domestic use is for energy-intensive export products such as aluminium and steel (ABS, 2006). Substituting away from coal is one of the most obvious greenhouse gas reduction measures globally, and reductions in coal export demand and penalties on CO2 emissions could devalue Australia’s resource stock.

Yet the importance of coal for the Australian economy can be overstated. Coal accounts for less than a quarter of value added in the mining industry, and mining overall contributes around four per cent of Australia’s GDP (ABS, 2006). In any event, in a future carbon constrained world, coal will be competitive only if there are economical ways of removing CO2 emissions. Alternative energy sources
by contrast will benefit from emissions constraints, especially nuclear and renewable energy sources. Australia has large uranium reserves, and great potential for renewable energy sources such as wind and solar. More broadly, the very notion that energy must be at the heart of Australia’s national economic interest can be challenged. History has shown that natural resource wealth is not necessarily a recipe for long-term economic prosperity (World Bank, 2006).

The other national interest consideration is of course climate change itself. Australia is vulnerable, in particular to changes in rainfall patterns. If the drying trend in South-East Australia were to be amplified, it would have major consequences not just for agriculture but for water supply to the majority of Australia’s population. To what extent water shortages during drought can be addressed through improved water management and pricing remains to be seen. Reducing the extent of climate impacts, and lowering the risk of abrupt change, is clearly in the long-term public interest. Heightened community expectations on climate change policy can be seen in this context.

The effect of Australian emissions on Australia’s climate is very small, due to the global nature of the greenhouse effect, and the long time lags in the climate system. Arguably, the primary value in Australian greenhouse gas reductions is in setting an example, and showing good faith, to help induce action globally.

**Domestic policy**

A less contentious aspect of climate policy, though one subject to large uncertainties, is adaptation to climate change. Governments clearly have a role to play in helping generate and make available the best available information about expected future changes, and in ‘mainstreaming’ climate change into other policy and planning processes. To name but a few, water resource management, agriculture, urban planning, public health, transport and energy infrastructure all will need to take account of expected future climatic changes.

Greenhouse gas policy is the more difficult issue politically. Cost-effective greenhouse gas policy (that is, achieving a given outcome at lowest possible cost) would require abatement action on all or most emissions sources, to a similar marginal cost of action. This includes not just power generation technologies, but demand-side energy efficiency improvements which constitute a large share of the low-cost emissions reduction potential in Australia (Allen Consulting Group, 2004). An often overlooked important plank is changes in consumption patterns. A cost-effective strategy requires that consumers be exposed to higher relative prices for greenhouse gas intensive goods and services, but would be politically sensitive.

Australian policy to date has been heavily focused on the supply side, using subsidies to induce the development of low-emissions technologies. As argued above, there is a role for such policy where specific technologies can be identified that show promise and that would not receive adequate investment under market conditions. But government spending would need to be very large in order to bring significant technological advance; and price signals or direct regulation will be needed for uptake of cleaner technologies.

Nuclear power has recently been put on the agenda. The Prime Minister’s nuclear energy review (Commonwealth of Australia, 2006) raised the spectre of 25 reactors replacing up to 17 per cent of Australia’s emissions in 2050 (compared to
a business-as-usual scenario of emissions doubling compared to 1990 levels), but highlighted that nuclear power would not be competitive with coal-fired generation unless carbon emissions are priced. Nuclear power is a low-emissions electricity source, but invariably raises safety concerns and is unattractive for private investors because of huge capital outlays and uncertainty (Owen, 2006).

There is no compelling reason that governments will necessarily pick the 'right' technologies. The current government clearly favours 'clean coal' and nuclear energy over renewable energy sources such as solar thermal, wind and other technologies. Yet all of these are more expensive than conventional fossil fuel based energy, and any of them could become competitive with further R&D and emissions pricing. Market mechanisms are generally seen as the best way to create broad-based and consistent incentives throughout the economy, necessary to achieve emissions reductions at least cost. As elsewhere in the world, permit trading appears the most acceptable way of creating a carbon price signal.

The Australian States have put forth a blueprint for a state-run national trading system (National Emissions Trading Taskforce, 2006), but achieving agreement between States on implementation would be difficult, and it appears that the initiative may well be superseded by a federal scheme. Federal government statements in early 2007 indicate that emissions trading is being considered — it is also Opposition policy. A 'Prime Ministerial Task Group on Emissions Trading' was formed late in 2006, to advise on a global emissions trading system in which Australia could take part, while preserving its advantage in fossil fuels. Task group members comprise five government officials, five representatives from energy and mining companies, and two representatives from financial and services industries. Given the narrow terms of reference and the composition of the group, it would be unsurprising if the recommendations (due in May 2007) turned out to be fairly defensive. However, the task group 'issues paper' calling for public comment (Department of Prime Minister and Cabinet, 2007) canvasses a wide range of options, and appears to open the door for the possible introduction of a domestic scheme even while there is no global scheme in place.

Some reflections on emissions trading

Emissions trading may well be in the interest of large parts of Australian industry, depending on the design of the scheme. Industry has a strong interest in a stable policy environment, and many businesses are probably already pricing in the possibility of future carbon constraints in their investment decisions, but suffer uncertainty about what form or magnitude such constraints might take. Business groups such as the Australian Business Roundtable on Climate Change are lobbying for long-term carbon price signals to be established. Rio Tinto recently made headlines by publicly supporting emissions trading 'because it provides for a least cost method of abatement and allows market forces, rather than government decision-making, to determine outcomes', and stating that the ambition of international cooperation 'should not be used as an excuse for inaction on the domestic front' (Rio Tinto, 2006).

A crucial design issue is allocation of permits. Polluters can be compensated by giving them a share of permits freely. Indeed, positioning to secure free
permits likely is a factor in recent industry support for emissions trading. If all or almost all permits are given away to existing emitters (‘grandfathering’), this can result in large windfall gains to industries that can pass on production cost increases — as experienced in the EU (Grubb and Neuhoff, 2006). A balance needs to be struck between the political necessity to compensate industry, and the interests of consumers and taxpayers. Permit allocation and other technical aspects of emissions trading were investigated in the late 1990s, by the AGO (1999).

Avoiding negative trade impacts on energy intensive industries such as steel or aluminium production is another sticking point. Australian producers might experience a competitive disadvantage from the increase in production cost under emissions trading, and some production might be shifted to countries where they are not penalised (‘carbon leakage’). Border tax adjustments may provide an interim solution to this problem (Saddler, Muller and Cuevas, 2006). In terms of overall effectiveness of the scheme, they are preferable to exempting whole industries from emissions trading. Sectoral targets for energy-intensive industries in a post-2012 international treaty encompassing the major producing countries may also reduce carbon leakage problems. For energy industries and particularly coal, it is important to recognise that challenges arise from policy in coal-importing countries, and that fossil fuel exports cannot be protected by domestic policy.

There is a range of other important aspects of emissions trading design. Broad coverage is needed for emissions pricing to yield cost-effective outcomes. Permit allocations should be defined over longer-term periods to provide robust investment incentives. Safeguards against overly large compliance costs may be needed, such as activity-linked allocations (‘intensity targets’) and a guaranteed price cap. Many of these options were canvassed by the state-based initiative (National Emissions Trading Taskforce, 2006).

The McKibbin-Wilcoxen proposal mentioned above has several features that may appeal to Australian policymakers. If adopted, it would be interesting to see whether its appeal to other countries would increase, in negotiations and policies for the post-Kyoto period. On the other hand, better designed (than the EU scheme) ‘conventional’ emissions trading would be more readily compatible with existing and emerging schemes internationally.

Concluding Remarks

In late 2006, the ground started shifting on climate policy in Australia. The Stern Review argued strongly that addressing climate change is an economic necessity: the risk that future climate change could undermine the physical basis for prosperity, and large-scale action to reduce greenhouse gas emissions should be taken soon. There is growing consensus that it is worth reducing climate risks, based on firmer scientific evidence, bolstered by greater public awareness and increased business preparedness to face the issue. Yet international cooperation to curb emissions faces formidable hurdles, and it is doubtful that comprehensive global action can be achieved quickly. Measures to adapt to climate change will be taken much more readily, as they yield local and national benefits.

As a major exporter and user of fossil fuels, Australia faces particular pressures, and to date this has translated into a defensive policy position. But
there is mounting pressure from civil society and increasingly business for meaningful policy. The current political setting might allow for the creation of a forward-looking and broad-based greenhouse gas policy that goes beyond government subsidies for selected technologies, and that includes carbon pricing. The winds of change in the United States should help this process along.

Australia's national interest on climate change transcends concerns about the profitability of existing energy industries. As the debate evolves, the argument that 'Australia should do nothing unless China and India cut their emissions' will likely hold less and less sway. Societies concerned about climate change will need to lead by example, and the principle that rich countries should act first goes right back to the UN Convention on Climate Change. Implementing meaningful greenhouse gas policies at home would strengthen Australia's position to work toward meaningful post-Kyoto international climate policy.

References


Quiggin, J. (2006), 'Stern and the Critics on Discounting', University of Queensland.


UNEP Risoe Centre (2007), 'CDM Pipeline January 2007', CD4CDM — Capacity Building for the CDM.


World Resources Institute (2007), 'Climate Analysis Indicator Tool', Version 4.0, Washington DC.

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Land Regulations, Housing Prices and Productivity

Alan Moran

Land in Australia is more abundant than in almost any other country in the world and urban land, like rural land and mineral wealth, ought to be a component of the nation's comparative advantage. Urban land use, however, is subject to strict State or Territory Government regulation on the supply of land for housing. This increases land prices and housing costs. Restraint of land supply also has a significant impact on commercial activities like shopping centres. Regulatory limitations on the availability of land for shopping centres dampen competitive pressures and bring about higher retail prices.

Land costs are incorporated in most commercial activities. Hence, beyond the direct effects on housing and commercial property, measures that raise the price of land have a pervasive effect in raising costs throughout the economy.

An important by-product of regulatory-inflated land and housing prices is the consequential soaking up of savings that might otherwise be allocated to productive investment. A wind back of restrictions on land availability for home building and other urban uses would reduce housing prices and costs for land intensive urban activities as well as releasing savings for beneficial uses.

This paper examines the impact of urban development regulations on land and housing prices and explores the consequences for national savings and investment.

Impact of Regulations for Urban Development Activities

Zoning and Australian house prices

Government restrictions on the production or sale of a product will invariably cause its price to rise. So it is with housing, where the availability of land for new housing is highly regulated.

Policies to introduce such restrictions are often motivated by ideological opposition to 'urban sprawl', a concern that is particularly groundless in Australia where only 0.3 per cent of the land area is urbanised. Sometimes urban land rationing is based on (largely unfounded) claims that development beyond designated boundaries will add unduly to infrastructure costs. In point of fact, it is often cheaper to build infrastructure in greenfield areas than to renew it in existing urban areas; in any event, if house buyers are willing to pay the costs of infrastructure there should be no government concern.

In many cases, zoning restraints reflect a wish to prevent development in areas that have been set aside as park and recreational land. This is notably the
case in Sydney, where Australia’s most restrictive planning regime (and highest housing land costs) is in place.

Land use restrictions also stem from a wish to restrict outward development so that a denser metropolitan area is created. At a local level this goal is sometimes frustrated by opposition to high rise and similar development. Such opposition further accentuates the additional costs of the original program aimed at preventing urban spread and bringing greater population densities.

These pressures are reflected in prices. The Housing Industry Association (HIA) has estimated new land and house package costs over time. These are illustrated in Table 1, which, to allow meaningful comparisons standardises houses to a 135 square metre house and a 700 square metre block. New house prices are highly correlated with median prices of all houses.

Table 1: New Land and House Package Costs

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Land</td>
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<td>$29,400</td>
<td>$107,100</td>
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<td></td>
<td></td>
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<td></td>
</tr>
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<td>Land</td>
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<td>$49,000</td>
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</tr>
<tr>
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<td>$75,000</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land</td>
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<td>$135,000</td>
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<td>$70,000</td>
<td>$112,000</td>
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</tr>
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<td>Land</td>
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<td>$80,974</td>
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<td>House</td>
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<td>$60,000</td>
<td>$109,000</td>
<td>8.1</td>
</tr>
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<td>Adelaide</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Land</td>
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<td>$140,000</td>
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<td>$40,000</td>
<td>$90,000</td>
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</tr>
<tr>
<td>CPI</td>
<td>20.5</td>
<td>61.6</td>
<td>108.9</td>
<td>150.6</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Sources: Sydney: REI of NSW; Melbourne, Brisbane and Adelaide: UDIA; WA: HIA.

The building component of new house prices has changed little in real terms since 1973, having risen little more than the average 6.3 times increase in the CPI. This is in spite of regulatory impositions, especially those concerning energy where recent measures according to the industry increased cost by some $7,000 plus per home (HIA, 2005).

By contrast, since 1973 the price of the land component has outpaced general inflation by between tenfold (Adelaide, albeit from a low base) and threefold (Melbourne). Sydney, which has long experienced higher prices than elsewhere in Australia, saw an increase eight times greater than the overall rate of inflation over the period.
Property price increases may be expected to exceed general price increases in availability-limited high demand areas (the so-called 'positional' goods, with harbour views or close to high fashion shops and so on). But there is no shortage of land for housing in general especially given the very small share of the national land stock that built-up areas comprise. Still less is there a land shortage for new houses which are overwhelmingly built on the urban fringe. It follows that changes in the demand for urban land are unlikely to have a significant effect on average price levels of land for housing. This is especially so since average land prices in its alternative farming use are only around $350 per hectare. At about 10 housing blocks per hectare, this represents a trivial component of the value of a house and land package.

In present day terms the costs of providing road, sewerage, water and other services to a new block of land in Australian outer urban areas is $40,000 to $60,000 in most places.

The costing for a new sub-division in South Australia just outside Adelaide's urban growth boundary is provided in Table 2. The blocks were offered at between $44,950 (for 400 square metres) to $58,950 (for 600-790 square meters) inclusive of holding costs, regulatory fees, sales costs and profits (Day, 2006).

### Table 2: Land Allotment Costing

<table>
<thead>
<tr>
<th>Nature of cost</th>
<th>Cost per allotment</th>
</tr>
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<tbody>
<tr>
<td>Civil works construction costs including:</td>
<td>$30,415</td>
</tr>
<tr>
<td>Establishment &amp; Disestablishment</td>
<td></td>
</tr>
<tr>
<td>Sedimentation Control Works</td>
<td></td>
</tr>
<tr>
<td>Allotment filling</td>
<td></td>
</tr>
<tr>
<td>Road Formation works</td>
<td></td>
</tr>
<tr>
<td>Roads, pavements &amp; gutters</td>
<td></td>
</tr>
<tr>
<td>Hot-mix seal coat</td>
<td></td>
</tr>
<tr>
<td>Stormwater drainage works</td>
<td></td>
</tr>
<tr>
<td>Sewer reticulation</td>
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<tr>
<td>Water reticulation</td>
<td></td>
</tr>
<tr>
<td>Common Service Trenching</td>
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</tr>
<tr>
<td>ETSA/Telstra conduits materials</td>
<td></td>
</tr>
<tr>
<td>Survey Certificate</td>
<td></td>
</tr>
<tr>
<td>CITB levy</td>
<td></td>
</tr>
<tr>
<td>Sewer</td>
<td>$2,495</td>
</tr>
<tr>
<td>Water Supply</td>
<td>$500</td>
</tr>
<tr>
<td>Survey &amp; Engineering</td>
<td>$3,000</td>
</tr>
<tr>
<td>Planning, registration, title fees</td>
<td>$110</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$36,520</td>
</tr>
</tbody>
</table>

Source: Figures extracted from a 70 Allotment Stage for a development within the City of Onkaparinga with sales starting in mid 2006.

These figures are consistent with estimates prepared by UrbisJHD for the Property Council (2006) which examined 13 broadhectare subdivisions across Australia and put land preparation per unit in the range $26,600 to $60,000.

The value per block of land in excess of $60,000 is caused by regulatory constraints on availability. That value is an ‘economic rent’. It does not represent
real worth from an economy-wide perspective but is very important in terms of the
distribution of wealth and income.

For land selling above these costs some of the economic rents that would
otherwise accrue to landowners are captured by governments in 'infrastructure
charges'. The average price of a block of land in Sydney, is estimated at $460,000
in 2006 (see Table 1, though it should be noted that to enable comparisons the
average block size has been held constant and newer blocks tend to be smaller
than the 700 square meters standard). The average Sydney block price
incorporates some of these costs, representing stamp duty on land and
'development' contributions which Urbis|HD estimated to be at least $49,000.

In its Inquiry into First Home Ownership, the Productivity Commission (PC,
2004) understated the importance of supply constraints in pushing up prices. The
report saw accretions to supply as being relatively low and therefore of limited
influence in the market as a whole. In point of fact new house supply can respond
quickly to increased demand and does so where land is not rationed. For
example, in Houston, the vast expansion in demand that followed Hurricane
Katrina placed only minor upward movement on house prices (Houston Chronicle

The PC also placed undue emphasis on the effect of new demand being
dominated by people trading up in house value. This may in part be a
consequence of land scarcity causing prices of new houses to be beyond the reach
of first home buyers. More pertinently, it matters little who is buying the new
property since if it is people trading up this should release stocks of existing
houses and depress their prices.

Glaeser, Gyourko and Saks (2005) analysed housing costs in the context of
different variables. They developed a proxy for regulatory restraints though
noting that, 'The very richness of the regulatory environment means that there is
no one law or regulatory structure that would allow us to identify some
metropolitan areas as being more onerously regulated compared with others.'
Their analysis indicated that in areas where the regulatory restraints were
considerable the effect of a 10 per cent increase in demand led to a $60,000 price
increase; in areas with lower levels of regulatory restraint, the increase was
$5,000.

*Australian house prices in the absence of land price inflation*

In no Australian city can it be argued that space is itself a constraint in land
availability. Sydney is sometimes cited as being hemmed in by mountains and
national parks. Aside from the fact that the latter can be redefined, it is clear from
an examination of the Cumberland areas out to Penrith and up towards Richmond
that space is available for millions more houses — and there is the added
possibility of development beyond the Blue Mountains.

The bottom line is that zoning restrictions are driving up land prices and
housing costs. This is clearly evident from estimates of house prices based on the
assumption that land prices had increased only in line with the general level of
inflation; a not unreasonable assumption given the abundance of land and the
experiences of jurisdictions in many US states and in Germany, which have not
experienced accelerated land price inflation.
Clearly, had such regimes prevailed in Australia, the new house/land package would be considerably reduced. In Sydney, had land prices increased in line with general inflation, this would have meant house/land packages in 2006 at $185,000 rather than the actual $588,850; for Melbourne the respective numbers would have been $155,470 rather than $219,000; for Brisbane they would have been $156,100 rather than $247,000; for Perth $150,000 rather than $379,000; and for Adelaide $102,600 rather than $230,000. Table 3 illustrates this.

Table 3: Typical New House Prices in Capital Cities

<table>
<thead>
<tr>
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<td></td>
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<td></td>
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<tr>
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<td>Total</td>
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<td>21.0</td>
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<td>$185,580</td>
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<tr>
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<tr>
<td>Total</td>
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<tr>
<td>Total</td>
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<td>$247,000</td>
<td>10.7</td>
<td>$23,000</td>
<td>$156,100</td>
<td>6.8</td>
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<tr>
<td>Land</td>
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<td>Total</td>
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<td>20.5</td>
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<td>$149,950</td>
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<td>Adelaide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>$2,000</td>
<td>$140,000</td>
<td>70.0</td>
<td>$2,000</td>
<td>$12,600</td>
<td>6.3</td>
</tr>
<tr>
<td>House</td>
<td>$12,000</td>
<td>$90,000</td>
<td>7.5</td>
<td>$12,000</td>
<td>$90,000</td>
<td>7.5</td>
</tr>
<tr>
<td>Total</td>
<td>$14,000</td>
<td>$230,000</td>
<td>16.4</td>
<td>$14,000</td>
<td>$102,600</td>
<td>7.3</td>
</tr>
<tr>
<td>CPI</td>
<td>20.5</td>
<td>150.6</td>
<td>6.3</td>
<td>20.5</td>
<td>150.6</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Source: Derived from HIA (2006) Standardised to a 135sqm house and a 700 sqm block.

Effects of zoning regulations on other types of property

Not only does land rationing mean higher prices for housing but there is an effect on all other activities. Inflated land costs are likely to have particular importance in land intensive industries, including shops and hotel accommodation.

In the case of hotels, the land component of cost varies with a number of factors, notably the hotel's residential standard. For budget hotels in Sydney and Melbourne, industry sources estimate the land component of total costs to be
approximately 20-25 per cent. For high end accommodation, the land component would be under 10 per cent. The implications of land price inflation for these hotels would also entail a doubling of land costs and charges 10 to 20 per cent above the unrestricted market rate for budget and high end accommodation respectively. This is likely to bring about misallocations of income, in the case of hotels, by reducing activity in the tourism market.

Similar issues are apparent in the case of shops and other commercial premises. These facilities share a further cost penalty as a result of locational requirements and planning arrangements that are designed to prevent competition between centres. City planners offer shopping centres protection from new centres unless a need for such a centre can be 'proved'. The deliberate curtailment of competitive pressures has tended to be circumvented by a modern trend to 'direct factory outlet' stores often sited in low cost locations close to good road links. The regulatory authorities have therefore extended their planning restraints to these new forms of retail outlets and opposed their development.

The locational objections to these regulatory measures are twofold. First commitments made to shield incumbent developers from competition may have entailed *quid pro quos* in terms of additional costs imposed upon the incumbent centres, such as making bus service space available and providing ramps for the disabled. They may also have involved political contributions in cash or kind. Second, there is a strong regulatory push to ensure people without car access are not 'disadvantaged' by shop locations that are not well served by public transport.

The outcome of retail competition restraints is retail prices that are higher than they should be. Some evidence of this was developed by Baker (2004) from the UrbanJHD consultancy. This reveals that Australia is under-provided with shops compared with the most liberal jurisdiction, the US. This restraint on shopping space in Australia brings higher prices. Baker (2004), for example, found occupancy costs in US regional shopping malls to average 13 per cent of sales, versus 16-17 per cent in Australia (see Table 4).

There are additional knock-on effects. The Productivity Commission (2006) recognised one such effect in its report on airport charges. Because most Australian airports were originally under Commonwealth rather than State control, they benefit from less stringent planning restraints than those on nearby land. Having been privatised, airports have moved to rent their surplus land for retail and commercial activities without requiring state government approval. New retail facilities at airports, especially in the form of 'Direct Factory Outlets', have moderated the price increases brought about by governments' restraint of competition. This also boosts the value of the airports' land and puts upward pressure on airport charges. The higher value of the land for uses other than those traditionally associated with airports will eventually lead to modifications in airport owners' business plans if higher charges associated with aircraft activities are not permitted to rise in line with the increased land value.
Table 4: Shopping Centre and Total Retail Space

<table>
<thead>
<tr>
<th>Country (year)</th>
<th>Shopping Centre (Square feet per capita)</th>
<th>Retail Space (Square feet per capita)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States (2003)</td>
<td>20.2</td>
<td>39.2</td>
</tr>
<tr>
<td>New Zealand (2000)</td>
<td>4.3</td>
<td>25.8</td>
</tr>
<tr>
<td>Australia (2003)</td>
<td>6.4</td>
<td>20.4</td>
</tr>
<tr>
<td>United Kingdom (200)</td>
<td>3.2</td>
<td>14.0</td>
</tr>
<tr>
<td>Hong Kong (2003)</td>
<td>N.A.</td>
<td>12.9</td>
</tr>
<tr>
<td>South Korea (2002)</td>
<td>N.A.</td>
<td>12.9</td>
</tr>
<tr>
<td>Singapore (2003)</td>
<td>4.3</td>
<td>10.8</td>
</tr>
<tr>
<td>Canada (2003)</td>
<td>12.8</td>
<td>N.A.</td>
</tr>
<tr>
<td>Japan (2002)</td>
<td>3.2</td>
<td>10.8</td>
</tr>
</tbody>
</table>


Effect of Land Regulation on Confidence in Political Processes

A further consequence of regulatory restraint and its political approval process is that it can lead to the abuse of government powers. Such abuse is invariably to the detriment of consumers and rate payers. Strawman (2006) highlights an alleged recent example of such abuse (see accompanying box).

The ACT government owns all land and keeps land prices artificially high by refusing to release more land. When the government does release more land, it zones it for a particular purpose - not just ‘residential’ or ‘commercial’, but it dictates the detail (for example, the type of commercial activity allowed). However, it can be quite vague about that use.

Canberra Land developer Terry Snow has his 99 year lease for Canberra Airport with the Commonwealth government, and is immune from the whims of the ACT development laws within the airport grounds.

When Snow decided to build a retail outlet on the Airport the local politicians had two internally contradictory arguments against it:

- That it couldn't possibly succeed because it was in an inappropriate place; and
- That it would be so successful that it would draw business away from other ACT retailers elsewhere.

A 7ha tract of land in the nearest industrial estate (Fyshwick) was auctioned for ‘bulky goods’. Snow was unable to clarify exactly what was meant by that. He was outbid on the land by one of his rivals, and the government has now decided that it can be used for ‘retail’. The site was independently valued at around $12 million (for bulky goods), it went for $39 million (when Snow pulled out of the bidding), and Snow says that, as a retail site, it was worth around $100 million.

The government action has brought a claimed unnecessary cost of some $60 million to the community, a cost that would be incurred either in the form of higher local taxes (comprising the rental saving of $60 million) or higher than necessary prices for the goods and services sold at retail throughout the area.
The quite massive economic rent achievable in obtaining approval to develop a piece of land puts political integrity at risk. When land can be transformed in value from a few hundred dollars per hectare to hundreds of thousands of dollars simply by obtaining a changed regulatory status, the scope for corruption is clear.

Though the ACT Auditor-General found no evidence of unfairness or preferential treatment, she did note weaknesses in coordination between two government agencies that prevented ‘efficient and effective services to the parties’. The Auditor-General’s report left many parties dissatisfied including the Shopping Centre Council of Australia.

At the very least, the rewards from changing the planning status of land justify an inordinate amount of deadweight costs in lobbying and other paper-burden activity. At worst the potential rewards from gaining regulatory favours can undermine integrity and trust in political processes when people observe favours being bought and sold for development approvals.

Duffy (2006) has put the issue with great clarity in discussing Sydney:

The relationship between this state’s developers and its government is a key element of what might be called the political business model. Developers appear to pay political donations to government to get the access they need to stay in business. According to the Greens’ website, democracy4sale.org, this makes developers the largest donor group by far after the unions. ... In practice, thanks to policies such as urban consolidation, zoning is one of the last examples of the rationing of something many people desperately want. Whenever this occurred in the past, as with bans on gambling or various forms of sexual behaviour, corruption resulted. In the 1960s people had to pay off politicians if they wanted to run a casino. Now it appears as if they have to pay political donations to build almost anything.

**Wider Macro-Economic Effects**

*Housing and real levels of savings*

The Commonwealth Treasury (2005) assembles and publishes annual data on the wealth of Australian households. Treasury notes that private wealth is important as a measure of the stock of future spending power (and therefore of real living standards) and is a major factor in future consumption levels. It argues:

The change in real net wealth of households from one period to the next is the pure economic definition of saving. Therefore, the annual change in real private sector wealth can be interpreted as the annual economic saving of the private sector.

Treasury estimates aggregate Australian private wealth in 2005 nominal dollars at $6,076 billion or $305,500 per person. In real 2003/4 dollars, as Figure 1 shows, overall wealth is estimated to have grown fourfold since 1975. In per capita terms the real growth has been two and a half fold during the same 30 year period.
Figure 1: Estimated Australian Real Aggregate Wealth

Note: a = preliminary figures
Source: Commonwealth Treasury (2005:Table A3).

Treasury’s equating of savings and the change in real wealth is misleading. As a result of housing-asset price inflation exceeding overall inflation, real wealth is overstated. Private wealth is dominated by housing which in 2005 comprised 58 per cent of the total. This has increased from 50 per cent in 1975. The next largest share, comprising one third of the total, was business assets. A proportion of these would also be represented by real estate.

The various components of private wealth (excluding foreign debt) are illustrated in Figure 2.

Figure 2: Asset Composition of Australian Households, 2005

Source: Commonwealth Treasury (2005:92, Chart 3).
Aggregate levels of wealth corrected for land inflation

If overall land and house prices based on Table 1 were deflated so that the land component increased only at the level of the CPI, this would show a more accurate picture of aggregate real wealth changes. Using such a methodology, Table 5 shows the overall increase in new house and land packages, which are closely correlated existing land and house packages. The state based price increases 1973-2006 are shown together with the price increase over and above the general level of inflation.

Table 5  Actual and Normalised New House/Land Prices

<table>
<thead>
<tr>
<th></th>
<th>1973</th>
<th>2006 with land inflation at average levels</th>
<th>Actual 2006</th>
<th>Excess inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>$28,000</td>
<td>$185,580</td>
<td>$588,850</td>
<td>2.17</td>
</tr>
<tr>
<td>Melbourne</td>
<td>$20,900</td>
<td>$155,470</td>
<td>$219,000</td>
<td>0.41</td>
</tr>
<tr>
<td>Brisbane</td>
<td>$23,000</td>
<td>$156,100</td>
<td>$247,000</td>
<td>0.58</td>
</tr>
<tr>
<td>Perth</td>
<td>$18,500</td>
<td>$149,950</td>
<td>$379,000</td>
<td>1.53</td>
</tr>
<tr>
<td>Adelaide</td>
<td>$14,000</td>
<td>$102,600</td>
<td>$230,000</td>
<td>1.24</td>
</tr>
</tbody>
</table>

Source: HIA and ABS.

In Table 6 the data from Table 5 is weighted to derive the mean of the price increases experienced in the capital cities. Over the nation as a whole, if land price inflation in the capital cities is typical the apparent worth of houses is boosted by approximately 122 per cent.

Table 6: Weighted Mean Price Increases in Capital Cities 1973-2006

<table>
<thead>
<tr>
<th></th>
<th>Sydney</th>
<th>Melbourne</th>
<th>Brisbane</th>
<th>Perth</th>
<th>Adelaide</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population share</td>
<td>0.350</td>
<td>0.280</td>
<td>0.210</td>
<td>0.085</td>
<td>0.075</td>
<td>1.00</td>
</tr>
<tr>
<td>Excess inflation</td>
<td>2.17</td>
<td>0.41</td>
<td>0.58</td>
<td>1.53</td>
<td>1.24</td>
<td>1.22</td>
</tr>
</tbody>
</table>

Some further adjustment to the data would bring it to a 1975-2005 basis. This involves taking into account the price rises 1973-1975 (when housing prices inflated by 36.5 per cent) and in 2006 (when prices increased by 7 per cent). However, in the event house price inflation in the three bookend years was not significantly from aggregate inflation levels.

Applying the 1.22 correction to the Treasury estimates shown in Figure 1 reduces the per capita value of housing wealth in 2005 from $175,036 to $79,600 when stripped of the excess inflation since 1975. (The comparable 1975 value is $44,300.)

In terms of aggregate estimated real wealth per capita, reducing the component of that identified as housing to extract the price premium created by regulatory induced scarcity from the Treasury estimate brings a decline in the real level of wealth from the stated $305,000 to something of the order of $200,000.
Land Regulations, Housing Prices and Productivity

Land price inflation and savings in OECD countries

In Germany (Demographia, 2006; Evans and Hartwich, 2005) and the many American urban areas that do not have restrictive zoning laws for developable land, house land prices have remained stable in real terms. This confirms expectations based on conventional economic analysis that zoning restrictions are responsible for an artificial land scarcity and the consequential price escalation. Inter-country comparisons offer some evidence that zoning restraints and the associated housing land inflation tend to result in a different picture of household savings ratios than that seen in Australia and other jurisdictions where zoning policy is creating land rationing and land price inflation. Hiebert (2006) looking at cross country data finds:

(In) Australia, Canada, the UK and the US ... a casual inspection suggests that the co-movement of asset price valuation and private saving has been particularly striking. ... These countries have had relatively similar experiences over time with regard to asset price developments, propensities to incur debt and access to credit. Moreover, it is likely that households in these countries have relatively similar attitudes vis-à-vis homeownership versus renting along with many similarities in pension schemes.

Hiebert cites several studies that have examined the effects of asset price inflations and savings levels. These include two that used a household wealth measure (de Serres and Pelgrin, 2003; de Mello, Kongsrud and Price, 2004) which found strong evidence of offsetting movements in private and public saving (or dissaving).

Effects on Australian savings and investment

The clear evidence that true levels of wealth, without regulatory induced land price inflation, are rather lower than indicated by official figures has major policy implications. The published estimates are likely to encourage government overconfidence about the level of aggregate household wealth, which has consequences for wealth (and income) distribution. In turn, wealth and income distribution have corollaries for the productivity of the economy.

Rationing land available for urban development purposes boosts the worth of land which has already been built upon or has been designated for such use. The value of the land allows people who have homes the comfort of an asset worth far in excess of its original cost. When considered in a nation wide perspective, the illusory nature of a large share of that apparent wealth is obvious from the fact that it is derived from a contrived, regulation-stimulated scarcity.

In the case of long-standing home owners, the wealth transfers resulting from the regulation-induced reorganisation of asset values are likely to bring an even greater misallocation than that posited for non-home owners. In Australia, around two thirds of home owners have either no mortgage or have paid off a substantial part of their mortgages. For those who have considerable equity in their own home, the escalated level of wealth they enjoy would be likely to encourage a greater level of consumption than they would otherwise regard as prudent. Thus, asset value reorganisation would be likely to induce diversion of income from
savings (and therefore from investment) as a result of the apparent high levels of wealth embodied in the stock of housing.

There is no clear evidence on the amount diverted to consumption. According to survey work undertaken by the Reserve Bank (Hampton et al., 2006), withdrawals from house equity into direct consumption comprised only 17.6 per cent of the total in 2004. A further 7.6 per cent might have indirectly been so diverted in that it comprised repayment of other debt, while some of the monies lodged as deposits (33 per cent of the total) might also have eventually been spent in areas other than asset accumulation. Only about 25 per cent (superannuation, business and investments) could be said unambiguously to be reinvestment.

Table 6 reproduces the key data assembled by the Reserve Bank.

### Table 6: Direction of Funds Withdrawn from Home Equity

<table>
<thead>
<tr>
<th></th>
<th>Non-transactors</th>
<th>Property transactors</th>
<th>All methods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Share of all households</td>
<td>Share of value withdrawn by this method</td>
<td>Share of all households</td>
</tr>
<tr>
<td>Per cent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household Expenditure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Redecoration/ durables etc</td>
<td>3.4 29.7</td>
<td>0.7 13.0</td>
<td>4.0 17.6</td>
</tr>
<tr>
<td>Car</td>
<td>1.5 13.0</td>
<td>0.3 6.9</td>
<td>1.8 8.6</td>
</tr>
<tr>
<td>Holiday</td>
<td>1.3 12.0</td>
<td>0.2 3.6</td>
<td>1.5 5.9</td>
</tr>
<tr>
<td>Living Expenses</td>
<td>0.5 2.9</td>
<td>0.2 1.3</td>
<td>0.6 1.7</td>
</tr>
<tr>
<td><strong>Asset accumulation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deposits</td>
<td>0.1 1.8</td>
<td>0.1 1.2</td>
<td>0.2 1.4</td>
</tr>
<tr>
<td>Superannuation</td>
<td>1.1 16.4</td>
<td>0.6 7.3</td>
<td>1.7 9.8</td>
</tr>
<tr>
<td>Commercial property</td>
<td>0.3 4.9</td>
<td>0.1 2.0</td>
<td>0.5 2.8</td>
</tr>
<tr>
<td>Other non-property investments</td>
<td>0.1 5.9</td>
<td>0.1 0.4</td>
<td>0.1 1.9</td>
</tr>
<tr>
<td>Repay Other Debt</td>
<td>0.5 10.2</td>
<td>0.6 18.4</td>
<td>1.2 16.1</td>
</tr>
<tr>
<td>Other</td>
<td>1.1 16.4</td>
<td>0.6 7.3</td>
<td>1.7 9.8</td>
</tr>
<tr>
<td>Cannot say</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7.3 100.0</td>
<td>4.4 100.0</td>
<td>11.7 100.0</td>
</tr>
</tbody>
</table>

Notes: Components may not sum due to rounding, and calculations involve some imputation. Also, for each household, the full value of withdrawn equity has been apportioned to the specific main use of funds.

Source: Schwartz et al. (2006).
Several studies have examined the effect of housing wealth on real levels of consumption (and hence income). Bostic, Gabriel and Painter (2006) found that a $100 increase in housing wealth brought an annual increase in consumption of $6 (that is, the elasticity of consumption spending with respect to housing wealth was 0.06).

While wealth increases are certain to bring about consumption increases (and vice-versa) dissembling such increases between their real and nominal features is essential if they are to be used in macro-economic analysis. Indeed, the selective wealth effect created by regulatory induced land price inflation is likely to bring about a changed allocation between national expenditure on consumption and investment. Those benefiting from the 'windfall', like those winning a lottery, are more likely to engage in consumption expenditures than investment expenditures.

This diversion of domestic savings from productive investment has doubtless been important in two related trends.

One of these is the increased share of foreign savings in total savings. Represented by the deficit on the current account of the balance of payments, foreign savings have grown from a previous average level of two per cent of GDP to comprise five per cent or about 20 per cent of domestic investment. Foreign lending and equity represent future claims on output. Capital inflow trends are illustrated in Figure 3.

**Figure 3: Current Account Deficit as a Share of GDP**

A diversion of savings from productive investment may also have influenced the trend in investment growth. Between 1985 and 1995 this was subdued. Investment growth was again relatively low between 1998 and 2003 but has since
increased considerably. Following an upturn in economic growth driven by the mid 1990s investment surge, privatisations, and reforms to industrial relations and competition policy from the mid 1990s, Australia's economic performance has slowed since 2003. A lift in investment since then may have provided fuel for a further growth spurt. The diversion of savings into house/land packages would clearly be influential in overall levels of investment. And although there has been an increase in investment since 2003 as Figure 3 indicated, much of this is provided by an increase in overseas savings. Figure 4 shows recent investment in plant and equipment.

Figure 4: Real Private Investment in Plant and Machinery

![Graph showing real private investment in plant and machinery from June 1985 to June 2005.](source: Australian Bureau of Statistics (2006).)

The diversion of savings into house/land packages may also be having an effect in reducing overall levels of investment. As such this is likely to have been a major cause of the productivity slowdown Australia has experienced since 2003.

Concluding Comments

Planning laws have socialised land ownership, and have transformed its value into one dominated by regulatory favours — land which is designated for urban development is increased in value tenfold and more. The value of the land on which prospective new housing development stands is dominated by government created shortage and rationing of development approvals. Regulation of land for new housing stems from many factors, perhaps the chief among which is a concern about urban sprawl. This is especially misplaced in Australia which has by far the lowest population density of any major country in the world. Regulation of land for new housing is fuelling higher prices for all similar priced homes. This is reducing the prospects of home ownership for those not presently owning their own home.

Regulation that restrains the availability of urban land also has a more pervasive effect on the economy. It diminishes the availability of savings for
productive investment, since savings are diverted to expenditures on housing the value of which is inflated by government created scarcity.

The solution is for a liberalisation of planning approvals. Initially this may have to be gradual as many individuals and businesses have taken investment positions in the context of the government created scarcity and would suffer considerable financial distress if the regulatory basis for their decisions were abruptly unwound. Beyond a transition period, the development approval process must be reversed from one that allows urban development only when the authorities permit it to one that forbids such development only in exceptional cases.

References


I would like to acknowledge the help of Mike Nahan in alerting me to some of the important material on which this report draws and to Harley Dale at the HIA Economics Group for help in assembling the Australian data.
Regulating Railways in Logistics Chains

Nick Wills-Johnson

Railways contain natural monopoly components in their track infrastructure. Hence, like most infrastructure industries in Australia, they are subject to economic regulation to prevent abuses of monopoly power. Railways also form part of logistics chains and, as such, their ability to abuse market power depends upon the characteristics of those chains. Third party access regimes presently apply to the whole network of a given railway rather than targeting routes where market power might be an issue. Access regimes also make no distinction between the types of rents earned by railways. This is important for two reasons — not all rents have the same effect on firm behaviour, and any rents available to a railway infrastructure owner are closely tied to the rents available in the logistics chain in which it forms a link. This paper seeks to expand the debate on rail access through a more detailed examination of the types of rents attributable to the different freight tasks of Australian railways and the effects these rents might have on the railways.

The following section examines some of the theory surrounding rents and the likely consequences of regulation in the presence of various types of rent. The third section examines the markets of rail’s major freight tasks to ascertain the extent of economically damaging rents in each of these logistics chains and the likely behaviour of railways in response to these rents. The paper concludes with some policy recommendations for the future of railway access in Australia, and some caveats to these policy recommendations.

Economic Rents, Regulation and Logistics Chains

Economic regulation of railways in Australia is undertaken by the Australian Competition and Consumer Commission (ACCC) and state-based regulators. Regulation is aimed at the below-rail infrastructure, not above-rail services, as the below-rail infrastructure represents a natural monopoly, while rail services are potentially contestable. Most of the regimes are similar in character, but regulatory intervention for vertically integrated railways (where track and train are owned by the same company) is more pervasive than for vertically separated railways. This reflects the diminished incentives to provide access to train operators which compete with the downstream operations of a vertically integrated track owner.

In Australia, Queensland Rail (QR) is vertically integrated in Queensland, Pacific National (PN) is vertically integrated in Victoria, Genesee and Wyoming is vertically integrated in SA and Freightlink is vertically integrated on the Tarcoola to Darwin railway. All four also operate above rail in other jurisdictions and each ring-fences its below rail operations from those above-rail, in accordance with the regulatory requirements in each jurisdiction. The iron ore railways of the Pilbara

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and the sugar railways of Queensland are vertically integrated into their respective production chains, do not interconnect into other rail systems and are not currently subject to economic regulation. The interstate track and most of the non-urban track in NSW are vertically separated and managed by the Australian Rail Track Corporation (ARTC). The Rail Infrastructure Corporation (RIC), the former manager of intra-state track in NSW, retains a small amount of track outside the coal chains of NSW. In WA, Babcock and Brown Infrastructure (BBI) has recently taken over the management of the non-urban, below-rail infrastructure, which it operates through its subsidiary, Westnet Rail.

The characteristics of logistics chains are an important part of considerations of market power and its abuse. This section presents some theory on the nature of economic rents and the effects different types of rents have on logistics chains, establishing a framework for considering, in the case of each major logistics chain served by Australian railways, whether economic regulation is appropriate. The examination of the major logistics chains is undertaken in the subsequent section.

Types of economic rents

In broad terms, there are three types of economic rents: market power rents; Schumpeterian rents; and Ricardian or resource rents. The key distinction between them is the type of behaviour they induce. Economic regulation is concerned with ensuring that economic behaviour promotes the efficient allocation of resources and hence, where a particular rent is unlikely to change economic behaviour, regulation is misplaced.

Market power rents occur when a monopolist is able to influence price. A monopolist sets output where marginal revenue equals marginal cost, and prices this output according to the demand curve. This results in higher prices and less output than the competitive outcome, where price is equal to marginal cost. It is the efficiency losses associated with this loss of output (the Harberger triangle) that concerns economic regulation, rather than the distribution of surplus between consumers and producers. In essence, economic regulators endeavour to mimic the forces of absent competition through restricting the price a monopolist can charge and thus creating an incentive to increase output.

Schumpeterian rents are rents to innovation. In form, they are the same as market power rents, but they differ in their genesis. Innovation produces temporary market power for the firm which possesses it until it is imitated by rivals and the rents are competed away. While Schumpeterian rents cause the same static efficiency issues as market-power rents, they actually improve dynamic efficiency by providing a reward for innovation and hence an incentive to undertake it. For this reason, Schumpeterian rents are encouraged through the patent system.

Ricardian or resource rents accrue to the owners of low-cost inputs that cannot be imitated, such as a mineral deposit which costs less to exploit than other deposits of the same mineral. The possessor of resource rents cannot supply the entirety of market demand from its outputs and thus customers must also source supply from higher-cost sources. These higher cost sources then become the price-makers in the market, and the possessor of the lower cost resource earns a rent. The rent is quite different from market-power rents,
because of the behaviour it induces. Since the possessor of a resource rent cannot influence price, it has no incentive to withhold supply. In fact, it has every incentive to produce as much as it can, as every additional unit produced and sold at a market price higher than the cost of production creates a windfall gain. The behaviour of the possessor of resource rents is thus indistinguishable from that of a perfectly competitive mine, and economic regulation can deliver no benefits.

Rent in a logistics chain

Freight railways seldom service final demand, but rather form a link in a logistics chain and thus face a derived demand from the next link downstream in the chain. As railway infrastructure is a natural monopoly, its owner can extract market power rents available in the consumer market(s) served by the logistics chain by virtue of the way in which it provides railway infrastructure services. The incentive to extract rents exists whether the railway is vertically integrated or not. The difference lies in the way in which rents are extracted. An unregulated vertically integrated railway will use access charges and haulage charges to extract rents (or just haulage charges if it is more profitable to avoid providing access) while a vertically separate railway can only use access charges. A vertically integrated railway might be better at extracting rents because it has operations one step closer to the final consumption market and thus is able to observe more information about demand characteristics in that market, but the rents being pursued are the same. The size of such rents is important; if available rents are small, so too are the consequences of an owner of railway infrastructure exercising its market power. In such cases, economic regulation may be unnecessarily burdensome. The type of rents is also important, and influences the behaviour of the owner of the railway infrastructure.

A railway serving a final market where there are market-power or Schumpeterian rents are present will obviously try to increase the prices under its control (either access price or haulage charges) in order to extract these rents. If it is the only monopolist in the chain, it will be able to extract all of the rents, while it will have to share the rents if other links also have market power. In some cases, even an ostensibly competitive consumer market might yield rents. If the only transport route into a market is the railway, then the owner of the railway infrastructure can act as a cartel manager, increasing the price of goods in the final market to their monopoly level and extracting all of the rents thus gained through either access or haulage charges. Where the final consumer market contains (sufficiently large) market-power rents or where a railway infrastructure owner is able to act as a cartel manager, then there is a strong rationale for economic regulation of the relevant railway infrastructure.

A more interesting case occurs where the railway infrastructure serves a market where only Ricardian or resource rents are available, say a mine. Where the marginal cost curve of the customer is smooth and rising, an increase in access or haulage charges will shift the marginal cost curve upwards and decrease the amount produced by the railway customer. In this instance, economic regulation seems justified. However, mines generally do not have smooth marginal cost curves. Rather, due to their own fixed costs, their marginal cost curves increase in steps; flat over a range of output and then increasing sharply
when new fixed costs need to be incurred in order to expand output beyond the capacity of existing infrastructure. In this case, if the marginal cost curve is vertical at the point it intersects the (horizontal — as the market will accept all output from the mine at the given price) demand curve faced by the mine, there is scope to increase access or haulage charges without a drop in mine output. Consider Figure 1. A railway, serving this mine, can increase its (access or haulage) charges such that the marginal costs of the mine rise from $MC_1$ to $MC_2$ without any effect on output or price. All that occurs is that the railway infrastructure owner obtains some of the resource rents which formerly went to the owner of the mine. However, if the railway increases charges again, so that the marginal cost curve rises to $MC_3$, not only does the railway lose revenue from the marginal units of output but, because the costs of the mine are now above the global market price, the railway loses all revenue from hauling that mine's output.

If there is one mine and one railway, and the railway knows the shape of the mine’s marginal cost curve, it has an incentive to increase the price of haulage or access up to the point where the marginal cost curve of the mine just touches its demand curve and no further. In such a scenario, economic regulation will have no effect on price in the global commodity market and no effect on the output of the mine to which the railway is providing services. All it will do is redistribute the resource rents from the railway to the mine it serves. This is not regulation, but industry policy.

**Figure 1: A Railway Price Hike with Ricardian Rents**

There are, however, few cases where a given piece of railway infrastructure serves only a single mine. In most cases, a railway might serve a number of mines which, even if they are in the same industry, might have very different marginal cost curves as each is exploiting a different resource. There are also few cases where the railway infrastructure owner knows the marginal costs of the mines it serves. In particular, the railway faces an information asymmetry in respect to its customers, exactly the same as that described by Laffont and Tirole (1993) in respect of regulators and regulated mines. Moreover, the customers have the same incentives to overstate their costs and keep more of the resource...
rents. This means that the railway infrastructure owner might find it difficult to efficiently price discriminate between its customers.

In response to different resource rents and information asymmetries, a railway infrastructure owner might decide to eschew price discrimination and set a price (for haulage or access) that recovers its fixed costs, plus as much of the total resource rents as it thinks it can obtain with a single price. Effectively, it trades off the resource rents it can capture from the larger, lower-cost customers against the losses in revenue from smaller, higher-cost customers being forced out of the market by being forced to a situation like MC3 in Figure 1. The result will be less supplied to global commodity markets and hence a fall in Australia’s export earnings.

In this instance, regulation might be able to play a role. To the extent that regulation forces the relevant railway infrastructure owner to recover only its fixed costs, rather than its fixed costs and that portion of the resource rents it thinks it can achieve in the trade-off mentioned above, it increases the likelihood that smaller, higher-cost customers of the railway will be able to stay in their relevant markets. This will increase output in these markets, but will not alter price. Thus, of the second-best options associated with a single price, the regulated price is preferable, provided of course it allows the railway to recover its cost of capital. In Australia, where revenue is capped, rather than price (meaning railway infrastructure owners are less restricted in price discrimination options), the same is true. The point remains, however, that the first-best solution to a diversity of mine costs is for the railway infrastructure owner to overcome the information asymmetries which prevent efficient price discrimination. The first-best option is not assisted by economic regulation, as an economic regulator is no more able to understand mine costs than the railway infrastructure owner.

**Market Power in Australian Railways Logistics Chains**

If economic regulation is intended to address problems associated with the exploitation of market power, then it seems sensible to examine the logistics chains of which rail is a major part in Australia to determine what kind of rents are available in them. Figure 2 shows the major logistics tasks for the Australian rail networks.

Iron ore and coal comprise almost 80 per cent of the freight task. Grain has a relatively small share, but is important because of the large network required to support it. Alumina and bauxite are not shown on Figure 2 because they are only hauled a short distance, even though their tonnages are large (more than steel, nickel and grain). Due to these large tonnages, bauxite and alumina are also examined below. Most of the non-bulk freight is intermodal freight, although a small portion of it is motor-vehicle carriage and other freight.
Figure 2: Major Rail Tasks, 2003, (billions of ntk)

Market power in iron ore

The National Competition Council (NCC) has recently considered the question of whether iron ore railways should be subject to third party access, and addressed the issue of the competitiveness of iron ore markets in their determination. It concluded that, although demand and supply imbalances resulted in buyers and sellers each having an ability to set price from time to time, overall, the market is competitive (NCC, 2005). Iron ore producers in the Pilbara are, however, very competitive on cost compared to iron ore producers elsewhere in the world. This means that Ricardian or resource rents are likely to be available to parties in the logistics chains which serve these markets. It remains to examine whether the supply chains contain a diversity of mine cost structures or information asymmetry between the railway and the mines. Both of these conditions could result in an inability to price discriminate rail infrastructure services and hence a loss of output to world markets.

In the Pilbara, along with the ports from which the ore is exported, railways are vertically integrated into the iron ore production process and each is owned by the same company which owns the mines it serves. These companies optimise over the whole logistics chain and hence, even if market-power rents were available in global iron ore markets, the railway link would not reduce services and raise price to the mines under common ownership. The railway owner, through the ownership structure, would also have access to information about mine costs such that, even if such transactions were priced, they could be priced efficiently on a mine-by-mine basis. There is no operative third party access regime on the
Pilbara iron ore railways. However, a third party (Fortescue Metals) is currently seeking declaration of these assets in order that it can obtain third party access. It is thus useful to examine the incentives of a railway owner in the position of those in the Pilbara.

To examine this issue, begin by considering the case where access imposes no costs on the railway infrastructure owner other than direct costs which can be incorporated into an access charge. Absent a mandated right of access, would the infrastructure owner provide access (or carry the third-party’s ore)? Arguably, it would. The infrastructure owner has as its main business the sale of ore into world markets. The prices it receives and the quantities it sells are not altered by the ore put into the market by the third party, so it cannot be harmed by the extra supply. In fact, since the railway infrastructure owner also has good information about mine costs, it can design access (or haulage) charges which capture all of the resource rents the third party miner might otherwise earn itself. This provides a strong incentive to provide access, since access provides the incumbent with the means to capture the resource rents of the third party without any need to risk its own capital in mining the ore.

In reality, the incumbent owners of railway infrastructure in the Pilbara have fought against third party access. Since costless access can bring them only benefits, this suggests that the provision of access to third parties is not, in fact, costless to the owners of infrastructure. The main indirect costs imposed by access is a reduction in the flexibility with which the incumbents can optimise train movements to shifts in mine output, world demand and ship arrival times. This type of flexibility is very difficult to incorporate into a contract, particularly since the access seeker and access provider are likely to want it at the same time.

If the costs of third party access are greater than the resource rents generated by the third party’s output and hence subject to capture via an access regime, it is hardly surprising that the incumbent would seek to forestall access. Moreover, this is not simply an issue just between the two parties concerned. The costs imposed on the incumbent relate to the flexibility of the logistics chain and hence on its ability to deliver ore into world markets. If a loss of flexibility reduces the amount of ore carried, regardless of whose ore it is, this has ramifications for the wider economy. The Australian Bureau of Agricultural and Resource Economics (ABARE, 2006) predicts that iron ore will be Australia’s largest export income earner in 2006-07, earning some $18 billion in export revenues. The conclusion of the NCC (2005:92) that while ‘... congestions, delays and flexibility issues may result in costs, such costs are theoretical and unforeseen at this time and therefore impossible to quantify’, thus seems a little dismissive. One potential solution may be to examine other forms of access which might impose smaller costs on the incumbents. Industry consultation suggests that one alternative currently under consideration involves access at the level of the wagon through

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1 The railways are subject to common carriage obligations under the terms of the State Agreement Regimes under which they were constructed, but no operational access regime has yet eventuated from this. They are not yet subject to access regimes under Part IIIA of the Trade Practices Act.

2 ‘Declaration’ refers to a determination by the NCC that a particular piece of infrastructure is of ‘national significance’, and should hence be subject to third party access. It is covered in Part IIIA of the Trade Practices Act 1974.
haulage services. However, the point remains that a railway infrastructure owner, which is also integrated backwards into mining operations, is more likely to be able to overcome the information asymmetries associated with an access seeker’s mining costs and thus in a better position to attain the first-best solution of efficient price discrimination. It thus seems unlikely that mandated access and economic regulation could add significantly to the efficiency of iron ore logistics chains in the Pilbara.

Market power in coal

On average, over the past eight years, Australia produced approximately 21 per cent of the world’s thermal coal exports and 52 per cent of its coking coal exports (ABARE, 2005). However, Australia accounts for only six per cent of total coal production, and domestic coal is a close substitute for imported coal — the more so when China, one of Australia’s largest customers is also the largest producer of coal in its own right and has recently begun investments which will add some 500 million tonnes (twice Australian hard coal production) to its capacity (ABARE, 2006). Both the US and South Africa are also able to act as swing producers, selling coal in export markets when prices rise. Further evidence of the competitiveness of global coal markets was seen in 2005. At the beginning of the year, the thermal coal market tightened, and spot market prices were very close to contract market prices. During the course of the year, Indonesia increased its output by almost 20 per cent, and by early 2006 spot market prices were 10 per cent lower than contract prices and contract prices paid by Japanese consumers had decreased from US$52.50 per tonne to US$41 (ABARE, 2006). This is how competitive markets operate.

It remains to examine the nature of coal production in Australia to ascertain whether there are large differences in the cost structures of mines, or whether railway infrastructure owners are likely to face information asymmetries associated with the marginal costs of the mines they serve. This can establish whether the relevant railway operates in a second-best world which might be improved by regulation. The Productivity Commission (PC, 1998) undertook a benchmarking study of some 27 Australian coal mines against their peers overseas. The study is roughly contemporaneous with the advent of access regimes in coal chains. In general, it finds that the larger Queensland mines perform better than NSW. In terms of truck and shovel operations, the study finds that Queensland mining productivity ranges from seven per cent below US best practice to 46 per cent below, while NSW mines range from 19 per cent below to 57 per cent below. In terms of dragline operations, there was a gap of 30 per cent between the best and worst performers, and in long-wall mines, the best mine was ten per cent below US best practice while the average was 25 per cent below.

The 27 mines in the Productivity Commission study represent 40 per cent of coal production. Given that around 100 mines are in operation, the sample seems likely to be biased towards larger operators and the true range of costs seems likely to be higher than the study’s findings suggest. Moreover, neither of the railways serving the coal mines is backwards integrated into mining as in iron ore. For these reasons, the policy decision to provide third party access to coal lines appears to have been the correct one, as a failure to do so may have resulted in
the closure of (or failure to open) some smaller, higher cost mines as railways pursued the Ricardian rents from the larger, lower cost ones.

**Market power in alumina and aluminium**

Thirty years ago, it might have been appropriate to consider the influence of market power in world aluminium markets, as ‘producer prices’ were set by the dominant mines in the industry. However, since 1978, aluminium has been traded on the London Metals Exchange and aluminium contracts are now predominantly based on these market-determined prices. Moreover, while Australia produces around a third of the world’s bauxite and alumina (Australian Aluminium Council, n.d.), much of this is for vertically integrated aluminium producers with global operations. Australia only produces around seven per cent of the world’s aluminium (ABARE, 2006).

It seems difficult to conclude that global aluminium markets (or, by extension, those of its precursors, bauxite and alumina) are not competitive, particularly given the market-made price. It remains to consider whether the cost structures of the bauxite mines, alumina refineries and aluminium smelters around Australia are such that there would be a risk that an incumbent railway might price access or haulage such that one was forced to leave the market or lower output. Refineries on the East Coast of Australia (Gladstone in Queensland and Gove in the Northern Territory) do not receive their inputs by rail, but by conveyor or by ship. In WA, rail is used to transport the ore to the refinery (Kwinana) or to transport alumina from the refinery to port (Worsley, Wagerup and Pinjarra). Detailed cost data for the refineries are not available. However, aside from the cost of energy, generally cost depends upon the scale and age of the refinery. Kwinana is the oldest and smallest of the four refineries, followed by Wagerup, Pinjarra and Worsley. The latter two are roughly the same scale and age. Kwinana, Wagerup and Pinjarra are owned by Alcoa, and Worsley is owned by Worsley Alumina. If all four refineries were in separate ownership, the costliest might fail as the railway attempted to extract Ricardian rents from its lower-cost competitors. However, the fact that three of the four are owned by Alcoa means that this is less likely as Alcoa has some ability to cross-subsidise between refineries in order to make them viable. Whether it would choose to do so in the longer term given global investment opportunities is, of course, another matter. For this reason, the decision to provide third party access on rail lines supporting the bauxite and alumina industries appears justified, albeit in a weaker manner than is the case for coal.

**Market power in grain**

Australia produces around 3-4 per cent of the world’s wheat, 1.25 per cent of the world’s coarse grains and less than one per cent of its oilseed (Connell et al, 2003). Around 60 per cent of Australia’s grain crop is exported, meaning Australia’s share of the global export trade in these commodities is higher than its share of production; 16 per cent of wheat, 17 per cent of barley, three per cent of coarse grains and two per cent of oilseeds (PC, 2000). However, there appears to be little evidence that these market shares impart any degree of pricing power to
Australian grain producers. The Productivity Commission (PC, 2000), examining the single desk policy for the sale of Australian grain, found no evidence that this policy affords Australian grain growers any ability to influence grain prices, even when the AWB endeavours to target certain sub-markets in grain. Grains have been traded on commodities exchanges in the US from the late 19th Century and are now traded on bourses around the world. Each of the grain types has a benchmark price against which contracts are quoted. The major influences on the supply-side of the global grain market appear to be the weather and government subsidies to grain farmers. The Productivity Commission (PC, 2005) reports subsidies to Australian wheat farmers are less than a tenth of the OECD average.

Australian grain producers and their marketing agencies appear to have little ability to influence global grain prices, meaning each Australian grain producer faces a horizontal demand curve. However, their cost functions are more likely to be curves than stepped due to the smaller fixed costs in farming. Thus a railway might be more likely to force some farms out of business as it raised access or haulage charges. There would thus appear to be a prima facie case for allowing third party access to grain lines, and indeed, once access became possible in Victoria, the first applicant was a grain handler.

There are three caveats, however, to the above statement. First, railways face competition in their grain haulage tasks from trucking. As with intermodal freight (below), if the competitive trucking industry is able to provide an effective cap to rail freight prices for grain, then regulation of railway access prices is unnecessary. Comparing freight rates for truck and rail is fraught with difficulty, because cents per net tonne kilometre (ntk) for both modes decrease as distance increases, and do so at different rates. However, Sd+D (2004) in assessing the Victorian network, suggest grain freight prices would increase 25 per cent in the absence of rail freight options. In South Australia, by contrast, the figure is only three per cent. In WA, industry sources suggest that road freight costs for grain range from 6.24 cents per ntk for distances of more than 200km to 7.49 cent per ntk for distances of less than 50km. For rail, the equivalent figures are 4.02 to 7.57 cents per ntk and are thus roughly comparable, particularly as distances decrease. In NSW, a recent study was undertaken comparing the costs of haulage on a number of marginal lines with the cost of the same haulage by road (Grain Infrastructure Advisory Committee, 2004). A plot comparing annual maintenance costs per ntk against the length of the haul is presented in Figure 3. The rail figures are indicated with black dots and the road figures with diamonds. These rail links represent perhaps a ‘worst case scenario’, as they are amongst the rail links with the highest costs relative to an equivalent road haulage task. Clearly, in this worst case, there is little point in regulating rail access charges, as rates in the road freight industry will ensure that rail cannot even recover its costs, let alone earn monopoly rents.

3 A referee suggested an industry rule of thumb in regards to the relative economies of truck vs train whereby trucks dominate for hauls of less than 300 km and rail dominates for longer hauls.
Second, railways do not really face a large group of farmers as their customers for grain haulage. The single-desk policy for grain exports and the small number of bulk grain handlers mean that there is significant monopsony power to counteract the monopoly power of the railways in each state. In such situations of bilateral monopoly, regulation is unlikely to achieve much by way of allocative efficiency (see discussion of the steel industry below).

Third, the main problem facing the grain rail network at the moment is not competition in haulage, but the viability of many grain rail links. The grain networks were constructed more than a century ago and many links have seen little or no maintenance expenditure in decades. Arguably, it seems a little odd for policymakers to concern themselves with a potential monopoly rent which arises from an asset base which is itself close to failure, as the rent may disappear along with the railways unless some other solution to improve the viability of the networks is found. Thus, while third party access to some grain links may be appropriate in principle, arguably the more important focus of policymakers in relation to the grain networks are their viability, not the potential for competition upon them.

Market power in steel

Steel hauled on railways is not, in general, for the export market, but rather for domestic consumption. It is used in such a wide variety of markets that it is impossible to generalise as to market structure in end markets. But at least some major end markets, such as construction, are highly oligopolistic and hence there would appear to be market-power rents available in these chains, providing
potential for rent extraction by the railway carrying the steel. This would seem to indicate a prima-facie case for third party access and regulation.

However, there are only three steel producers in Australia who use rail haulage; Bluescope Steel in Newcastle, Smorgon Steel in Victoria and One Steel in Whyalla. All use the one railway (PN) to carry steel feedstock and intermediate products on the rail network, but each operates in different states and each moves a different range of products. The extent to which PN can play one steel producer off against another to capture rents thus seems limited. PN is also tied to steel haulage to a certain degree, because efficient haulage of steel requires specialist wagons which cannot be used for any other purpose, giving the steel-makers additional bargaining power in negotiations. It seems more likely that a bilateral monopoly exists. There is nothing intrinsic about a bilateral monopoly bargaining situation which provides an advantage to one side over another; advantage rather depends upon the negotiating skills of each of the parties in the negotiation. More importantly, from a public policy perspective, if the problem is monopoly rents in the logistics chain which delivers steel to final markets, then addressing one link in the chain in isolation will not lower rents, but will simply transfer them to other links in the logistics chain. Indeed, a third party access regime in networks serving steel markets would be to the distinct advantage to the steel producers. Regulatory policy would thus become a de-facto industry policy, favouring steel producers over railways. There thus does not appear to be any overwhelming public policy case to be made that third party access on steel networks would lead to significant welfare improvement.

Market power in intermodal freight

Intermodal freight, like steel, serves domestic markets and faces downward-sloping demand curves. As such, it would seem there is a prima facie case for third party access to rail links serving the intermodal freight market. There is, however, a caveat to this statement. Like grain, intermodal freight railways face competition from trucks, which also carry the same freight. In fact, in general, the prices for haulage are set by trucking and followed by the railways. If it is the case that the cost differentials between the two modes is very small, then arguably, the competitive trucking industry could be equally, if not more, effective than regulation in ensuring that railway track owners do not exercise their market power.

The ACCC (2001) assessing the Australian Rail Track Corporation (ARTC) network notes that the ARTC’s returns appear lower than the full economic costs of its capital. It further notes that, while the ARTC is intending to move towards a position of full cost recovery, the ACCC does not believe this will be achieved during the course of the life of the first access agreement. Indeed, the ACCC seems more concerned about dynamic inefficiencies resulting from the ARTC being unable to earn rates of return sufficient to fund investment into the longer term than it is about abuses of market power in the short term.

The ACCC also believes that a substantial portion of ARTC’s business is highly elastic, due to the existence of a competing road sector. For this reason, the ACCC suggests that the ARTC would be unlikely to be able to increase access prices or reduce service levels compared to those extant at the time of its draft
decision (*ibid*). The ACCC goes on to say that this provides a strong incentive for the ARTC to negotiate access prices which ensure that freight will be carried by rail, and that it disagrees with suggestions that the company will ignore the effects of its pricing on competition. From these comments, it seems unlikely that the ARTC is extracting significant monopoly rents. This, however, may be because of decisions that ARTC have made in relation to how it structures its access charges, and regulation is predicated on the fact that rents can be earned by a monopolist, not that they are being earned at present. It is thus useful to ascertain the extent of rents which might be available by comparing rail costs with the charges of rail’s closest substitute — road transport.

The Australasian Railway Association (ARA, 2005) has undertaken an exhaustive study of road and rail freight costs. The ARA is a lobbying agency and the report was produced to advocate more cost recovery from trucking, which means that the costs of rail may be overstated and those of trucks understated. However, the report rigorously documents its sources and uses the assumptions of independent agencies where possible. As such, distortions do not seem to be too egregious. A simple comparison of costs between road and rail from the document is reproduced below, in Table 1. For rail, the costs cited include door-to-door delivery costs at each end of the line haul.

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Road (c/ntk)</th>
<th>Rail (c/ntk)</th>
<th>RIC-Efficient Rail (c/ntk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney-Brisbane</td>
<td>6.4</td>
<td>6.6</td>
<td>4.3</td>
</tr>
<tr>
<td>Melbourne-Sydney</td>
<td>6.0</td>
<td>6.9</td>
<td>5.5</td>
</tr>
<tr>
<td>Melbourne-Brisbane</td>
<td>5.8</td>
<td>5.9</td>
<td>3.8</td>
</tr>
<tr>
<td>Melbourne-Adelaide</td>
<td>6.6</td>
<td>3.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Adelaide-Perth</td>
<td>6.3</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Melbourne-Perth</td>
<td>6.1</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Sydney-Perth</td>
<td>5.7</td>
<td>3.5</td>
<td>2.5</td>
</tr>
</tbody>
</table>


Two sets of figures are presented for rail, to take into account the costs which would eventuate if perceived inefficiencies in NSW’s rail network (managed by the Rail Infrastructure Corporation at the time of the report) were addressed. Figure 4 compares road and rail freight rates over the past few decades.
In 2000-01, average road freight rates were 5.66 cents per net tonne kilometre (c/ntk) while average rail freight rates were 2.75 c/ntk. Converting the figures from Table 1 to 2000-01 dollars for the case where no improvements are made to the RIC network, the routes which had rail costs lower than 5.66 c/ntk are Melbourne-Brisbane (5.31 c/ntk), Melbourne-Adelaide (3.42 c/ntk), Adelaide-Perth (2.34 c/ntk), Melbourne-Perth (2.52 c/ntk) and Sydney-Perth (3.15c/ntk). The difference between each of these figures and the road-haulage charge (5.66 c/ntk), multiplied by actual haulage, provides a rough estimate of the total potential rents. Table 2 shows that rail lags road on a number of service quality variables, a fact reiterated by a recent survey of manufacturing customers (Department of Transport and Regional Services, 2006).

Table 2: Road and Rail Service Characteristics

<table>
<thead>
<tr>
<th>Route</th>
<th>Transit Time (hrs)</th>
<th>Reliability* (%)</th>
<th>Availability** (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Road (hrs)</td>
<td>Rail (hrs)</td>
<td>Road (%)</td>
</tr>
<tr>
<td>Sydney-Brisbane</td>
<td>15</td>
<td>21</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>Melbourne-Sydney</td>
<td>11</td>
<td>13.5</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>Melbourne-Brisbane</td>
<td>33</td>
<td>36</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>Melbourne-Adelaide</td>
<td>9</td>
<td>13</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>Melbourne-Perth</td>
<td>43</td>
<td>58</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>Sydney-Perth</td>
<td>55</td>
<td>72</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99</td>
</tr>
</tbody>
</table>

Notes:
* reliability defined as percentage of services arriving within 15 minutes of scheduled time
** availability defined as the extent to which each mode provides services at the times the market demands.

Thus it seems unlikely that a railway would be able to charge 5.66 c/ntk (inclusive of access line-haul and delivery charges), meaning rents calculated by the rough approach outlined above are likely to overstate true available rents. It also seems unlikely that road charges are 5.66c/ntk on all routes. Rather, since road transport is also subject to diminishing unit costs as distance increases (see discussion on grain haulage), it seems likely that road-freight rates would be lower on longer routes. This would also reduce the size of available rents which might be captured by railway infrastructure owners. Finally, these rough calculations contain an implicit assumption of inelastic demand for rail freight and tonnages may in fact decrease in response to an increase in rail freight charges.

All of these caveats aside, it is useful to examine where the upper bounds might lie. Figure 4 provides this estimate, with total rents shown as a bar chart using the left-hand axis and rents per ntk shown as a line using the right axis. Haulage figures are for inter-capital city, non-bulk freight, and are derived from BTRE (2006) and Australian Bureau of Statistics (ABS, 2002). Bulk freight is not included as most of this is for export markets with limited market-power rents. Figure 4 does not include rents for Melbourne-Sydney or Sydney-Brisbane, as both of these routes have costs greater than the average charges of trucks.

**Figure 4  Upper Bounds on Potential Rents in Australia Railways**

The potential rents on the Melbourne-Brisbane and Melbourne-Adelaide routes are very small. Since these are upper bounds, actual rents may not even be positive. For routes to Perth, however, the upper bounds of potential rents are much higher and it seems much less likely that trucks can effectively constrain rail rates, and by extension, rail access charges. Thus, for intermodal freight, regulated access seems most appropriate on the East-West links, and of limited relevance elsewhere on the network, where competition from trucking is likely to constrain pricing and deliver efficient resource allocation without any regulatory action.

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4 BTRE (2006) provides figures from the Eastern States to Perth, but not city-by-city. ABS (2002) provides city-by-city results, but for total rail freight, not just non-bulk freight. Thus the proportion of each city pair on the East-West route from the ABS data was applied to total figures from BTRE (2006).
Conclusions and Policy Recommendations

Mandatory third party access to rail infrastructure and economic regulation currently covers all of the interconnected rail system in Australia. This paper questions such an approach, suggesting that not all rents are equal in terms of their effects on economic behaviour and not all are sufficiently large to warrant regulation. It suggests that in most cases, the rents being earned are Ricardian rents, which do not alter behaviour from that which would prevail under competition. Situations where market-power rents could be earned and are of sufficient size to warrant regulation appear limited, essentially to the East-West links managed by the ARTC. From this finding, the logical policy prescription is to treat market power in railways as the exception, rather than the rule.

This policy prescription is similar to that of the Productivity Commission (2006) in its recent report on road and rail pricing in Australia, and it would result in declaration being removed from many railways around Australia. The paper also suggests a stronger focus on the characteristics of the markets associated with the major freight tasks of Australian railways, rather than just focussing on the rail link itself.

While the paper suggests some substantial changes to access regimes, the policy recommendations made above are subject to some caveats and the recommendations are intended to stimulate, rather than end debate. The caveats are as follows:

- The desktop examination of the industries' rail serves conducted here was cursory. A more rigorous analysis is needed before significant policy changes are contemplated.
- Arguments presented here relate to static efficiency, which is what the neoclassical frameworks of regulation is designed to maximise. The distributional effects of railways capturing more of the Ricardian rents in export logistics chains could have some important dynamic efficiency ramifications which are not captured here. For example, if railways capture most of the Ricardian rents in an alumina chain, the alumina producers would have few incentives to expand output. New entrants to the industry may also be deterred. By the same token, if third party access results in railways not being able to capture any of the Ricardian rents in minerals export chains, then this may dissuade expansion by existing railway operators of their capacity, and act as a deterrent to future investment by new entrants in the rail industry. A balance is required, but this balance is arguably best served by industry policy, not economic regulation.
- No comment has been made here about the technical efficiency of the existing railway compared to a potential entrant. It could be, for example, that the incumbent is not particularly technically efficient and the marginal cost curve for the whole logistics chain could be shifted downwards if the incumbent could be moved out and another monopolist take its place. For example, the Productivity Commission (1998) investigating the black coal industry in NSW and Queensland at the outset of the recent decade of reforms in rail, suggested that the productivity of Australian coal rail operations was some 20 per cent below that of better overseas operations. A third party access regime may have assisted improving productivity in these coal chains by providing a strong incentive for productivity improvement through the pressures of contestability. However, if a railway is earning monopoly rents, then economic regulation will reduce prices, and hence the returns which might otherwise induce
entry. Again, the promotion of technological progress is better addressed through industry policy, not regulation.

- Rail carries many types of freight, and logistics chains are often interlinked. It is difficult, in reality, to talk about ‘the steel chain’ or ‘the intermodal network’ because trains serving both markets often utilise the same tracks. Practical implementation of the findings of this paper would generally involve making determinations on access based on the majority of freight on a given route, or on the costs if access is not provided for a freight task where it is needed compared to the costs imposed on a freight task where it is not. These determinations will necessarily require judgement, but the fact that they are difficult does not mean that the current blanket coverage is the optimal response.

References


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Inclining Block Tariffs for Urban Water

Lin Crase, Sue O’Keefe and Jennifer Burston

Urban water pricing and the water-using behaviour of households continues to attract the attention of policy makers and scholars. Arguably, the strong focus on urban water belies the fact that almost three quarters of consumptive water use in Australia occurs in agricultural settings (ABS, 2004). Nevertheless, the political import of urban water prices, accompanied by concerns about anthropogenic climate change, rapidly diminishing water supplies and a vigorous reform agenda have made for a volatile policy-making environment. Against this background there is potential for agencies and regulators to become distracted from their primary responsibilities and allow emotional arguments to hold sway over rationality.

To date, one of the less contentious issues has been the widespread implementation of inclining block tariffs (IBTs) and their acceptance as an appropriate charging methodology. An IBT embodies an increase in the volumetric or per unit charge once a predetermined threshold of consumption is exceeded. Put simply, the first ‘block’ of water is sold at a low rate and as consumption moves into higher blocks the marginal water usage charge increases.

Boland and Whittington (2000) have argued that there are three main tasks to be accomplished in designing an IBT: deciding the number of blocks in the structure; assigning a volume of water to each block (that is, X kℓ in Figure 1); and establishing a price to be charged for each of the blocks (that is, $y and $z in Figure 1). Rogers, de Silva and Bhatia (2002:7) contend that the first of these is essentially a management decision, while the second and third are ‘political and social decisions’. In the light of the grounds used by the Victorian Essential Services Commission (ESC) to reject the introduction of some IBTs (see below), this raises serious questions about the role of economic regulation in this context. It also highlights other concerns about the economic merits of IBTs (see, for instance, Wittington, 2003; Sibly, 2006) and points to the need for closer scrutiny of their efficacy. Two pertinent questions arise: First, what are the features of an IBT that would lead an economic regulator to make decisions which are ostensibly in the political and social domains? Second, what types of information would be required to enhance decisions about the structure of IBTs, and is it feasible for this information to address the efficiency limitations embedded in IBTs?

In this paper we attempt to shed light on these questions by exploring the economic merits and limitations of IBTs. The paper specifically considers the notion of ‘discretionary water use’ and provides insights into its measurement dynamics in the context of rural and regional Victoria.

The paper is organised into six main parts. The following section briefly summarises the relative economic merits of IBTs. The next section addresses the
notion of 'discretionary water use' and proposes a method for enumerating this thorny concept in different settings. An overview of empirical data collected from a survey of households in North East Victoria is then provided. The survey sought to identify the water volumes at which a two-step IBT might 'target' discretionary water use. Alternative approaches to interpreting these data and an assessment of the implications for different consumers are provided in the penultimate section. The final section examines the merits of attempting to describe 'discretionary water use', before offering some brief concluding remarks.

The Deployment, Merits and Limitations of IBTs

A diagrammatic representation of an IBT comprising two tariff blocks appears in Figure 1.

Figure 1: A Two-Part (Step) IBT

IBTs are currently applied in all major Australian cities except Newcastle, the Gold Coast and Darwin. The structure of IBTs used varies markedly. For instance, residents of Sydney and Adelaide face a two-block tariff (similar to that depicted in Figure 1), there are three blocks applied in Melbourne and Brisbane while five apply in Perth. The prices applied to each block also differ considerably, with block one charges being much higher in Sydney, Brisbane and Melbourne than in Perth, Adelaide and Canberra (Edwards, 2007).

In addition to variations between states there are significant discrepancies within jurisdictions. For example, in Victoria all metropolitan water utilities apply IBTs while many regional water authorities do not. Interestingly, the economic regulator in Victoria, the ESC, chose to reject the application of some regional water authorities to introduce IBTs on the basis that the proposed structures did not adequately target the discretionary component of household water use (ESC, 2005). In essence, the ESC argued that the threshold of the first tariff block (X kl in Figure 1) was too high, although no alternative method of establishing an efficient threshold was provided.

Setting prices, particularly for water is rarely a simple task. Conventional economic wisdom suggests that prices need only be equated with marginal cost to
generate efficiency. However, urban water pricing is confounded by several factors. First, water and wastewater services are generally regarded as natural monopolies and governments have long taken seriously their role to influence and regulate the behaviour of utilities of this kind. Second, there are political and environmental dimensions to the price of water and wastewater services that do not attend other monopoly suppliers. Claims of improved public health and sanitation, for instance, can impact on the 'acceptable' price for water. Third, there are philosophical objections expressed by some about charging a price for 'water for life'. This often gives rise to concerns about the equity of water pricing, although this is seldom defined with precision. Fourth, the technical operation of water utilities also complicates price setting because recouping only short-run marginal cost can potentially threaten the financial viability of the utility.

To better understand the merits of a water tariff structure it is important to acknowledge the objectives that underlie its design. Following Whittington (2003) and Boland and Whittington (2000) several fundamental objectives may be identified. First, a tariff needs to generate sufficient revenue to recover costs. These include the operation and maintenance costs, but the revenue stream must also be adequate to attract equity and debt financing. Revenue stability is another dimension of the revenue sufficiency objective although revenue stability *per se* cannot be justified on economic grounds alone. Second, tariffs need to be economically efficient — 'prices should signal to consumers the financial and other costs that their decisions to use water impose on the rest of society' (Whittington, 2003:63). Third, a tariff structure seeks to be equitable. Equity implies that 'similar customers are treated equally, and customers in different situations are not treated the same' (Whittington, 2003:63). Finally, a poverty alleviation objective is often assigned to water tariffs on the basis that water services are a fundamental right and the poor should at least have a minimum quantity of 'water for life'. The corollary of this argument is that water tariffs should also be used to curb excessive, wasteful or profligate water use. Unfortunately, the distinction between 'wasteful' water use and 'water for life' is contested.

The extent to which IBTs are able to deliver on each of these objectives is questionable. Cost recovery can be achieved with other pricing structures, such as a single volumetric charge set at long-run marginal cost. Clearly, this would expose the water utility to greater revenue fluctuations, although this is not strictly an economic consideration and can be accommodated by the imposition of access charges. In addition to providing revenue stability, access charges assist in the recovery of sunk costs but their relative size and basis are problematic. Currently, Victorian water authorities set a standard access charge for all properties connected to the water network, although Dwyer (2006:5) observes that a more efficient approach entails recovering the fixed component on the basis of land values (as is applied for wastewater services in South Australia. A variant of this technique is being progressively phased out in Western Australia).

IBTs fail on the economic efficiency front for several reasons. Setting multiple prices is inconsistent with the notion that customers should face the incremental costs of their actions, unless the service provided is attended by different costs. In essence, it is difficult to see how the cost of supplying a small number of households who use a larger quantity of water is higher than supplying
small quantities of water to more numerous households. And yet an IBT gives rise to prices that suggest this is the case. The scale economies of tariff collection and the dynamics of water delivery would *inter alia* suggest that larger water users should face lower costs rather than higher costs. In addition, there are potential scale economies that attend consumption; larger households may frequently use less water per capita than smaller households (Dwyer, 2006:11).

The equity objectives of water tariffs are also not well served by IBTs. Recall that equity in this case means treating customers in similar circumstances equally and those in different circumstances differently. If ‘the circumstances’ in question are financial, there is no guarantee that water usage will be perfectly correlated with income. While there is some evidence of higher water use in richer households (see, for instance, DHS, 2004), many violations of this objective are also likely to arise from the imposition of IBTs. A high income apartment dweller could easily face much lower marginal tariffs than a large, low income household.

Finally, the notion that IBTs are consistent with the ‘water for life’ hypothesis would only hold if the first block was priced at below cost, or even assigned a zero price. It is worth considering the rationale that would support a free ‘water for life’ component embedded within water tariffs. Interestingly, food is equally necessary for sustenance and fundamental well-being (Edwards, 2007), but there is no call upon sandwich vendors or supermarkets to provide a minimum quantity of their produce to sustain all human life. This does not occur because it would seriously distort the incentives offered to food producers and be tantamount to taxing all food consumption above subsistence. Rather than taxing food alone, governments have found more effective means of providing subsistence to the poor; food stamps being a case in point. A similar argument could be mounted in favour of demogrants or water credits based on the number of residents in a household in preference to an IBT where the price of the first block would have to be set well below cost to achieve its purported poverty-alleviation objective.

**Using Consumer Data to Define Discretionary Water Use**

A related and practical challenge is distinguishing that component of water consumption which is genuinely discretionary. If IBTs are truly designed to target discretionary water use, which can be willingly curtailed in response to the higher price signal, it would be necessary to establish the step in the IBT at a level which reflects the bifurcation between discretionary and non-discretionary activities.

Basic water needs in developing countries have been estimated to lie in the range of 25-30 litres per capita per day (WHO, 1997; UN, 1993). This equates to about 9-11 kilolitres per annum or around 50 kilolitres for a 5 person household. If we accept that the genuine basic subsistence needs are universal, this stands in stark contrast to the various steps in IBTs applied in Australia’s cities. For instance, in Canberra the first block expires at 100 kilolitres per annum while in Melbourne consumption up to 440 kilolitres per year is considered ‘non-discretionary’. In Sydney 400 kilolitres comprises the first block of the IBT while the threshold in Perth occurs at 150 kilolitres. Not only are these volumes grossly in excess of the reported volumes of water that would constitute truly non-discretionary water consumption, their variation reflects the arbitrary manner in which this term has been interpreted by different economic regulators.
Notwithstanding the shaky theoretical foundation of IBTs, they remain the

tariff structure of choice amongst most water utilities and regulators in Australia.

However, as we have noted, they are plagued by practical complexities which

have not been consistently handled or resolved. One of the major challenges has

been identifying a meaningful metric for discretionary water use which might be

acceptable to water consumers. For instance, it might be argued that variations

in the threshold level that applies to the first step in an IBT reflect geographical
differences and the amounts of water required to deliver an equivalent quality of
life in those settings. A household in an arid city might require more 'non-
discretionary' water than one located in a more temperate region. In reality, the
differences in climate between Australian cities are not so great as to provide a
satisfactory explanation for the variations in tariff structures that have emerged.

The arbitrary assignment of the volume in the first step in an IBT (that is, $X$
kl in Figure 1) is a non-trivial matter. Set too high, it would seriously erode
claims by proponents of IBTs that the tariff structure signals the necessity for 'wise'
use of water. Set too low, it would considerably punish non-discretionary water use.

Moreover, given the overarching role of economic regulators to ensure that water
utilities do not extract excessive rents from their customers, an inappropriate
threshold volume can result in utilities enjoying excess profits (or losses).

A possible way to avoid arbitrary assignment of threshold volumes is to use
consumer data about the distinction between discretionary and non-discretionary
water-using activities. This might address some of the efficiency losses arising
from an inappropriately defined threshold. By providing consumers the
opportunity to identify those water-consuming tasks that they would be willing or
able to curtail, and then distinguishing these activities from those conceived to be
essential, it becomes feasible to set threshold limits that might at least
approximate the preferences of consumers, rather than those of the regulator.

An Empirical Investigation of Discretionary Water Use

Given the practical difficulties of identifying the distinction between 'discretionary'
and 'non-discretionary' water-use by employing secondary data, a survey of water
users was conducted to gain insights into their preferences in this setting. The
survey was conducted in North East Victoria, in the region where the ESC had
formerly rejected the introduction of IBTs on the grounds that the water utility
had not appropriately targeted 'non-discretionary' water use. The survey was
accompanied by additional data gathering activities dealing with the consumers'
preferences for tariff structures and feedback on other urban water policies.

Preceding the survey, a series of focus interviews and focus groups were
conducted in both small and large towns across the region. Participants covered a
range of ages and interests and were selected from different employment and
social groups in the area. There is some climatic variability across the region and
an effort was made to sample from residents in the different climate zones.
Initially, the focus interviews used an open-ended format which endeavoured to
elicit participants' description of their water-using habits, followed by a discussion
centring on how much knowledge they had of each activity. The focus groups
were then used to encourage participants to generate a ranking system by which
water use activities could be categorised. These sessions revealed the difficulty of
employing a simple bifurcation between 'discretionary' and 'non-discretionary' water-using activities. Most participants argued that there were many activities which should be permissible but the user should be constrained in some way. In addition, many participants indicated that they knew relatively little of the volumes of water that were associated with different household tasks and they felt this would have a bearing on their decisions. By and large there was consensus that outdoor activities contributed significantly to water consumption.

Information gathered from focus groups was used to design a survey instrument listing a range of household activities and asking respondents to categorise each into one of three groups, namely, activities that should not be restricted; actions that should be permissible with some restrictions on use; and behaviour that should be highly restricted or banned. Importantly, the second category listed examples of constraints that might be applied. More specifically, these were described as activities for which households should pay more for the privilege of undertaking them. The description of each of these categories was tested and refined with a pilot survey of 30 households. The list of activities presented to respondents was a composite of household tasks taken from various sources and web-based water-use calculators (for example, WSAA; South East Water; City of Melbourne). It included kitchen uses (like sinks and dishwashers), laundry appliances (water-efficient and less water-efficient washing machines), different types of showers and toilets and a range of outdoor activities.

An information booklet was designed and included with the survey instrument. The information booklet listed the typical water consumption that applied to each activity. This was calculated on a quarterly basis, with the exception of garden watering, lawn watering and topping up swimming pools, which was calculated seasonally. To make the task manageable, each activity was constrained by assumptions. For instance, the volume of water associated with AAA shower roses was limited to a household of 3 people who showered once per day for 5 minutes. The purpose of these descriptions was to give respondents some broad understanding of the water usage that related to each activity so that they would have some basis upon which to consider their merits.

The survey was distributed to a stratified sample of customers of the North East Regional Water Authority. The sample was stratified insofar as customers of the authority faced two different billing systems (for wastewater services) and the sample represented the roughly even split of customers across different tariffs. In September/October 2006, a total of 800 mail surveys were distributed to customers on one tariff structure while 886 surveys were sent to the other stratum. A reminder and thank you letter were sent 10 days after the initial mail out. The total response rate after two weeks was 20.05 per cent, with the split between the two sub samples roughly equal (52 per cent and 48 per cent). A summary of the characteristics of the ‘average’ respondent appears in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Characteristics of Average Survey Respondent</th>
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<tbody>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>-------------</td>
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<tr>
<td>48.4</td>
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Ascertainment of the Volumetric Step of an IBT with Consumer Input

Initially, respondents were provided with a simple explanation of IBTs and asked a dichotomous choice question as to whether they would be in favour of their introduction. About 79 per cent of respondents supported the use of IBTs when they were described as 'supplying a reasonable amount of water at a lower rate but charging a higher rate once this level of consumption was exceeded'. No effort was made to define 'reasonable amount' at this point of the survey. Scrutiny of these data showed no significant relationship between support (or otherwise) for an IBT and age, household size, household income, the size of the last water bill or the consumer's ranking of their knowledge. However, those in support of an IBT were more inclined to rate a larger number of water using activities as 'discretionary' compared to those opposed to the introduction of IBTs.

The task of classifying each water-using activity followed this initial question about IBTs. Activities could be classified into one of three groups (unrestricted, permissible at a price and heavily restricted) and count data for each of the activities has been assembled. Perhaps not surprisingly, the distribution largely reflected the water by-laws and water restrictions that have been in place throughout much of Victoria for some time. For instance, many fundamental indoor uses were skewed towards category one (unrestricted use) while outdoor activities broadly fell into the second and third categories (permissible with price penalties or banned). Similarly, some outdoor activities were seen as more discretionary than others; watering lawns was more skewed towards the 'heavily restricted' category than garden watering. A sample of the count data is provided in Figure 2 to illustrate the distribution of some activities.

**Figure 2: Sample Count Data of Ranking of Water-use Activities**

![Count Data of Ranking of Water-use Activities](image-url)
One way of categorising this information is to transform the data into universal measures of 'discretionary' versus 'non-discretionary' water use. For instance, by assigning each category a value (1 = not restricted; 2 = permissible but facing some constraints (that is, a higher price); 3 = heavily restricted) it then becomes feasible to adjudge the various water-using activities along the 'discretionary' continuum. For simplicity this has been undertaken initially using mean values and a 95 per cent confidence interval which appear in Figure 3, while a ranking of the mean score of each activity appears in Figure 4.

**Figure 3: Mean Values and 95 per cent Confidence Interval for Water-using Activities**

To transform these rankings into a volumetric measure that distinguished the threshold or step in the IBT, the water use attracted by each activity (as described to the respondents) was then apportioned to those activities regarded as non-discretionary. However, this was complicated by two matters.

First, a choice needed to be made about the appropriate statistical treatment of the count data. Figure 4 has ranked each activity on the basis of their mean scores but it is also feasible to use the mode or median to generate similar rankings. Prima facie, this might seem to make little difference but, as we will see, variations can arise from this relatively simple decision. Second, an appropriate cut-off needed to be ascribed on the scale of activities. The structure of the data collected in this case makes this task less onerous. More specifically, since categories 2 and 3 were described as 'permissible with restrictions' (that is, paying a higher price) and 'heavily restricted' respectively, it has been assumed that any activity falling into these categories constitutes discretionary water use.
Mean, median and mode values for each activity were calculated and then each was assigned to discretionary or non-discretionary groupings. Subsequently, those activities classified as non-discretionary were allocated their notional water use, in line with the information provided to respondents. For example, using the kitchen sink generated a mean score of about 1.2 and was thus considered non-discretionary. The quantum of water that attends this activity was 12 kl/year and, accordingly, this quantum was assumed to lie in the first block of the IBT. This process continued for all activities and the total volume of water summed to give the non-discretionary threshold. Results are summarised in Table 2.

Table 2: Estimates of Annual Non-discretionary Volume-using Mean, Median and Mode Values Assigned to Activities

<table>
<thead>
<tr>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>161 kl</td>
<td>169 kl</td>
<td>188 kl</td>
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The variation in estimates occurs because more activities lie above the cut-off value when the mode and median are used to generate results compared to the mean. For instance, in Figure 2 the count data for the use of a laundry trough was provided. The mean score generated from these data was higher than that of the mode and median score — so much so that it results in this activity being classified as discretionary in one case (the mean) and non-discretionary under the mode and median estimates.
Policy Implications and Impacts on Customers

Several important observations can be drawn from these data. Perhaps most striking is the relatively low threshold volume which represents the first step in any IBT that would genuinely seek to distinguish discretionary water use in the study area. Moreover, the volume generated by this process falls well short of that used in the IBTs applied in Melbourne and other parts of Victoria (commonly around 400 kl per year). This discrepancy can be attributed to several factors. First, the relatively arbitrary nature of past decisions by regulators could account for the discrepancy. Put simply, regulators who have made choices based on discretionary and non-discretionary water-use distinctions elsewhere may have given only limited consideration to the water-using activities and their cognition by consumers. To the knowledge of the authors no regulatory agency in Australia has yet developed and prescribed a method for adjudging the volumes that should be attributed to different blocks in an IBT.

Second, consumers in different regions of Victoria could have vastly different interpretations of the status of water-related activities. Arguably, those located in rural and regional Australia may view water scarcity differently and be willing to forego more activities than their metropolitan cousins. Given the size of the discrepancy revealed by these data, this seems likely to account for only part of the divergence, at best. Adjusting these data to classify only those activities lying in the upper band as discretionary (that is, including only those ranked as heavily restricted or banned) would be one way of addressing this discrepancy. However, doing so would belie the information provided to respondents and the message embedded in the data themselves. Excessive manipulation of these data also runs the risk of imposing the same forms of arbitrary decisions that appear to have accompanied earlier IBT designs.

Third, the list of activities used in assembling these data might be regarded as incomplete and inconsistent. For instance, respondents to the survey were asked to categorise both dual flush and standard toilets, and front-loading and top-loading washing machines. These requests might be considered implausible since few households might be expected to have both types of appliances. However, the purpose of the ranking exercise was to have consumers assign their values to water-using activities and thereby differentiate between those perceived to be acceptable and essential from those perceived to be luxurious and warranting a penalty. Consequently, including a range of appliances is consistent with this approach and, in any case, is likely to inflate the estimate of non-discretionary water use. Accordingly, this fails to adequately explain the variation between the estimates generated by these processes and those determined by the ESC.

Fourth, the discrepancies between the volumetric step assigned in Melbourne and that suggested here could be accounted for by the current political sensitivity of urban water pricing and concerns about the fairness of an IBT with a very low volume assigned to the lowest block. We have already noted that decisions about the size of each block tend to be made on political grounds. Moreover, it was the decision of economic regulators to engage in this field which prompted some of this inquiry. However, assigning a high volume to the block-one tariff to gain
political acceptability would appear to be at odds with the justification offered for
the introduction of IBTs in the first instance — namely, that they discourage and
punish those who use water 'wastefully'. If discretionary water use actually
commences at a much lower volume than 400 kl per year, as suggested by these
data, the structure of existing IBTs should be significantly modified to meet with
this objective.

From the perspective of customers, if the water utility was to implement an
IBT based on these data it would result in only a modest volume being available
at the lowest marginal rate. Currently, the average household in the study area
consumes about 350 kl of water per year, well in excess of the thresholds
generated by this study. Moreover, setting the threshold volume at the point
suggested by these data would potentially add considerable complexity to water
tariffs. A household endeavouring to determine the consequences of a change in
water consumption is already confronted with non-trivial technical and practical
challenges. Where the tariff structure embodies an IBT, an estimate is required to
adjudge whether the proposed consumption is likely to be above or below the IBT
threshold. The difficulty of this task is exaggerated by the retrospective nature of
billing systems and metering devices which are often not easily accessible.
Moreover, by positioning the IBT 'step' at roughly half of average consumption a
large number of water users will be faced with this dilemma. Put simply, most
urban water tariffs are already sufficiently complex to weaken price signals and
adding an IBT 'step' at of this type seems unlikely to make this signal any clearer.

Concluding Remarks

IBTs have been widely applied by Australian urban water authorities and accepted
by economic regulators as an appropriate tariff structure. Amongst their
purported strengths is the capacity to design the blocks to target and discourage
'wasteful' water use by households. However, there is considerable inconsistency
in tariff design across and within jurisdictions, suggesting that some states are
more 'wasteful' than others or that the distinction between non-discretionary and
discretionary water use has been arbitrary.

In an effort to provide a more robust mechanism for assigning the threshold
volume to the first block of an IBT, primary data was collected from urban water
consumers in North East Victoria. These data provided a means of categorising
various water-related activities into discretionary and non-discretionary uses. By
then assigning the likely water use associated with each activity, it was possible to
predict the volume of water at which the second block in the IBT should
commence, if the genuine objective is to limit discretionary use. Some variations
in this volume emanated from the treatment of the data, but clearly the
suggested volume falls well short of that which is presently applied in other IBT
designs in this state.

This exercise highlights the problematic nature of IBT design and also
underscores many of the theoretical objections that have been raised against IBTs
generally. Moreover, IBTs result in complex tariff structures which violate
efficiency and equity principles. This may well explain why economic regulators
have struggled to provide comprehensive and consistent guidelines for their
introduction. In this context, Boland and Whittington (2000:8) observe that 'with
a typical IBT, it is impossible for all but the most analytical and determined user to
deduce the average or marginal price that is actually being paid for water'. By
way of contrast 'a tariff with a single volumetric price is simple, transparent,
equitable, robust, easy to implement, and creates understandable and consistent
price signals'. In addition, using a single volumetric charge does not exclude the
possibility of other instruments to address concerns about the very poor and their
access to water.

On the basis of these data and the mounting professional concern about the
impact of IBTs, it may be preferable to defer the introduction of additional,
inconsistent tariffs. Alternative approaches are available that send appropriate cost
signals and optimise consumer responsiveness. In this context, a single
volumetric charge with limited fixed charges, to address the revenue security of
the utility, would appear preferable. Coupled with consideration of welfare
measures to protect the needy, these stand to deliver enhanced efficiency and
equity than that afforded by an IBT.

References


Boland, J. and D. Whittington (2000), 'The Political Economy of Increasing Block Water
Tariffs in Developing Countries', pp. 215-235 in A. Dinar (ed.), *The Political Economy of


Rogers, P., R. de. Silva and R. Bhatia (2002), 'Water is an Economic Good: How to use
Prices to Promote Equity, Efficiency, and Sustainability', *Water Policy* 4:1-17.


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Taxpaying Made Easy

Andrew Leigh

Suppose that the Australian government decided that once a year, it would ask everyone to fill out a set of forms setting out their status. University students would be required to write down where they went to university, which courses they took, and who taught those courses. Anyone who had used medical services would have to tell the government which doctor they went to, and why. Anyone working for the government would have to fill out a form stating what job they did, and how much they earned. Veterans would have to tell the government what war they fought in, and for how many years. For the average person, the whole process would take eight hours, or a full working day.

If this sounds to you like an inefficient way of collecting data, then consider that the process of filing tax returns in Australia is not much different. Each year, the Australian taxation system requires two-thirds of the adult population to spend an average of eight hours (Tran-Nam et al, 2000) telling the government basically what it already knows. Much of the information in our tax returns is already held in government databanks — to a large extent, the current process involves us producing figures that are then cross-checked against them.

While the administrative burden of small business regulations has been accorded serious attention in policy debates, less notice has been taken of the administrative burden that falls on individual taxpayers. This article argues that by following the example of New Zealand, we could significantly reduce the administrative burden on ordinary taxpayers. Most importantly, the change need not involve any change to tax rates or brackets. One of the barriers that has stood in the way of simplifying the tax filing system is the misperception among some policymakers that making filing easier must involve changing tax rates. Recognising that changing the filing system can be kept conceptually distinct from changing tax rates, tax simplification can be supported by those who believe that tax rates should be higher, lower, or just the same as they are today.

The Other Deadweight Cost of Taxation

Most tax reform plans are focused on cutting top tax rates. The theory behind this is simple: since income taxes deter work, they impose a ‘deadweight cost’. But reducing tax rates (without changing the tax base) has another consequence: it typically means that there is less revenue available to pay for national security,
unemployment benefits, schools, pensions, hospitals and roads\textsuperscript{1}. Survey evidence indicates that most Australians acknowledge this trade-off. They recognise that taxes reduce work, but by a small margin, they prefer more social spending to lower tax rates (Leigh, 2006).

What is often missed in Australian tax debates is that reduced work incentives are not the only deadweight cost of taxation. As everyone who spends the last weekend in October filling in tax forms knows, another deadweight cost of taxation is the administrative burden. Getting your receipts in order for the tax agent or ploughing through the Tax Pack takes time that could be spent doing more productive activities. In 2003-04, the most recent year for which taxation statistics are available, two-thirds of Australian adults filed a tax return (Figure 1). By contrast, just one in five adults in the United Kingdom currently fill in tax returns (number of UK taxpayers from Evans, 2004; UK adult population data from Statistics UK). In most OECD countries, the majority of adults are not required to complete an annual tax return (Owens, 2005).

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{tax_filing.png}
\caption{Tax Filing in Australia}
\end{figure}

How much time do we take to do our taxes? In 1994-95, Binh Tran-Nam and his co-authors surveyed a representative group of Australian taxpayers, and asked them how much time they took to complete their returns (Tran-Nam et al, 2000). On average, they found that Australian personal taxpayers spent 8½ hours each year on their tax affairs. Multiplying this by their hourly wage rate, they found that tax compliance costs each taxpayer around $210. The authors noted that their estimates of tax compliance costs as a share of tax revenue were similar to

\textsuperscript{1} The negative relationship between tax rates and revenue does not hold for a country on the wrong side of the so-called Laffer Curve (see Fullerton, 1980; Laffer, 1981; Stuart 1981; Davidson, 2005).
an earlier Australian study using data from 1986-87 (Pope, Fayle and Duncanson, 1990). Both estimates indicated that the taxpayer compliance burden in Australia — as a share of tax revenue — was several times higher than the taxpayer compliance burden in the UK (Sandford, 1995).

There is little reason to think that the tax compliance costs estimated by Tran-Nam and his co-authors should have fallen significantly over the past decade. For one thing, the share of taxpayers filing through a tax agent has remained unchanged. In both 1994-95 (the year of their survey) and 2003-04 (the most recent year for which data are available), 74 percent of Australian taxpayers used a tax agent (ATO Taxation Statistics, 1994-95:Table P18; ATO Taxation Statistics, 2003-04:Personal Tax Table 4A). Perhaps the advent of electronic filing saved some time (9 percent of taxpayers filed electronically in 2003-04), and more recent innovations such as a shorter tax return and filing by phone may also have helped a little. But these are unlikely to have drastically cut overall taxpayer compliance costs. Converting the estimates of Tran-Nam et al. (2000) into today’s wages gives a figure of $346 per taxpayer (based on the increase in average weekly ordinary time earnings for full-time adults from financial year 1994-95 to June 2006). This means that the cost to taxpayers of complying with the personal income taxation system is around $3.7 billion per year.

To see how we could reduce the cost of tax compliance, we only have to look across the Tasman. Back in the mid-1990s, three-quarters of New Zealand adults were required to complete tax returns. Following a major report on tax compliance (McKay et al., 1998), New Zealand dramatically simplified its tax system in 1999, freeing most adults from the requirement of filling in tax returns (Birch, 1998; Inland Revenue, 1999). As Figure 2 shows, in the most recent tax
year, half of all adult New Zealanders — those whose only sources of income were wages, interest or dividends — were not required to complete a return. Another one-fifth receive a statement from the tax office setting out what the authorities thought they owed, which they had to correct or confirm (this can be done with a telephone call). Only three in ten New Zealand taxpayers now complete tax returns.\(^2\)

**Pre-Population**

One reason the New Zealand tax system allows nearly three-quarters of personal taxpayers not to complete a return is that theirs is a simpler tax system than ours. Many of the tax deductions available in Australia do not exist in New Zealand. Indeed, some have argued that Australia should follow New Zealand in abolishing many of the deductions that are currently available, and lowering overall tax rates. Proposals to 'broaden the base and lower the rates' make a good deal of economic sense, but invariably involve plenty of jockeying, as special interests fight to preserve their favourite tax break.

However, we can make life easier for Australian taxpayers without doing anything so radical. A much simpler reform would be as follows. In August of each year the Australian Taxation Office (ATO) — knowing how much each taxpayer earned from various sources — could send out tax statements, setting out each person's income and tax liability.\(^3\) In other words, the tax forms could be 'pre-populated' with the information already held by the ATO. If a taxpayer then wished to claim certain deductions, they would be free to fill in a tax return. But if not — and provided the taxpayer's only income is from wages, dividends and interest — they would have the option of not filing a tax return. All the taxpayer would then have to do is let the ATO know that he or she agrees with the assessment, and then claim a refund or pay the excess tax. Plenty of taxpayers may choose to forfeit deductions to which they are entitled in exchange for avoiding the hassle of filing a tax return. Indeed, the rise in tax revenue from these forfeited deductions is likely to outweigh any increase in administrative costs for the ATO in moving towards a system of pre-population. Current ATO initiatives (see ATO, 2006 for details) could form the basis for such a transition.

Simplification could not take everyone out of the personal tax system. Self-employed workers, landlords, and others with 'complex income' would still have to complete a tax return. But like New Zealand, we could spare around three-quarters of current Australian taxpayers from wrestling with the Tax Pack, from keeping receipts through the year, and from fretting as 31 October looms.

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\(^2\) These figures are calculated from data supplied via email by Sandra Watson of the New Zealand Inland Revenue - *Te Tari Taake* (11 October 2005). On the impact of the New Zealand reforms, see also Evans (2004).

\(^3\) As part of this system, it might make sense to withhold tax from interest and dividend payments at source, as is presently done for wage and salary income. Under the current Medicare levy system, it would also be necessary for taxpayers with private health insurance to inform the ATO of their fund details (though this would not necessarily have to be updated on an annual basis).
A Conversation, Not a Crusade

Writing in the *New York Times*, US economist Joel Slemrod (2005) noted that calls for tax reform are invariably radical, but radicalism is not always required:

Contemplation of radical tax alternatives is exhilarating, and could help to avoid the kind of loophole-to-loophole combat that tax war veterans recall from 1986, the last time we made wholesale changes in the system. But much progress toward these goals — including eliminating the need for most Americans to file tax returns — can be made within the basic framework of the current system. ... [Some proposals] are calls to join a crusade. We'd be better off just starting a conversation.

Radical tax reformers often argue that their proposals will reduce the need for many people to complete a tax return. As a consequence, those watching the debate often develop the mistaken impression that the only ways to reduce the number of tax filers are to cut rates and abolish deductions, or raise the tax-free threshold. Yet the beauty of removing the requirement for most Australians to complete tax returns is that it can be implemented with any set of tax rates and tax brackets. Simplifying the filing system should be simultaneously on the agenda of those who believe that the tax system should be more progressive than it is today, and those who believe the tax system should be made more regressive. Recognising this, it is difficult to see why reducing the number of tax filers does not command bipartisan political support.

In an era when the ATO deducts most tax at source, it is difficult to see why the typical Australian should spend a full working day every year telling the tax office what it already knows. Instead, it would be better to exempt most taxpayers from the requirement to complete a tax return, so long as the ATO already knows about all the income that they have earned. By saving taxpayers eight hours of work, such a reform would give most Australians the equivalent of an extra public holiday each year. For most Australians, October 31 would be just another day.

Over the past few years, Australian policymakers have focused attention on reducing top marginal income tax rates. Instead, we should focus on making the tax system simpler for ordinary Australians. Like New Zealand, Australia could dramatically simplify the tax filing system, saving many of us the hassle of a day doing taxes, and reducing the $3.7 billion deadweight cost of the personal income tax system that comes from compliance costs alone.

References


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REVIEWS

Playing Nostradamus with Latin America


Reviewed by Rodrigo Taborda

If you are an inhabitant of a developed country and plan to attend a cocktail party, Javier Santiso's *Latin America's political economy of the possible* may be perfect for you. It will give you a shallow description of the region from the early 1980s to the first decade of the present century. You will learn the names of the most important economists, politicians and literary figures of Latin America; and you will pick up the gossip of the region's political and economic circles. Most importantly, you will be able to impress people by describing a quarter of a century of economic policy and political developments with enough generality to make yourself seem like a former diplomat, or former vice-president of 'The Corporation', in one of 'those' underdeveloped countries.

If, however, you are instead looking for a summary of up-to-date political and economic developments in Latin America, then less than half this book will be useful. You will have to dig deep in the sloppy and erroneous literature and historical analogies to see any real facts or obtain any insightful interpretations of the reality of Latin America.

The book is written in three sections. Figuratively, you can think of it as a hourglass that starts broad, arguing that a new development strategy is taking place in Latin America. Then the sand clock narrows to three countries — Brazil, Chile and Mexico. But the clock then broadens again to shed light on this new development process underlyng the whole region. (A new development strategy for a continent of 33 countries — but one applied only to three countries!)

The introduction summarises the book's thesis: after a ceaseless search for utopia — characterised by swings between left and right, and the 'political economy of the impossible' — Latin America has in the last two decades gone through a great economic and political transformation, via the 'political economy of the possible' secured in part by a generalised movement toward democracy; a political system that at the close of the twentieth century 'took root in Latin America soil and endured.'

The longest chapter of the book claims that macroeconomic, political, financial instability and debt default are inappropriate stereotypes of Latin America. To underline his contention the author compares GDP annual fluctuation in Argentina during 1900-1913 with the same during 1981-1996 (somehow forgetting the 1997-2002 period). Not finding a great difference, he states that macroeconomic instability is an erroneous stereotype for the region. The error of the political instability stereotype is underlined by the small differences noted in
the terms for parliamentarians, Supreme Court justices, and central bank governors in Argentina and the United States. For the author, the financial instability stereotype is also mistaken; that form of instability has been curving down since 'it took Mexico 7 years to recover from the 1982 debt crisis and to return to the international capital markets, but barely 7 months after the episode known as the 1994 Tequila Crisis' (p. 59). Finally, on debt default, the author refers to Spain (which defaulted thirteen times between 16th and 17th century) in order to support his contention that 'the record in government defaults belongs to a European country' (p. 60). A comparison of this 300-year old episode with debt default in the 1980's is thus used to disprove debt default stereotype of Latin America.

The book's second section presents economic and political histories of Chile, Brazil and Mexico as the fulfilment of the great Latin American transformation. For Santiso, Chile's current economic success is not the outcome of market driven economic policies implemented in the late 70's and early 80's, but the 'pragmatic search for growth with equity' (p. 97) after the 1989 consolidation of democracy. For the author, an independent central bank, fiscal stability, labour reforms, a new retirement scheme and export led development have no implications for the current performance of the Chilean economy.

For Santiso the political economy of the possible is observed in Brazil with the presidential transition from Fernando Henrique Cardoso to Luiz Ignácio Lula da Silva. He describes the political hurdles Cardoso had to overcome in order to implement economic reforms in Brazil, an effort that coincided with Argentina's financial collapse. The change of government to Lula's presidency is presented as the democratic consolidation of the country since the new president is the founder of 'the Workers' Party, the largest left-wing force in Latin America' (p. 123). Under Lula's government, social security policies, originally proposed in Cardoso's government, were rapidly implemented, thanks to his new political capital.

The final part of the book is a generalisation on the remaining countries of the region. It presents the new alchemy of policy making. 'Instead of wholly structuralist or monetarist solutions, purely neo-liberal free-market, or idealistic social remedies, the preference now is for more flexible and nuanced economic policies' (p. 167).

Santiso also tries to explain how two countries — Argentina and Venezuela — managed to evade the benefits of the great transformation. The description of the Argentinean crisis is accurate and brief, while the Venezuelan experience is depicted as the well known natural-resource curse. But the political events of Argentina are not explored and those of Venezuela misunderstood: the democratic revolution in Venezuela is clearly the outcome of an inherited economic crisis that started three decades ago, and Chavez is amplifying, not inventing, the crisis. But for Santiso, the current events and decaying position of Venezuela in the world economy are not Chavez's fault.

The last chapter declares that the 'profound and subtle transformation taking place in Latin America — a transformation that stems from surging economic pragmatism — is worth celebrating'. (p. 208). Brazil, Chile and Mexico are again
presented as the countries where this transformation has occurred, while the rest of Latin America is struggling to find its political economy of the possible.

What is Santiso Talking About?

Deep into the book one begins to find some views about Latin America that would raise the eyebrows of anyone who has actually lived in, visited, or seriously studied the region. One example: the description of Mexico City as an 'urbane' and 'peaceful' place (p. 140). Mexico City happens to be one of the five most populated cities in the world, it tops the world rankings for air pollution, and no other word but 'chaotic' describes its public transportation. Santiso recalls how Carlos Fuentes (the celebrated Mexican novelist) calls Acapulco, Kafkapulco to ridicule the bizarre opulence of the coastal city. But does not Santiso remember that in the same book (Christopher Unborn, 1989 English edition), Fuentes called Mexico City, Makesicko City? Did Santiso really read the book? This peripheral mistake is disappointing for informed readers, but devastating for the uninformed. What if the central claims of the book are as mistaken as its depiction of cities?

The book has two central claims; the existence of a democratic and political transformation, and a move towards pragmatic economic policy away from neo-liberal policies. Both hard to find in Latin America and poorly defended in the book.

Latin America's Democratic Transformation

Yes, democratic regimes are the norm in the region. But what kind of democracy leads to economic development? Definitely not one where elected presidents are overthrown by their own political allies (Ecuador); or elections are held with immense doubts about legitimacy due to corruption and vote fraud (Mexico, Venezuela); or elections of presidents that render themselves as democratic dictators and impose re-election (Argentina, Colombia, Peru, Venezuela); or elections where presidents last only days (Argentina, Ecuador); or elections where likely winners are unfortunately killed before elections (Colombia, Mexico); and certainly not elections without parties or ideas, but simply a handful of short-term fixes (Bolivia, Venezuela).

For instance, from 1996 to 2006, Ecuador had 7 presidents. Abdalá Bucaram (1996-1997) was overthrown by the Congress arguing 'mental illness'. After two days as president, vice-president Rosalía Arteaga was also overthrown and Fabian Alarcón was interim president up to 1998 (later jailed for 5 years for corruption). Jamil Mahuad won the 1998 elections under strong suspicions of fraud, and resigned in 2000 after a disastrous economic performance. His vice-president assumed power from 2000 to 2002. Then Lucio Gutierrez took over the presidency, but was overthrown in 2005. More recently Rafael Correa was elected after a second round of the presidential election.

Fraud and corruption in elections in Mexico used to be the norm. PRI (Partido Revolucionario Institucional) ruled Mexico from 1929 to 2000. In 1988,
when serious corruption charges finally appeared to be on the verge of ending the 60-year state of single party democracy, PRI forged ahead to a disputed electoral victory. In his six-year rule the PRI candidate, Carlos Salinas de Gortari, faced several corruption scandals. In 1994, Ernesto Zedillo, also of PRI, won after the assassination of the presidential candidate Luis Donaldo Colosio. A truly democratic process was followed only in 2000, when Vicente Fox of PAN (Partido de Acción Nacional) won the election. Recently, in July 2006, only 200,000 votes marked the difference between Felipe Calderon, and Andrés López Obrador.

The political turmoil in Venezuela and its recent ‘democratic demonstrations’ are another example of how wrong Santiso is in positing a democratic transformation. Elections in Venezuela in the last 5 years have been a shameful mockery of any democratic institution in the world. The current president, who led a failed military coup in 1992 and was jailed for two years, was elected in 1998. After writing a new constitution in 1999, new elections were called in 2000, so the initial presidential term of 6 years became an eight-year term. In 2002 a coup overthrew Chavez, but he re-instated himself two days later with the help of loyal high-ranking members of the Venezuelan Armed Forces. After months of popular demonstration against the policies enacted by Hugo Chávez, a referendum was held in 2004 to decide if the president should continue in power. Numerous charges of tampering with election results were raised by local and international institutions, but Chavez remained in power. In December 2006 Chávez was elected again as president and immediately claimed he would reform the constitution to allow his indefinite re-election, the initial 6-year presidency has become a ‘democratic dictatorship’.

In Argentina, Carlos Menem was initially elected for six years, but as usual in the region, after rewriting the constitution, re-election was introduced. Since his departure in 1999 the country has had 6 presidents. In the midst of the economic crisis, from December 2001 to January 2002, the country had four presidents. Some stability finally came when Eduardo Duhalde acted as interim president until the subsequent election of Nestor Kirchner in 2003. Is this presidential instability Santiso’s ‘democratic transformation’?

In Peru and Colombia, incumbent presidents acclaimed themselves to be saviours and called for constitutional change to ensure re-election. Elected in 1990, Alberto Fujimori was re-elected in 1995 and 2000. But challenged by corruption charges and human-rights abuses, he fled the country. In Colombia Álvaro Uribe forced the approval of a law in congress in order to be re-elected to a second term from 2006 to 2010, notwithstanding that re-election was ruled out by the new constitution of 1990. Is this political turmoil, in which each new government makes rules to suit itself, Santiso’s ‘democratic transformation’?

**Latin America’s Pragmatic Policy Making**

The second main argument in Santiso’s book is the transformation into pragmatic economic policymaking by Latin American governments. A barely informed reader would not realise that virtually every country in Latin America endorsed the
Washington Consensus, and applied 'neo-liberal' economic policies to restore economic growth and stability in the region. I do not claim success of the Washington Consensus, but to mask such a cocktail of policies as social pragmatism is simply aberrant.

In Mexico, Colombia, Ecuador, Bolivia, Argentina and Chile, privatisation of state owned enterprises (public utilities, hospitals, pension funds, ports, highways, and public education) are the norm. Macroeconomic policies to control careless politicians have been widely used; central banks are independent of political pressures, monetary policy no longer finances populist measures to hold power, and hyper-inflation seems relegated to textbooks. It is precisely the orthodox macroeconomic management that helped Mexico and Argentina to overcome the 1994 and 1999 currency crises.

Santiso describes the new pension schemes of Chile and Colombia (introduced in mid 1990's) as skilful combinations of socio-economic policymaking free from the forced recipes of the IMF or World Bank. He omits to point out that these reforms are based on standard actuarial studies that conclude that in developing countries pension schemes can only be sustained on the basis of individual savings accounts, while the pay-as-you-go systems have collapsed in the region, and developed countries can finance them only with immense budget efforts. Pragmatism, or prosaic financial orthodoxy?

Santiso claims that free trade agreements (FTA) have become an 'anchor' for good policymaking in Mexico, and that the creation of other trade agreements has been supported by the need of Latin American countries to have a reference point, a mast, with the United States. But the author forgets the increasing economic dependence of Central American economies that have a FTA with the United States, up to the point of not having autonomous policymaking. He assumes that a single FTA will bring growth and income distribution to a country. Pragmatism? Or an anchor that sinks the boat?

A final word on style. While it is charming to think that an economic advisor is interested in art and literature, the misleading parallels offered between these and Latin America is annoying. He has ruined attempts at beautiful description with wrongful selection of passages that reveal his lack of knowledge of Latin American literature. There are more modern Latin American authors than the three famous writers (Gabriel Garcia Marquez, Carlos Fuentes, Octavio Paz and Mario Andrade) used by Santiso.

It remains to ask: what were the editors of MIT Press thinking when they published this book? Who recommended this manuscript for publication? We will never know, but a hint can be grasped when we see that the book is at the forefront of the latest MIT Press 'Economics and Finance' brochure; and its reviewers are worldwide recognised economists. To not be a commercial disaster the book needs to be sold fast, in high volumes and requires a shallow reader. Such a reader need only go through the front and back matter, and will be ready for the party.

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Indigenous Labour Supply


Reviewed by Greg Barrett

This Research Monograph is a very timely addition to the literature on Australia’s indigenous labour supply. Many parts of remote Australia, that have significant indigenous populations, are experiencing rapid growth in labour demand. The mining industry has recognised the indigenous population as a potential labour force and some firms have set indigenous employment targets. On the supply side of the labour market, the Howard government is putting additional incentives in place to move people from income support into employment. These will affect a high proportion of indigenous adults living in remote areas and the monograph highlights some of the issues that will be faced in achieving this goal. But can the indigenous populations supply the required labour? Taylor and Scambary from the Centre for Aboriginal Economic Policy Research at the Australian National University, examine in detail the labour market and the potential indigenous labour supply in Western Australia’s Pilbara region. Their approach is descriptive with each chapter focussing on a particular issue and there is no attempt to formally synthesise the information.

Pilbara Iron commissioned this study and has set an indigenous employment target of 15 per cent of their workforce (525 indigenous workers). While the Pilbara’s adult indigenous population is nearly 5,000 persons and is growing by over 100 persons per year, Taylor and Scambary identify and analyse the substantial constraints on potential indigenous labour supply. These constraints include demography, income status, education, housing, health and crime.

Crime and interaction with the justice system excludes a large part of the potential indigenous workforce. Around 310 persons are likely to be in custody or under supervision at any one time and around 1,050 are arrested each year. Virtually half of all indigenous males aged between 15 and 34 years are arrested at least once a year. The nature of these crimes makes employment more difficult (for example, the loss of a driver’s licence).

Poor health excludes many indigenous people from employment. Around 1,020 persons are disabled and a similar number have diabetes. Around 2,800 are hospitalised each year. Life expectancy for indigenous males is around 55 years. A 15 year old indigenous Pilbara male has only a 50 per cent chance of reaching retirement age. In addition, poor health outcomes for children limit their ability to participate in schooling.

The condition and availability of housing in the Pilbara also excludes many from the labour market. Much housing is poorly located, poorly maintained, without basic services and extremely over-crowded. Indigenous labour supply is
dependent on an adequate housing infrastructure which is often lacking. Overcrowding has also been identified as a significant factor in creating health problems.

Professionals, tradespersons and clerical workers are three significant occupational groups in the Pilbara. Each of these occupations requires a relatively high level of education and training but indigenous people in the area do not have the necessary educational background. Around 4,200 have no post-school qualifications and 1,500 have less than year 10 level schooling. Of concern for the future are the low apparent retention rates for indigenous students from Year 10 to Year 12. Less than 100 indigenous students in the Pilbara complete year 12 each year. Jobs in the mining industry require skills that the indigenous workforce lacks.

Income status and demography provide ‘deeper structural hurdles’ to greater labour force participation. Around 3,600 indigenous persons receive Centerlink income support. This may have incentive impacts on labour supply. Dependency ratios (children, aged and disabled) are high and discourage workforce participation.

Without significant policy interventions to address the indigenous labour supply constraints identified by Taylor and Scambary, it is likely that the mining companies’ indigenous employment targets will be hard to achieve, especially as many individuals face multiple disadvantages.

There are, however, some grounds for optimism. Indigenous employment growth was 6.5 per cent per annum between 1996 and 2001 (including Community Development Employment Projects scheme under which indigenous people work part-time for their welfare entitlements). The mining companies have set employment targets and funded training for indigenous people. Successful indigenous businesses are being established. There are several innovative and successful education and training programs in the Pilbara.

Taylor and Scambary have produced a well written and presented research monograph which will be of most interest to specialists. It contains numerous tables and much detailed description of the position of indigenous Australians in the Pilbara, an example of a growing regional labour market with potential for employment. This is in contrast to many other remote labour markets where the potential for employment growth remains limited. The monograph provides a useful basis for more analysis of the difficulties faced in promoting indigenous employment in the booming mining sector. The general readers will find much of value, especially the direct quotes from indigenous people on each of the chapter issues, but I suggest they begin with an overview in the summary in the final chapter.

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