The Taxable Capacity of Australian Land and Resources

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Previous work on measuring Australia's land wealth is reviewed and a time series of Australian land values constructed for most of the twentieth century. Estimates are made of Australian land income and compared to Australian tax revenues. It is demonstrated that Australia could finance tax cuts and international tax competition for labour and capital tax bases through higher fiscal contributions from land revenues. (JEL H27, Q00, F02: taxation, land values, fiscal competition)

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I Introduction

As the liberalization of financial markets and removal of tariff and non-tariff barriers to free trade in goods and services proceeds, greater interest is emerging in optimal tax policies for open economies. On one side are those who argue that globalisation requires some form of international tax organization to protect capital income tax bases from erosion and who sometimes refer to tax competition as part of "the dark side of globalisation."[1] On the other side are those (including the present author) who regard tax competition as a healthy force driving reluctant bureaucracies towards more sensible low-tax policies for mobile factors of production.[2] The debate is becoming more fierce as globalisation proceeds and issues of privacy, national sovereignty and individual liberty will soon be debated as fiercely as at the time of the American Revolution.

A natural question thus arises: if one does not favour a global tax police to enforce residence-based taxes on capital income and if one does not favour higher taxes on labour income, where is the money to fund governments to come from? Does globalisation necessarily mean the end of redistributive fiscal policies to help the socially disadvantaged? Those who remember their Adam Smith will recall that the national income arises from land, labour and capital and, as Adam Smith recognized, taxes must come from one or more of these three factors of production. They will further remember that Adam Smith praised taxes on ground rents and that, if he was not a Physiocrat, his tax policy recommendations were remarkably close to those of the Physiocrats. Given the pressure income tax systems are under from

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1. For example, see the following press comment by Will Davis, Public Affairs Centre, OECD, Washington DC published at www.motherjones.com. "The Organisation for Economic Co-operation and Development is concerned about the growing presence of offshore tax havens ("Trillion-Dollar Hideaway," November/December). Tax havens allow business and individuals to escape their tax obligations, which deprive countries, developed and developing alike, of revenues necessary to sustain economic growth. They are also often safe havens for proceeds of political corruption, illicit arms dealing, and the global drug trade, facilitating what Treasury Secretary Lawrence Summers calls the dark side of globalization. To eliminate such harmful tax practices, our member governments are working with 35 jurisdictions identified as tax havens to reform their financial systems by next summer."
2. See, for example, OECD (1998) and Dwyer (2000) and (2002).

globalisation and excessive revenue demands, it does not seem an unduly antiquarian pursuit to ask how much revenue could a developed country such as Australia raise from its land and natural resources. Is there an alternative to ever harsher and rising taxes on capital and labour incomes?

Section II reviews conceptual issues in measuring land income in relation to taxable capacity. Section III reviews previous attempts to measure the value of Australian land and explores practical difficulties involved in measuring land income. Section IV presents the author's estimates of land income as a percentage of Australian tax revenues for most of the twentieth century. Section V concludes that land income is a sufficiently large tax base as to enable Australia to reduce very substantially income tax rates on labour and capital. Australia can cut taxes on mobile factors of production to compete successfully for global investment without losing its ability to fund a viable public sector.

2 Conceptual issues in measuring land income in relation to taxable capacity

Economists have almost universally accepted the proposition that a lump sum tax (in the sense that no action of the taxed person can alter his liability)[3] is ideal and most have accepted the proposition that a tax on land values is such a theoretically ideal tax. For example, Professor Martin Feldstein, former Chairman of the US Council of Economic Advisers, acknowledges a tax on unimproved land values "involves no distortion" and is clearly efficient (Feldstein 1976, p 96). Yet there has been little advocacy in economists' discussion of tax reform for a move towards greater reliance on such taxes. One of the apparent reasons for such a lack of advocacy is the view that land revenues are inadequate to finance a modern State.

Yet there are several reasons why the revenue potential of land-value taxation could be under-estimated.[4] It becomes apparent that under-

3. Contrary to some impressions, a lump sum tax does not mean a fixed dollar amount, such as head tax. Even a head tax can induce behavioural change, such as emigration. What the phrase really means is a tax which is fixed regardless of any action of the taxpayer. Thus a land value tax may change with valuations but these are market phenomena outside the control of the taxpayer.
4. The arguments are based on Dwyer (1980, p 329-330). The observations seem to remain essentially valid twenty-two years later.

estimation of land values has plagued attempts to measure Australia's private wealth and that aggregate figures based on direct figures from official valuations are conservative.

First, national accounts do not pretend to measure land income as a share of national income, in the sense of the classical division of national income into rent, wages and profits. Notably, the corporate veil is not pierced. A great deal of land income would appear to be included in corporate profits.[5]

Second, the amount of land income to be imputed to residential dwellings is not easily available for most countries. Australia is unusually fortunate in having official figures which give some idea of residential land values.

Third, historical cost accounting principles give a downward bias to the value of land and other natural resources as shown in the accounts of business enterprises. Under historic cost accounting, assets are recorded at their purchase price not their current market value. In the case of long-lived assets such as land and buildings, the divergences between historic cost and market value can become considerable, especially since the land usually appreciates while buildings depreciate. It is true that the values of land and other natural resources may now be less often under-valued in company accounts given threats of takeovers and asset-stripping, but the point retains force. A company may revalue its assets not in the main accounts but in notes to the accounts or implicitly attribute land value to another asset category, such as goodwill or omit it altogether.[6]

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5. The mixing of profits on physical capital investment with resource rents is common in company accounts for the obvious reason that investors do not care where their returns come from. For example in its 2000 Annual Report, the Australian telephone carrier, Telstra recorded a 23.2% return on assets but Telstra did not capitalize the value of its telecommunications licences, a resource asset and put no value on its land rights such as easements or upon its spectrum licences. Hence the return on average assets (Telstra, 2000, p 264) shown as 23.2% may largely reflect an undervaluation of land (spectrum or easement) assets in the balance sheet. This is not to say Telstra should charge users for easements over their land but what may be reasonable for commercial accounting may not be designed to list hidden, unpaid-for, land assets. Telstra's high rate of return on assets would thus appear to incorporate a large resource rent component.

Fourth, in the United States, the income tax depreciation allowance for buildings provides a strong motive to understate land value and overstate building value in property assessments.[7]

Fifth, sub-soil assets and spectrum rights etc have often been omitted. The values of mineral, forest, fishery, airwave and water rights often do not appear at all in either private or national accounts as such. Australia is again fortunate in that attempts to value some of these assets have been undertaken by the Australian Bureau of Statistics. There is increasing awareness of the value of natural resources (e.g. mineral, forest, fishery, airwave and water rights) included in the economic concept of land. In Australia, water rights are in the process of becoming tradeable assets with explicit market values (though with some offsetting decline in the value of the land to which the rights formerly attached). Spectrum and fishery licence fees are now also recognized as commercially valuable assets. Oil resources have long been recognized as valuable, so valuable that some countries such as Brunei and Saudi Arabia do not need to resort to taxes found elsewhere.[8] The example of such countries which can fund public expenditure from one kind of land resource should make economists pause before dismissing the idea that land revenues can replace much or most other taxation as a source of public revenue.

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6. For example, the phone carrier, Telstra Corporation (2000, pp 176-179), includes land and site improvements in its balance sheets at $185 million (p 176) using cost and directors' valuations while noting (at page 177) a higher (largely) market valuation of $682 million. Companies do not need to include the market values of land assets in the formal accounts to repel takeovers - a note to the accounts is sufficient.
7. This argument is due to Professor Mason Gaffney. The same tendency does not prevail in Australia as the Federal income tax building depreciation allowance is irrelevant to State and local government valuations of unimproved land values.
8. Brunei has no personal income tax, sales tax, payroll tax and no capital gains tax. Only companies are subject to income tax, http://www.hawaii.gov/dbedt/ert/cp/brunei.html. Income taxes of Saudi and expatriate employees working in the Kingdom were abolished in 1975. While Saudi law requires that all foreign and Saudi companies pay a tax on profits earned in the country, companies with joint-ventures having at least 25% Saudi ownership are exempt from income tax for a period of ten years. In May 1993, the Minister of Finance and National Economy stated that all foreign companies which are actively involved in the capital expansion of various industrial projects in Saudi Arabia will be exempted from paying taxes on profits made in the Kingdom, http://www.arab.net/saudi/business/sa_taxes.html.

Sixth, land values may be depressed by capital gains taxation which operates as a fine on the market reallocating land to its best use. To some extent this effect may be mitigated by tax planning through like-kind exchanges or roll-overs, but this is not always possible.[9] Transfer taxes such as stamp duties may have a similar effect in depressing land values. Australia's adoption of a capital gains tax in 1985 and increased State stamp duties on conveyances[10] have been measures which would have depressed land productivity and hence, one assumes, market values in the aggregate relative to what they might otherwise be.[11]

Seventh, land values can be depressed by excessive zoning or other restrictions on use or by rent control legislation.[12]

Eighth, taxes on capital and labour also reduce the demand for land; consequently as these taxes were reduced and land value taxes increased, one would expect some increase in the base of the land-value tax. The sixth and eighth points raise questions of the dynamic effects of replacing transaction taxes on land or income taxes on labour and capital with a land value tax. This would require modelling which has not been attempted by any writer known to this author and is not pursued in this paper, though its practical significance may be enormous. The prime example of the possibilities is Hong Kong, which has raised a significant proportion of government revenue from land lease premiums, rentals and rates. Land revenue has allowed Hong Kong to pursue a policy of low tax rates on labour and capital. Corporate profits are taxable at 16% after deduction of interest which is not taxed. Wages and salaries are taxed at a top rate of 15% while capital gains and foreign-source income are not taxed at all.[13] In effect, the risk free

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9. US tax law has often allowed deferral of recognition of capital gains in case of exchanges of like kinds of property. No such general rollover concession exists in Australian tax law.
10. The New South Wales Treasury's comparison of interstate taxes and charges shows stamp duty on conveyances as now reaching a top rate of 5.5%, http://www.treasury.nsw.gov.au/pubs/trp00_3/middle.pdf
11. A view apparently shared by the Harvey Review of State Business Taxes (2001, p 39) which noted "Stamp duty on conveyancing, as a turnover tax, … [and a] tax barrier to transfer and change of use means some land is retained in less productive uses"
12. Rent control legislation was introduced in New South Wales in World War II and phased out gradually afterwards.
13. See Appendix A

return to capital is largely tax-exempt.[14] The resulting demand from international business for operational space in Hong Kong has meant that, far from land values being depressed by being used as a public revenue source, they have grown strongly historically and could be tapped further to provide even lower tax rates on business and labour income.[15]

Ninth, appreciation of land values is land income insofar as it represents accruals of income, as future higher rents come closer to the present. To apply a low observed yield rate to land values in attempting to measure land income[16] is wrong if the land is appreciating with increasing demand for its use.

To see why this is so, it is important to realize that, particularly with site rents, land income may be greater than current rental payments. Because rents are generally expected to rise, land values generally show a rising pattern. In this common situation, the current rental yield observed on the market value of land does not reflect the full amount of land income being earned in a period (which it would if rental values were static). Land income is the current rental for a year plus the accruing gain due to future higher rents coming one year closer to receipt. Land income may therefore be measured by using the current yield rate *plus* the annual increment in land value, see Gaffney (1970, pp 182-186) [17].

The key point is that land income is not just what is received by way of current cash rents. If today's market rental is only 4% of land value

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14. The risk free return to capital is usually taken to be the rate of interest on a government bond which is taken to have virtually zero risk of default. The rate of interest on bank deposits is similar, assuming banks are reasonably supervised. Because Hong Kong companies can deduct interest payments, the profits tax tends towards a tax on entrepreneurial profits only for a highly geared company, rather than representing a tax on capital income as such.
15. Some may say that Hong Kong and Singapore are special cases, being city states with scarce and valuable land. But all cities have valuable land reflecting agglomeration economies and urban site values count for a large part of land values in Australia. One could as easily argue that countries with resource rents on top of urban site rents should have an even greater land revenue per capita than small city states.
16. For convenience I use the term "land income" to comprehend economic rent in the classical sense, that is, the income accruing to natural resources. This includes both site rents of land and resource rents, such as mineral resources.
17. See Appendix A

when market interest rates are at 10%, that situation only persists because future land rents are expected to be higher: the land appreciation of 6% needed to justify such a case really represents the maturing of future rents, just as a promissory note appreciates in value as its date for payment approaches.[18]

"Land income" as defined above is not the same as rents in the national accounts statistics which exclude revaluations. The terms "national income", "national wealth" and "private wealth" are used in their normal statistical senses. Wealth concepts are stock concepts unlike GDP, GNP or national income which are flow concepts.

There is not a simple relationship between flow income concepts and stock concepts of wealth (for example, labour earns income but is not valued as an asset). Although taxes are often expressed as a proportion of GDP, this is an arbitrary convention and not always very relevant: for example, GDP ignores depreciation and takes no account of the share of GDP accruing to non-residents. A low tax-to-GDP ratio could be quite compatible with a heavy tax burden on resident investors. It seems more meaningful in a comparison of potential tax bases to compare land income as a tax base with the proceeds being raised from other taxes, since tax reform often is a case of replacing one tax with another.

3 Previous attempts to measure the value of Australian land

Of all countries, Australia seems uniquely suited by history to best test the issue of whether land furnishes a potentially large or small tax base, relative to other taxes. Australia has a long tradition of local government finance through taxation of unimproved land values and its statistics on the subject are among the world's best. Two of its Founding Fathers, Sir John Quick and Sir Samuel Griffith, were passionate advocates of land

18. If a bank buys a $100 bill of exchange for $95 and holds it for 9 months to maturity on 2 July, it will include the accrued discount of $5 as income for the financial year in which the discount was earned, not as income earned in the later financial year of receipt. In effect, by including accrual gains on land holding as land income, one is merely measuring income by levelling out income streams. Just as it is wrong to count as wholly "income" current cash flow from a depreciating asset such as a mine, it is wrong to ignore future rising cash flows in working out what is the return to landholding.

rents as public revenue and its capital city, Canberra, was founded on leasehold tenure so that it would be self-funding through land rent revenues. The question of the taxable capacity of Australian land (including all natural resources) is one of importance not only for Australia but may serve as a guide to other countries with less information on their potential land revenues.

Economists, such as Samuelson, following the work of Raymond Goldsmith in the United States, have tended to assume that land rents are only 3-5% of national income and therefore the revenue potential of land taxation is not great compared to income taxes.[19] That view has been challenged and one unofficial United States estimated that land rent was near 20% of national income.[20]

For Australia, direct comparison of land income with tax revenue is possible. One estimate suggests that "*Australian site values alone were about $67,359 million in 1977. Given that land values in Australia were rising at 23% per annum and allowing for inflation of 15% at that time, also accepting a net 3% cash rental on valuation (after an assumed 2% tax rate), we obtain a rate of return from landownership of 11%. This gives a land income of $7,409 million per annum, which is not insignificant when compared with personal income tax of $11,054 million and company tax of $2,824 million for fiscal year 1976-77.*" [21] This simple calculation was supported by a further calculation for New South Wales which showed a site value per capita of $5,371.68, giving an annual land income of $590.88 per capita. For Australia as a whole, all Federal taxes (excluding Customs) for 1976-77 amounted to $1,134.62 per capita.[22]

Scott (1986) provides a full review of earlier attempts to measure the value of Australian land and provides his own estimates. No attempt is made here to duplicate his work in reviewing earlier attempts but he makes several significant observations.

First, he takes it as almost axiomatic that the value of land as a percentage of national wealth will tend to decline as the economy develops away from land-using primary industries. He argues (Scott, 1986, p 38): "A declining share for the value of land in the national

19. See Dwyer (1980, pp 329, 445)
20. Dwyer (1980, p 331), citing Steven Cord.
21. Dwyer (1980, p 321)
22. Dwyer (1980, p 332). Note that Sydney's site values accounted for $18,533 million out of the whole State's site values of $25,693 million, suggesting Hong Kong and Singapore are not unique in exhibiting an urban concentration of land values.

wealth is to be expected from a growth of other assets." Elsewhere he explains (Scott,1986, p 3): *"The importance of export industries in the generation of income and the contribution which land – on which export industries were then based – had therefore been able to make to the nation's prosperity, had given the land a high profile in the composition of the nation's wealth in the nineteenth century. The growing urbanisation of the population, the growing importance of the domestic market and at the development of less land-intensive industries to service it throughout the twentieth century, began a trend which reversed the position. The share of the value of land in private hands – and even of land and improvements – in total private wealth fell over the first half of the century. The trend in the second half of this century is, unfortunately, less clear.*

"From being something over a third of private wealth at the beginning of the century, land had fallen to something just over a fifth (or, on another estimate, between a fifth and one tenth) by the mid-point of the century. Land and improvements taken together, which had comprised over two-thirds of private wealth when the century began, had fallen to perhaps about one-half by the century's mid-point.

"A falling ratio of land to wealth is consistent with the experience of the few other countries for which figures are available over time…

"The Australian ratio (as generally quoted and despite some conceptual and statistical differences in the measurement of private wealth) is high, however, by comparison with the ratios for nearly all countries for which figures are available at comparable times – in the decade of the fifties of this century.… In round terms, the Australian ratio might be said to be about one in five; for nearly all the other countries, the ratio is less than this. On the other hand, the Australian ratio of land and improvements to private wealth was lower than that for most of these other countries." He also notes (Scott, 1986, p 41): "Between 1903 and 1947 and between 1947 and 1956, land, in these [researchers'] estimates (adjusted to improve comparability, at least conceptually), constituted a falling proportion of the total private wealth of Australia. ...".

The argument that the value of land is a falling share of national wealth is not necessarily persuasive.[23] Since land, whether rural or urban, is the fixed resource and its value is accordingly the beneficiary of most productivity gains through capitalization of rising scarcity

23. See Appendix B

rents.[24] Even if it were true that the value of land is a falling share of national wealth, it does not necessarily follow that land is a tax revenue source of declining potential.

First, the relative decline of primary industries has been matched by increased urbanisation which has led to increased site values for urban land. Indeed, Scott himself (1986, p 22) notes that figures for the value of land in private hands derived from the available published figures show that "the national total for 1981/82 was 14 times that for 1960/61. This is more than three times the rise in the Consumer Price Index."

Second, it is not clear that a declining ratio of the value of land to total private wealth is necessarily meaningful in looking at the taxable capacity of land in relation to existing income and company taxes. The growth of private wealth may involve a degree of financial intermediation and double counting. A policy of government deficit budgeting will increase the amount of private wealth in the form of government bonds but this does not represent increased national wealth. Nor is it easy to eliminate intra-sectoral claims. Just as it is sometimes difficult for accountants to decide whether to consolidate one corporate entity's accounts with another, so it is difficult, if not impossible, to "consolidate out" all transactions within the private sector. For example, a businessman who operates through two companies and three trusts, may appear to an outside observer to be five unrelated entities each with their own equity.

Third, the concept of private wealth in Australian hands does not necessarily coincide with any measurement of Australia's taxable capacity since there are Australian assets owned by overseas interests. Given that Australia is a persistent capital importer, large segments of Australian industry and natural resources are owned by overseas investors.[25] While income tax treaties may impose some limits on Australia's ability to tax revenues[26] from such overseas-owned Australian-based assets (depending on factors such as thin capitalisation), there is no such inhibition on Australia's ability to collect revenue from land or resource rent taxation. The success of the crude oil levy, later

24. Thus the value of urban land in Chicago, New York and other cities rose with the invention of skyscrapers and elevators and hitherto unused resources such as the spectrum for 3G mobile phone technology acquire value as man discovers how to use them.

converted to a resource rent tax, is an indicator of how overseas multinationals may be more exposed as revenue contributors through land taxes than through income taxes.[27]

Perhaps too much attention has been focussed on land as a component of private wealth. If the question of interest is the capacity of land taxes to replace other taxes, what counts is land income relative to tax collections. Rather than attempting to draw any conclusions from land values measured as a proportion of national wealth, if one wishes to inquire into the taxable capacity of Australian land and resources it seems more fruitful to try the direct approach and ask "What is land income and how does it compare to tax revenue?" This is especially so in Australia, where there is a long tradition of land valuation and taxation.[28] But the direct approach to measuring land income has some problems.

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25. Overseas shareholders feature strongly in the share registers of dual listed companies such as BHP-Billiton and Rio Tinto as well as holding shares in other companies. It is estimated by the Investment and Financial Services Association that foreign investors account for 37% of the Australian share market, see *Australian Financial Review*, 6 November 2002 p 63. Overseas-owned Australian land is clearly a large part of business land values, especially if the resources sector is included and explains why States such as Queensland historically levied higher land taxes on absentee owners.
26. Although Australia's double tax agreements historically gave some greater emphasis to preserving the taxing rights of the source country, they still follow usual OECD patterns such as limiting source country withholding taxes on dividends, interest and royalties (eg Articles 8,9,10 of UK Agreement) and excluding business profits not associated with a permanent establishment (eg Article 5 of UK Agreement).
27. For example in 2000-01, petroleum resource rent tax was estimated at $1,280 million and crude oil excise estimated at $259 million. By comparison, only $225 million was collected in dividend withholding taxes, see Commonwealth Treasury *Budget Statements 2000-2001*, Statement No 5, pp 5.6, 5.10, 5.13.
28. As Scott (1986, p 4) notes: "Unlike the aggregates of other assets which would appear in a national balance sheet, the value of land in Australia is the subject of extensive official attention. It is a basis of taxation; and the attention it attracts has its origin in the importance of property taxes in the financing of local government. The Commonwealth also levied a land tax for some forty years, until 1951-52 when it relinquished the tax and left the field open to the States. They were slow to enter the gap but did. However, the States remain today seemingly reluctant to make very much use of land taxation over and above the requirements of local government."

First, land valuations may tend to be conservative due to lags in valuation and the natural desire of administrators to avoid appeals to Courts over valuation disputes.[29]

Second, valuation techniques may attribute too much value to exhausted or recouped invisible improvements or to visible or invisible but useless, outmoded or unwanted "improvements."[30]

Third, land values for rating purposes may exclude sub-soil mineral, gas or oil deposits as well as invisible land assets such as the electromagnetic spectrum licensed to radio and television stations and mobile phone carriers.[31] In addition, assets such as national forests which are licensed for logging may not appear as assets. As Scott (1986, p 44) notes: "In addition, the [wealth] estimates published by Garland and Goldsmith (1959)... exclude sub-soil assets, e.g. mineral deposits."

Nonetheless, the direct approach of comparing taxes with land values is both feasible and enlightening. Tables 1 to 3 compare general government sector receipts and Commonwealth taxation receipts to land values for the decade ending in 1977/78. They indicate a very large potential land tax base.

Table 1 provides a first overall glance. Table 1 compares total Australian government revenue from taxes, fees and fines with land values as computed by Scott for the years 1967-68 to 1977-78. It is interesting that, even with missing land values for subsoil assets or

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29. In relation to valuation conservatism and lags, Scott (1986, pp 9-10) notes: "It would, however, impose an impossible burden on any administrative structure to value all properties in an administrative area simultaneously. Valuations are therefore made over a period for application as at a particular date. Moreover, the sales and purchases of properties on which valuations are based occur independently of and, naturally, without regard for the administrative requirements of rating authorities so that valuations for official purposes are made at varying periods after sales have taken place. Although allowance is made for such time-loss, at least to some extent, a general element of conservatism is introduced into official property valuations in these two ways. This conservatism is reinforced, moreover, by one of the very elements contributing to uniformity – the appeal system, available to ratepayers, which necessarily relies for evidence of value on past events." The net result as Scott (1986, p 11) concludes is that: "It is clear that, in the outcome, valuations must have lagged behind values."
30. See Appendix C
31. Though formally owned by the Crown and held under licence, mineral or other rights may, like Crown leases, often have considerable private market value because the licence fees do not extract all economic rent.

spectrum rights and with conservative valuations, the ratio of total revenue to land values suggests considerable revenue potential, with land income (defined as including revaluations gains) almost equalling total taxes in 1972/73 and 1975/76 as shown by the figures in the last column of 107.28% and 109.5% for taxes as a percentage of land income. The variability of revaluations affects year to year ratios but, even so, the rate of growth of land values not only matches the growth of total taxation revenue but appears to be able to outstrip it at times, as when the ratio of taxes to land income drops from 197.97% in 1973/74 to 109.5% in 1975/76.[32]

Table 2 shifts the focus from *all* taxes to *income tax*. Table 2 compares Commonwealth government revenue from personal income tax and company income tax with land values as computed by Scott for the years 1967-68 to 1977-78. The result is startling: land income easily exceeds company tax (which never exceeds 75.68% of land income and falls as low as 12.59%). For some years, land income even exceeds the sum of both company and personal income tax, as in 1971/72 (45.94% plus 17.52%), 1972/73 (40.5% plus 15.07%), 1974/75 (69.86% plus 20.9%) and 1975/76 (47.1% plus 12.59%). Given the likely investment yield on any particular plot of land (which one might expect to vary between 5 and 20%, depending on whether increased rents or changes of use were in prospect), the figures suggest higher taxation of land values could entirely replace company taxes or replace most of the personal income tax. Far from being a small potential revenue source, land values look a remarkably buoyant potential source of revenue.

However, Tables 1 and 2 use land value figures which were adjusted by Scott to add back existing capitalized land taxes.[33] While I have used

32. For 1975/76, land revaluation of $15,904 million plus assumed current rents at 5% of $3,657 million comes close to total taxes of $21,240 million.

33. If we are seeking to measure the total value of land, as Scott was, we must make allowance for the fact that taxes on land are capitalized, reducing the private market value of the land (though not its underlying economic value). A land tax puts the government in the position of a co-owner or, from the historical perspective, restores to the Crown some of its rents as ultimate owner of the land of the realm. Scott (1986, p 25) therefore comments that his "figures were adjusted for the capitalised value of property taxes collected, taken as local government rates and land taxes levied by State Governments." He observes that capitalization of rates on land would not be necessary if the benefits of local government services affected land values positively to the same extent as rates and did so equally between States but notes (correctly) that neither equality can be relied upon.

Scott's *adjusted* figures (adjusted for capitalized land taxes) in Tables 1 and 2, if we are seeking to measure the *additional* revenue-raising capacity of land taxes to replace *other* taxes, we do not need to make such an adjustment. We may simply look at the remaining private value of land and compare it to the annual company or personal income tax collected to get a feel for whether there sufficient annual taxable capacity in land values.

Table 3 therefore replicates Table 2 over a slightly longer period but ignores Scott's adjustment for capitalization of land taxes.[34] As capitalization of land taxes involves more assumptions, there seems merit in using the rawer, "harder" figures for private land values. The conclusions from Table 3 are still much the same as from Table 2. For example, land income exceeds the sum of personal and company income taxes in 1971-72 (55.33% plus 21.1%), 1972-73 (44.52% plus 16.57%), 1973-74 (69.1% plus 24.03%) and 1975-76 (55.6% plus 14.86%). Given the buoyant rate of appreciation of land values shown over the years, it still seems safe to say that a tax on land values could easily finance the abolition of company tax. It also seems likely that a tax on land values (at a higher rate) could alternatively finance the abolition of much of personal income tax. Company tax is always much less than land income and personal income tax is never more than 129% of land income.

We start to see that land income (treating increments of value as accruals of rent)[35] is amply sufficient to finance sharp reductions in *marginal* personal income tax rates or company tax rates. Since most revenue from personal income tax comes from the lower marginal tax brackets and a cut in the company tax rate is offset to some extent by reduced value of depreciation deductions and franking credits, the

34. Table 3 here uses his Table 7a instead of his Table 9.

35. As noted above, a vital question in comparing tax revenues to land income is how should one measure land income? Where land values are stable, land income is the annual rental for the land. But where land is appreciating, it means that future rentals are expected to be higher. How does one annualize a rising rental to a level rental stream in order to ascertain the land income which could be available without loss of value? In the absence of reliable historical data on this point, adopting a conservative 5% fixed rental yield and adding the annual value increment, as representing the accrual of future rentals, may be taken as approximating the full annual rent (per Gaffney 1970, pp 182 - 186). This has been done in Tables 1 to 3.

figures thus far suggest even a moderate tax on land values could significantly improve the tax competitiveness of the Australian economy.

The data thus far points to three basic conclusions:

1. Land values are sufficiently high that any reasonable estimate of returns to landholding would show a large ability of land value taxation to replace personal income or company taxes.
2. Land values (even if under-estimated) show a sufficiently strong growth pattern to suggest that land taxes would be reasonably buoyant revenue sources.
3. Land values have been understated due to conservative official valuations and omission of sub-soil, fishery, and spectrum assets.

But the figures seen so far do not exhaust the information we can glean on the long-term performance of land income relative to tax revenues.

4 The current estimates

Drawing upon and extending data used in Tables 1 to 3, Table 4 presents a much longer series from 1910-11 to 1998-99 showing the growth of all Australian tax revenues and land income over most of the twentieth century. This has been constructed by the author building on the notable and valuable work of Scott, Herps, Coleman and others. These previous studies have been sponsored by, undertaken for, or adopted by the Reserve Bank of Australia, the Commonwealth Grants Commission and the Australian Bureau of Statistics. The methodology is set out in Appendix I and involves both adjusting land valuations for lags and smoothing increments to land values. Smoothed land income consists of an assumed annual current yield of 5% on land values plus an annual increment (called the "accrual yield") based on long run compound growth rates for land values.

The results are remarkable. They show that even though taxation has risen strongly as a percentage of GDP over the century, the growth of land values and land income has largely kept pace.

Table 4 shows that before the Second World War, the growth of land values and tax revenues tended to be more restrained. This may reflect the supremacy of the gold standard, Depression and a horror of deficit financing by governments. In the post-World War II period, the growth of land values and land income has outstripped the growth of tax collections, even as Keynesian deficit financing and the growth of the

welfare state generated a larger public sector. Total Australian taxes peaked as a percentage of 400.4% of land income in 1951-52, yet by 1994-95 total taxes were down to 138.3% of land income, notwithstanding the growth of the public sector in the economy since 1950.[36]

Table 4 suggests that while at times it may have appeared to some observers that land was shrinking as a component of national wealth or income, such a perception may have been an illusion due to financial intermediation and multiplication of gross claims in the economy. The results in Table 4 show the growth of Australian land income more than holding its own relative to tax revenues, even though tax revenues have increased so much over the twentieth century as a percentage of national income.

At first sight this is a puzzle. It might be argued that land income should decline as a percentage of tax revenues for two reasons. First, there has been a shift away over the past century from land-based industries such as agriculture and mining to manufacturing and, later, service industries which are not land-intensive. Second, taxes such as income tax are based on a broader base of economic activity than land, so the capacity of land income to replace other taxes must be declining.

On closer reflection the apparent contradiction of these arguments by the data seems explicable. First, it is not the *quantity* of land used but its *value* that counts in measuring a land income tax base: service industries may not use broad acres, but city office blocks sit on very valuable land.

Second, much of the income tax base is indirectly land-related in origin: corporate accounting profits (eg for mining companies) do not distinguish between capital and land returns (that is not their purpose). Capital gains are often based on real estate either directly or through holdings in companies, mutual funds or pension funds.

Third, there is another reason for land income to keep up with or even exceed taxation revenue which has often escaped attention. Much spending of tax revenue adds to land values and the demand for land. It has long been recognized (eg by Hotelling (1938, p 300), Vickrey (1977 p 349) and Lowell Harris (1973) – among many economists) that tax-financed government spending on physical infrastructure such as roads,

36. See the trend in column 35 of Table 4. (The table omits spreadsheet columns which were only used for subsidiary data or computation and checking purposes.)

electrification, water systems etc adds value to land.[37] To the extent that such spending is justified on cost benefit grounds, one would expect land values to rise by more than the expenditure. But it is less well recognized by others that government *social* spending can also be capitalized in land values.

When tax revenue is paid as unemployment benefits or as age pensions, including *a fortiori*, targeted payments for rent subsidies, it inevitably underpins a level of demand for residential real estate which also affects commercial land values as well.[38] Further, to the extent that government social spending is usually available to citizens or residents of a country, one would expect little leakage outside national borders.[39]

At the same time, owner-occupied residential land is outside the scope of income tax (but not necessarily of rates or land taxes). Hence, the existing tax base is excluding part of land income while the tax revenue from it is being used in part to push up land values. Given the importance of residential land in overall land value statistics, such phenomena may explain why land income has risen so strongly in line with tax revenues.

Fourth, land is well recognized as a natural hedge against inflation. As taxes have risen and the value of money fallen over the post-World War II period, the holding and retention of income producing land has been the best defence for many investors against the combined ravages of taxation and inflation. The impetus for investors to "buy and hold" real estate is a powerful opposing reaction to the threat of high inflation

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37. The most elegant example of this is the "Henry George Theorem" developed by Vickrey, Stiglitz and others where land rents precisely reflect spending on public goods or subsidies to cover fixed costs of infrastructure priced at marginal cost. Arnott and Stiglitz examine the generality of the Henry George Theorem that, in cities of optimal size, aggregate land rents equal expenditures on public goods.
38. For example, the exemption of family homes from social security income and assets tests increases residential land values by subsidizing the holding of properties off the market. Houses that would otherwise be sold to earn an income are retained by pensioners to avoid income and assets tests. In many cases, the age pension might be seen as a subsidy to those who inherit a house which an age pensioner parent would otherwise have sold.
39. To the extent that aged people can migrate and welfare pensions become portable, one can imagine Australian tax revenues propping up values in Italian villages or US tax revenues propping up land values on the Australian coast, but such migration and portability is the exception.

and taxation which may help explain why the growth of land values has paralleled the rise of taxation.

Whatever the reasons, it is interesting to take the 1998-99 figures from Table 4 to see if we can get a better feel for the true "bottom line".

Table 4 shows the following figures for 1998-99 –

Total Australian taxation	$177.9 billion
Total individual income tax	$76.7 billion
Total company tax	$20.7 billion
Smoothed land income	$132.7 billion

But even this may be an under-estimate. In addition to land and subsoil assets, there are spectrum, native forest and fisheries resources. A tentative estimate for 1998-99 using a common accrual factor of 8.92279% plus a running yield of 5% (totalling 13.92%), shows: –

Asset class	**Value**	**Income**
	($billion)	($billion)
Land[40]	822.7	
Subsoil assets	130.2	
Subtotal	952.9	132.7
Spectrum, etc[41]	2.7-58	0.4-8

40. In the past land and site values have reflected the benefit of water rights or reticulation services for gas, electricity etc. If these rights are stripped from land or utility services are charged for on a monopoly basis rather than marginal cost, land and resource rents can be adversely affected: monopoly rents enjoyed by utilities can grow at the expense of the lands they were created to serve.

41. ABS (2001) puts a value of $2.7 billion on the spectrum as at June 2001. This figure is based only on the third generation spectrum (3G) licences and does not include existing radio and TV licence rights. The Productivity Commission (2000, pp 186-187) estimated in its Broadcasting report that $211.1 million was paid as annual radio and television licence fees in 1997-98 and the growth had been 8.6% compound in real terms over the twenty years from 1978-79. The licence fees are based on a percentage (between 0.25% and 9%) of advertising revenue. ABS Catalogue No 8680.0 gives total income for radio and television spectrum licence holders at approx $4.5 billion in 1996-97. ABS catalogue 8145.0 gives 1996-97 revenue for telecommunications carriers at $20 billion. If one third of these amounts represents resource rent than the value of the spectrum could be as high as $8 billion annually or $58 billion (capitalized at a 14% earning factor).

Native forests[42]	2.5	0.4
Fisheries[43]	0.8	0.1
Total	958.9-1,014.2	133.6-141.2

The "bottom line" reinforces the overall conclusion from Table 4 that land-based tax revenues are indeed sufficient to allow total abolition of company and personal income tax.[44] Further, to the extent that some taxes such as rates, land tax, resource rent taxes and even part of income tax on land rents are already capitalized in lower market values for privately-held land, the figures would tend to understate the capacity of land income to replace existing taxes.[45]

5 Conclusion

Previous attempts to measure the value of Australian land have tended to focus on its position as part of national wealth rather than its annual taxable capacity. It appears land income has been under-estimated. However, it is possible to generate an almost century-long series to

42. ABS *Australian National Accounts: National Balance Sheet*, 1998-99, Consolidated balance sheet and sectoral balance sheets as at 30 June 1999, p 21
43. Figures were kindly supplied by Debbie Brown of ABARE for value of boats with and without quota licences. These were aggregated to give a value of $834.6 million for the total Australian fishery.
44. This paper does not examine the political economy question of whether voters and parliaments would *wish* to do so. It is merely pointing out that there is an unrecognised but real social choice to be made about tax bases if one is concerned about losing revenue from mobile tax bases in an era of globalization. If that question arises, this author must declare some sympathy with the view that "If you are foolish enough to try to tax what runs away (in preference to taxing what cannot) that is your choice and you cannot be heard to complain about other countries' pursuing more rational choices"
45. In some cases, the imposition of higher annual land holding charges would squeeze "speculative water" out of market values for land, but this effect would tend to be concentrated on land held semi-idle by speculators (e.g. on urban perimeters) rather than land held by serious users. The market value of the bulk of land being used productively could be expected to increase with increased competition for land, when net returns after tax to land-using labour and capital rose. It should also be noted that there is no way to avoid a land value tax by re-categorizing land income as labour or capital income. The market value of land is fixed by demand external to the owner and hence his tax burden is an unavoidable "lump sum" tax so far as he is concerned. Further, if he sells to try to avoid the tax, his buyer discounts for the tax in the purchase price.

compare land income to Australian taxation revenues and thus see the large scope for replacing other taxes with economically efficient taxes on land and resource rents.

The logical implication is that Australia could choose to make a fundamental shift in tax policy. Australia could increase Federal reliance on land revenues[46] and use the proceeds to make substantial cuts to marginal personal and company income tax rates. Australia could become a tax haven and out-compete Hong Kong and Singapore in attracting regional or international headquarters or investment. There is nothing inevitable about Australia being a generally "high tax" country which discourages investment nor is it inevitable that Australia becomes a branch office economy. Australia may have different forms of land resources to Saudi Arabia or Brunei but, like Hong Kong and Singapore, Australia's land is worth a fortune as a tax base. Australia is as well positioned to finance large cuts in personal, corporate and consumption tax rates (or even abolition of one or more of these) through taxing land incomes.

Rather than complaining about the so-called "dark side of globalisation" and joining in OECD complaints about the threat of other countries' supposedly "harmful tax practices" to OECD tax revenues and redistributive social spending, Australian policymakers and commentators would be better advised to look at what they stand on – "black gold" can mean dirt and mere location as well as oil. In a world where capital is mobile and labour supply is shrinking in line with demographic decline, an immobile tax base is the only tax base which makes economic sense. Australia is indeed a lucky country to have in its land and resource values a tax base of such large potential. But is it a clever enough country to use that potential tax base to its advantage?

46. Land tax was originally a Federal tax and there is no Constitutional impediment to a Federal tax on land values being introduced and earmarked for reduction of personal and company income taxes.

Appendix A

(REF FOOTNOTES 13 AND 17)

Hong Kong

Only income and profits derived from Hong Kong are subject to tax and there is no tax on capital gain, dividends or interest. The current profits tax rate is 16% for corporations and 15% for non-corporate taxpayers, http://www.info.gov.hk/info/tax.htm. The role of land revenues in underpinning Hong Kong's low tax rates is recognized even by critics. In a submission of 5 October 2001 to the Advisory Committee on New Broad-based Taxes on "A Broader-based Tax System for Hong Kong?" Mr Alan Lung Ka-lun, Chairman of the Hong Kong Democratic Foundation, wrote "We feel that the paper does not go sufficiently into the nature of the tax system that we currently have. Although the take from land taxes has been lower in recent years (the only years analysed in the paper), over the medium to long run, land-related taxes have been the mainstay of the fiscal system. The very high yield from land sales, premium on conversion, rates, stamp duty on property, rentals and other property-related income, has enabled the Government to keep direct tax rates relatively low. However, this benefit has come at the cost of massive distortion to our economy – through overreliance on property – and higher property prices for everyone.", http://www.hkdf.org/papers/011005tax.htm. The last sentence embraces a number of debateable issues such as the differing effects of land holding taxes versus transfer taxes or whether property prices would fall if a government gave away land.

Accruals of Income

Tax theorists in the Haig-Simons tradition would agree with this concept of income but it is not necessary to be in that tradition to accept it. In this respect, the writer agrees with Gaffney (1970-71) pp 411-412 that accruals of income are income but notes that double taxation can still occur if income is taxed on both an accrual and on a cash receipts basis. An annual tax on land values does not tax cash rental receipts so the problem of double taxation is academic for land value taxes while remaining a live issue for design of income and capital gains taxes. For example, given a 10% discount rate and a 50% income tax rate, land yielding $10 in cash rental will be valued at $50 (the present

value of the $5 after-tax income stream). If, unanticipated, the pre-tax rental jumps to $40, the after tax land value will be $200. The income tax revenue is $5 annually before and $20 after. The difference between the pre-tax value of $400 and the post-tax value of $200 already represents a capital tax of $200. But a capital gains tax also takes a further $75 (half of $150 less $50) which is not creditable against income tax on future rental receipts.

Appendix B

(REF FOOTNOTE 23)

Reference must also be made to the work done by Piggott (1987) and Callen (1991) of the Economic Research Department of the Reserve Bank of Australia. Their work is significant for two reasons. First, they carefully reviewed previous studies on the private wealth of Australia and, second, they noted reasons why the value of land in national wealth was likely to be understated. Piggott (1987, p 61) argued that his estimates represented a close approximation to the market value of the nation's private wealth. Piggott observed (1987, p 62) that private wealth included intangible assets such as goodwill or patent rights and claims on other sectors, notably the government and overseas sectors. Significantly, Scott's previous (1968) estimates of land values based on local government assessments were not regarded as a reliable guide to the total market value of land because of their conservative valuation basis (Piggott, 1987, p 63). Further, previous wealth estimates (including those of the Australian Bureau of Statistics) were criticised for not reflecting the value of land on which dwellings are built which Piggott seeks to overcome by using price indices (Piggott, 1987, p 65). In comparing his estimates with the results of previous researchers (Piggott, 1987, p 69) attributed most of the discrepancy to residential and rural land. The net result was that, as at the second quarter of 1985, Piggott (1987, p 69) found a total personal wealth of $793.9 billion of which for $439.9 billion was residential land and dwellings and $102.5 billion rural wealth, half of which represented land values. A significant amount of land wealth would also have been the included in the $116.2 billion of business assets. Piggott noted that while the use of a capital city index for house prices may have given an upward bias, there was a bias in the opposite direction in that "the average site value of newly completed homes is less than the average for the whole stock, since

many new completions are located on the fringes of cities." The significance of Piggott's work is that it suggested previous estimates of Australian private wealth were seriously underestimated and most of that under-estimation was accounted for by undervaluation of land assets. In particular, it strongly suggests that estimates of land values, such as Scott's, which are based on official valuations are likely to be substantially below current market values.

Callen (1991) reviewed Piggott's work. Instead of using a price series for dwellings based on the four capital cities of Sydney, Melbourne, Adelaide and Brisbane, he used an index based on a weighted average of capital city and other area prices. This lowered the estimated market value of the dwelling stock. But he also argued that commercial property had been undervalued and that while the dwelling stock accounted for 52 percent of private wealth, business assets accounted for 37 percent in 1990 (Callen, 1991, pp 1, 4). For business and real estate, he found that "in 1989 land represented 26 per cent, 33 per cent and 31 per cent of the value of the property for retail, office and industrial structures respectively" (Callen, 1991, p7). Given that he used NSW Valuer-General's data on site values, these percentages seem conservative. In addition, corporate land wealth is still understated, as mining companies were excluded (Callen, 1991, p 5).

The significance of Callen's work lies in its suggestion that business land wealth had been seriously underestimated previously and a higher valuation would be consistent with the ratio of business income to household dwelling rent in the national accounts. As he puts it: "the ratio of business wealth to dwelling wealth is 0.71, compared to 0.28 in the Treasury's estimates. If one thinks of GDP as the return on wealth ... business wealth should be about 2.5 times as large as dwelling wealth. This follows from the observation that the gross operating surplus of corporate and unincorporated business is about 2.5 times as large as imputed and actual rent, which can be thought of as the return on the dwelling stock.... Hence, it is likely that, despite being large relative to previous estimates, the estimate of business wealth presented here still understates its true share of total wealth." (Callen, 1991, p 9). It is also worth noting that overseas ownership of Australian business assets was estimated at $180.5 billion out of a total of $524.6 billion (Callen, 1991, p 15), which indicates the importance of keeping in mind that the tax base of Australian land includes Australian land owned by non-resident commercial enterprises. Finally, Callen (1991, p 21) notes that

Treasury's estimates of private wealth had excluded rural wealth and excluded the value of land from non-dwelling construction.

Appendix C

(REF FOOTNOTE 30)

In relation to the issue of non-useful or exhausted or recouped improvements, Scott (1986, p 5) notes: "The rates levied by local governments are based on official valuations of land and/or land and improvements. Valuation concepts and methods have changed over the years but valuation concepts were constant for long periods and, indeed, until recent decades.... However, after the middle of our own century, it became evident that the concept of unimproved capital value presented grave difficulties in application and contained a growing element of artificiality. This, and other considerations, led to official inquiries in various States into valuation concepts and practices. The outcome has been the widespread adoption of a concept of site value (sometimes designated land value) to displace the concept of unimproved capital value." As Scott (1986, pp 5-6) explains: "The difficulty which had emerged in application of the concept of unimproved capital value was the virtual disappearance from land markets, as time passed, of land as defined in accordance with that concept. The definition excluded 'the improvements if any thereon or appertaining thereto, and made or acquired by the owner or his predecessor in title'... The difficulty was twofold – to determine whether any such improvements had been made and to find any comparable land without them which had recently been marketed. No difficulty was necessarily encountered where clearly visible improvements existed but not all improvements remained visible to succeeding generations (for example, tree felling, long regarded as a necessary improvement for maximising monetary returns). Equally, as the country was settled, land in its virgin state became scarce and even non-existent in many localities, thus often denying to the valuer any basis for valuation of a parcel of land by comparison with transactions in land in the required, unimproved condition. Site value is a concept whose adoption can preclude the emergence of these problems. It differs from unimproved capital value by limitation of the exclusion of improvements. Improvements, under the new concept, exclude and site value (or land value) includes such things as clearing (of timber etc); reclamation (including draining);

excavating and grading; and so on.... Doing so eliminated, in principle, the two problems of identifying and allowing for what had often been called 'invisible improvements' (Garland, 1934). Nevertheless, there were still some important interpretations of the legislation governing valuation left resting on case law." (For example, the determination of unimproved value or, now, site or land value as well, taking into account the influence of surrounding improvements (see Garland, 1934)).

While the adoption of site value or land value gets rid of the impossible hypothetical valuation problem, one may note that it may not go far enough. Some improvements, such as tree felling, might now be seen as having detracted from the long-term productiveness of land and this is equally true of urban areas where buildings that have outlived their usefulness have to be demolished before one can obtain a clear site for construction. If a developer pays $4 million for a property with a building which would take $2 million to reproduce and then spends $1 million demolishing the building, what is the value of the land? Is it $2 million, the value of the parcel less the costs of reproducing the (unwanted) building or is it $4 million (the total paid for the parcel) or is it $5 million (the cost of getting the clear land)? In other words, it is tempting, but wrong to assume that everything on the land or done to it always and forever is a valuable improvement and the re-use value of land is its site value, see Gaffney (1970, p 173). Most structures outlive their usefulness but the value of land as a site may grow on. Buildings depreciate in the sense of being worn out or unsuited for use or location but location value does not physically wear out: the value of location rests on a spatial relationship, it may become more or less valuable depending on propinquity but it does not wear out in same sense as improvements.

In this connexion Scott (1986, p 12) argues that: "There are also some special problems which valuers encounter (as well as that of allowing for differences in value due to changes in use). One of them is estimation of an unimproved or site (or land) value of a parcel of land in a fully built-up area. The problem can only be resolved by deduction of an estimated value of its improvements from the price obtained in the market for some parcel of land together with its improvements. The practice is not favoured and only in these particular circumstances is the deductive method accepted in Australia in the mainland States." However, one may well argue that a deduction of valuations of

improvements approach is incorrect for it assumes the improvements are always wanted in their present state and that the traditional Australian valuation approach of valuing on the basis of the highest and best use available for the site rather than its present use is the theoretically correct approach.

Appendix I

NOTES ON TABLE 4: AUSTRALIAN TAXATION RECEIPTS COMPARED TO LAND AND RESOURCE VALUES 1910-11 TO 1998-99

These notes relate only to Table 4 as reproduced here. Due to space limitations only some columns are printed in this article (some of the omitted columns were for computational checks only such as checking smoothing of raw data. Notes relating to land data issues have been retained here). A full version of Table 4 with accompanying notes is available on request from the author.

The table is largely based on RBA figures from *Australian Economic Statistics 1949-50 to 1994-95* p 92 Table 2.17 with figures from Scott (1986) and Scott (1969) and ABS value of land estimates. However, additional data has been introduced as detailed below. (Tables 1, 2 and 3 also are sourced largely from the same RBA publication.)

NOTES ON DATA COLUMNS

(1) Total Australian taxation

1909-1910 to 1948-49 from Wray Vamplew ed (1987) *Australians: Historical Statistics*, p 256, Table GF1-7

Data from 1949-50 to 1994-95 is taken from RBA *Australian Economic Statistics 1949-50 to 1994-95* Table 2.8, Column 1. The RBA series measures total Commonwealth, State and local taxes fees and fines and therefore is slightly higher over the period 1949-50 to 1981-82 than the corresponding figures from Wray Vamplew. The difference in 1949-50 and the 1950s and 1960s is, however very slight and the slightly greater divergence in the 1980s may be due to the greater tendency of governments to use fines as tax collection devices, a tendency which justifies a more comprehensive measure of total taxation.

Data from 1995/96 for individual income tax taken from ABS Cat. No. 5506.0 *Taxation Revenue Australia 1997-98* Table 1. The figure for 1998-99 is not absolutely comparable with earlier years due to the

introduction of accrual accounting (which has its merits and demerits): differences would be due to taxes accrued but unpaid and the like.

(2) Taxation as % of GDP

1909-1910 to 1948-49 from Wray Vamplew ed (1987) *Australians: Historical Statistics*, p 256, Table GF1-7

Data from 1949-50 to 1994-95 is taken from RBA *Australian Economic Statistics 1949-50 to 1994-95* Table 2.8, Column 2.

(3) Commonwealth Government Taxation Receipts: Individual income tax

Between 1949-50 to 1994-95 Commonwealth taxation revenue data taken from Reserve Bank of Australia compilation, Australian Economic Statistics, p 92 Table 2.17

Consistent with RBA practice in its published Lotus spreadsheets, Commonwealth taxation data from 1995/96 onwards for individual income tax is taken from Commonwealth Treasury *Budget Statements 2000: Budget Paper No 5* Appendix D Revenue Statistics p 5-30 and revisions to earlier years have been ignored on the basis that they may include classification differences to ABS 5506.

(4) Company tax

Between 1949-50 to 1994-95 Commonwealth taxation revenue data taken from Reserve Bank of Australia compilation, Australian Economic Statistics, p 92 Table 2.17

Consistent with RBA practice in its published Lotus spreadsheets, Commonwealth taxation data from 1995/96 onwards for company tax is taken from Commonwealth Treasury *Budget Statements 2000: Budget Paper No 5* Appendix D Revenue Statistics p 5-30 and revisions to earlier years have been ignored on the basis that they may include classification differences to ABS 5506.

(16) Unlagged Land Values Mid Year

1910-11 to 1959-60

Unimproved land value data from 1909-1910 to 1959-60 is taken from Scott (1969, p 27 and Appendix). Scott states (Appendix p 1) that these figures "are presented in terms of calendar years" which is taken to mean as at the usual mid fiscal year December valuation date. These pre 1960-61 figures exclude the ACT but, as the ACT figure was only

$21.0 million out of an Australia-wide total of $6,517.8 in Scott (1986, p 23) for 1960-61, the omission is not serious for earlier years.

1960-61 to 1981-82

Land value data from 1960-61 to 1981-82 is unlagged valuation data from Scott (1986, Table 5, p 23).

There are some overlap years between Scott (1969, p 27) and Scott (1986, p 27). The relevant figures are as follows:

Year	**Scott (1969, p 27)**	**Year**	**Scott (1986, Table 5, p 23)**
Dec	**$m**		**$ m**
1960	6421	1960-61	6517.8
1961	7414	1961-62	7326.9
1962	8163	1962-63	8168.3
1963	9263	1963-64	9363.8
1964	10082	1964-65	9933.0

Scott (1986, p 22) explains that the lower figures for these years in his later study are due to "subsequent downward revisions of published figures". We have adopted his later estimates for these years.

1983-84 to 1987-89

Figures for land values from 1983-84 to 1987-89 are taken from ABS 5241.0 *Australian National Accounts: National Balance Sheet 30 June 1995* Table 3.2 page 31 and are based on M R Coleman *Report on Land Valuation Data*, Commonwealth Grants Commission *Report on General Revenue Grant Relativities* 1993 Volume 3.

1989-90 to 1997-98

Figures for land values from 1989-90 are taken from ABS 5241.0.40.001 *Australian National Accounts, National Balance Sheet 1998-99 Table 28 Value of Land* and previous issues. Although the rate of growth of land values may seem high, it is explicable if rental values are growing. In this regard, one notes that a circular distributed for the Investa Property Syndicate in the Australian Financial Review in May 2001 for its prospectus dated 30 April 2001 stated that "Prime net effective [office] rentals have grown at an average rate of 12.6% per annum over the 4 years to December 2000."

(17) Scott's Lagged Land Values

These are taken from Scott (1986, Table 7a, p28). Because inflation increased in the post World War II period and there were increasing lags in making valuations, Scott (1986, pp 24-25) adjusted his data. The effect was to set back in time the years to which valuations applied. Scott's adjustments took account of the differing lags in different States and between city and other areas. Lags were neither uniform over time or between States or parts of States. Valuation lags varied from an 8 year period in Queensland outside Brisbane but shortened to about 12 months to NSW capital city areas.

Because Scott's lagged data covered only a part of the time period this data was not used and a more naive lag adjustment was used as described in (18). The result appears not greatly different.

(18) Lag-Adjusted Land Values

As noted above, Scott (1986) drew attention to the sometimes long lags in valuation data.

A naive 3 year lag produces results similar to his more detailed lag adjustments and seems robust for the post World War II period. A 3 year lag is therefore applied to the Scott (1986) and (1969) figures in column (16) back to mid World War II, resulting in interpolating the missing valuation years (a 2 year lag is applied to the figure for 1943-44).

No adjustment for valuation lags is made to the raw figures prior to 1940-41 as inflation was lower or non-existent over most of that period. The monetary situation changed after adoption of Keynesian policies after World War II and valuation lags would have become more significant over that period.

No lag adjustment is made to the land value figures from ABS from 1983-84 onwards.

This results in a gap for lag-adjusted land values for the years 1979-80 to 1982-83.

1979-80 to 1982-83

The figures for these years are computed in the following manner,

From Herps (1982, p 31) and Herps (1981, p 68) we have the following figures for urban land values

Estimated Site Value of Urban Land

State or Territory	At 1.7.78	At 1.7.79	At 1.7.80
	$m	$m	$m
New South Wales	34 000	39 000	52 000
Victoria	27 000	27 000	29 000
Queensland	8 000	8 400	11 000
South Australia	4 600	4 900	5 300
Western Australia	6 100	6 700	6 900
Tasmania	1 400	1 520	1 520
Northern Territory	n. a.	n. a.	n. a.
[Totals ex-NT	81 100	87 520	105 720]

From Herps (1985, p 30) we have the following figures for urban land values

Estimated Site Values of Urban Land

State or Territory	At 1.7.81	At 1.7.82	At 1.7.83
	$m	$m	$m
New South Wales	71 000	76 000	73 000
Victoria	33 000	35 500	38 500
Queensland	14 000	18 000	19 000
South Australia	6 500	6 800	6 900
Western Australia	8 000	8 900	9 300
Tasmania	1 800	1 900	2 100
Northern Territory	735	850	980
[Totals	135 035	147 950	149 780]
[Totals ex-NT	134 300	147 000	148 800]

From Herps (1988, p 76) we have the following figures for urban land values

Estimated Site Values of Urban Land

State or Territory	At 1.7.84	At 1.7.85	At 1.7.86
	$m	$m	$m
New South Wales	92 268	102 000	108 000
Victoria	50 403	63 500	71 500
Queensland	26 550	28 560	29 500
South Australia	14 010	17 500	19 000
Western Australia	13 907	15 200	15 500
Tasmania	2 676	2 870	2 950
Northern Territory	1 223	1 440	1 550
[Totals	135 035	147 950	149 780]
[Totals ex-NT	134 300	147 000	148 800]

We may thus compare the Herps figures for a subset of land values (ie excluding NT, ACT and rural values) with the ABS/Coleman figures for all land values for the 1984 to 1986 years and derive a markup factor which may be applied to the earlier Herps figures to derive full estimates of all Australian land values for the 1979-80 to 1982-83 years. The results are as follows:

	Herps	ABS	Scott (1986)	Ratio	Interpolated Figures
1.7.78	81 100		91259.5	113%	
78-79					
1.7.79	87 520				144 215
79-80					
1.7.80	105 720				174 205
80-81					
1.7.81	134 300				221 300
81-82					
1.7.82	147 000				242 227
82-83					
1.7.83	148 800	245200		164.78%	
83-84					
1.7.84	134 300	279700		208.27%	
84-85					
1.7.85	147 000	302600		205.85%	
85-86					
1.7.86	148 800	357600		240.32%	
86-87					

Interpolated figures are calculated by applying a factor of 164.78% to Herps' figures. In theory the difference should represent rural lands and the land values for the ACT and NT and any residual lag effects.

(19) Value of Subsoil Assets

Figures for value of subsoil assets from 1989/90 are taken from ABS 5241.0.40.001 Australian National Accounts, National Balance Sheet 1998-99 Table 29 Value of demonstrated Sub-soil Assets.

(20) Value of other Resource Assets

This includes the value of other resource assets such as spectrum rights, fishing rights and native forests. For 1998-99, an estimate has been made of spectrum licence values plus fisheries and these have been used to produce a land income figure for that year only. The use of an accrual

yield figure derived from non-depletable land to derive an income figure for depletable or renewable resources may involve some bias upwards, though for minerals this could be offset by undiscovered reserves coming on stream.

(21) Value of Land Resources

These are ultimately derived from columns (16) and following (notes on which are above). It is the sum of columns (18) *Lag-Adjusted Land Values,* (19) *Value of Subsoil Assets* and (20) *Value of other Resource Assets*.

(22) Annual increment

This is the increase in (21) *Land and Resource Values* over the corresponding value for the previous year.

(23) Rate of Increase

This is (22) *Annual increment* expressed as a percentage increase over (21) *Land and Resource Values* for the previous year.

(24) Current Yield

A current yield factor of 5% is applied to the *Land and Resource Value* for each year. As the valuation figures relate to the year used for rating, they are taken as the estimated values at the beginning of the fiscal year to which current yield and accrual factors may then be applied to compute accruing land income for that fiscal year.

(25) Accrual Yield

Because there is a long series for unimproved land (or site) values, accrual yield factors are computed from the growth of (18) *Lag-Adjusted Land Values*. Note that they are not calculated using the value of other land resources such as sub-soil assets but this should not cause an over-estimate of land and resource income as the rate of growth of these assets has been greater than site values over the years for which the ABS has provided data.

Because of different monetary conditions, accrual factors are computed separately for the 3 periods: pre-WW II up to 1939-40 and after; War and post War-boom; the post-War economy.

1910-11 to 1939-40

The long term rate of growth of land values is given by 1707 = 862(1 + g)^30, that is 2.304% compound over the 30 years from 1910-11 to 1939-40 inclusive. However, rather than using this growth rate or an internal rate of return (both of which would involve smoothing the actual recorded land values) an iterative process has been used to compute that rate of growth which, if applied to the *actual* land values recorded, would generate sufficient total increments over the 30 years to take the total from $862 million to the actual $1,707 million for the opening of the 1940-41 year. This accrual factor applied to the land value for each given year gives the accruing increment for each year which is termed the "accrual yield". The accrual factor for this period is 1.9679%.

1940-41 to 1956-57

The long term rate of growth of land values is given by 6517.8 = 1707(1 + g)^17, that is 8.200% compound over the 17 years from 1940-41 to 1957-58 inclusive. This period is chosen because it covers War and post-War recovery and ends with the first year derived from Scott's (1986) data. The corresponding accrual factor is 9.3648%.

1957-58 to 1998-99

The long term rate of growth of land values is given by 822700 = 6517.8(1 + g)^41, that is 12.525% compound over the 41 years from 1957-58 to 1998-99 inclusive. The corresponding accrual factor is 8.2582%.

Gaffney (1970a, pp 182-187) discusses why increments of land value represent accruals of land income. There are various ways this accrual might be measured - for example, the dollar change in value from year to year; an increment based on arithmetic average growth rate or an internal rate of return. In effect we are trying to level out a growing annuity. We have chosen the method set out here of accrual factors as a reasonable smoothed rate of return. It differs somewhat from compound growth rates depending on how the actual pattern of land values over the period differs from a compounding growth curve.

To the extent that earlier year valuations are underestimates, accrual factors may be overstated, but there would be a correspondingly reduced current running yield. Conversely, adjusting for valuation lags has the opposite effects. Given the length of the series, there does not seem to be cause for great concern on these counts.

The accrual factors are applied to the total figure for all land and natural resource assets to derive a figure for accruing land income to be added to the running yield to give total land income for each year. As only site or unimproved land values are available before 1989-90, for years before then land income is necessarily incomplete in that it omits returns from sub-soil assets, natural forests, fisheries, spectrum rights or statutory easements owned by utilities. Of course not all these natural resource assets are included even in later years. Only sub-soil assets are included before 1998-99.

(26) Total Crude land Income

This is the sum of (24) *Current Yield* plus (22) *Annual increment*.

(27) Total Smoothed land Income

This is the sum of (24) *Current Yield* plus (25) *Accrual Yield*.

(30) Personal Income Tax as % of smoothed land income

This is (3) *Commonwealth Government Taxation Receipts: Individual income tax* divided by (27) *Total Smoothed land Income.*

(33) Company tax as % of smoothed land income

This is (4) *Company tax* divided by (27) *Total Smoothed land Income.*

(35) Total Australian taxes as % of smoothed land income

This is (1) *Total Australian taxation* divided by (27) *Total Smoothed land Income.*

(36) Company and personal income tax as % of smoothed land income

This is (30) *Personal Income Tax as % of smoothed land income* plus (33) *Company tax as % of smoothed land income.*

(37) Smoothed land income as % of company and personal income tax

This is the reciprocal of (36)

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Table 1: General Government Sector Receipts: All taxes as a percentage of land values, 1967/68 to 1977/78 ($million)

	Taxes, fees and fines	Total revenue	Land Values	Annual Increment	Rate of Increase	Current Yield	Total Land Income	Taxes as % of land value	Taxes as % of land income
1967/68	6047	6527	25766			1288		23.47%	
1968/69	6760	7288	27429	1662.7	6.45%	1371	3034	24.65%	222.80%
1969/70	7742	8336	27534	105.8	0.39%	1377	1483	28.12%	522.22%
1970/71	8631	9320	30347	2812.3	10.21%	1517	4330	28.44%	199.35%
1971/72	9863	10606	36707	6359.9	20.96%	1835	8195	26.87%	120.35%
1972/73	10819	11637	44563	7856.4	21.40%	2228	10085	24.28%	107.28%
1973/74	13761	14666	49061	4498	10.09%	2453	6951	28.05%	197.97%
1974/75	17774	18884	57235	8173.7	16.66%	2862	11035	31.05%	161.06%
1975/76	21420	22734	73139	15904	27.79%	3657	19561	29.29%	109.50%
1976/77	24906	26580	80110	6971	9.53%	4005	10976	31.09%	226.90%
1977/78	27077	29197	88049	7939.5	9.91%	4402	12342	30.75%	219.39%

Sources: Reserve Bank of Australia, Australian Economic Statistics 1949-50 to 1994-95, Table 2.8 page 78

R H Scott, The Value of Land in Australia, Table 9, p 31

Table 2: Commonwealth Government Taxation Receipts compared to Land Values, 1967/68 to 1977/78 ($million)

	Individual income tax	Company tax	Total taxes, fees etc.	Land Values	Annual Increment	Rate of Increase	Current Yield	Total Land Income	Personal Income tax % of land value	Personal Income tax % of land income	Company tax % of land value	Company tax % of land income
1967/68	2175	823	4954	25766			1288		8.44%		3.19%	
1968/69	2377	986	5533	27429	1662.7	6.45%	1371	3034	8.67%	78.34%	3.59%	32.50%
1969/70	2855	1122	6389	27534	105.8	0.39%	1377	1483	10.37%	192.58%	4.07%	75.68%
1970/71	3175	1358	7199	30347	2812.3	10.21%	1517	4330	10.46%	73.33%	4.47%	31.37%
1971/72	3765	1436	7983	36707	6359.9	20.96%	1835	8195	10.26%	45.94%	3.91%	17.52%
1972/73	4084	1520	8522	44563	7856.4	21.40%	2228	10085	9.16%	40.50%	3.41%	15.07%
1973/74	5485	1907	10955	49061	4498	10.09%	2453	6951	11.18%	78.91%	3.89%	27.43%
1974/75	7709	2306	14232	57235	8173.7	16.66%	2862	11035	13.47%	69.86%	4.03%	20.90%
1975/76	9213	2463	17003	73139	15904	27.79%	3657	19561	12.60%	47.10%	3.37%	12.59%
1976/77	11047	2753	19813	80110	6971	9.53%	4005	10976	13.79%	100.64%	3.44%	25.08%
1977/78	12118	3010	21549	88049	7939.5	9.91%	4402	12342	13.76%	98.19%	3.42%	24.39%

Sources: Reserve Bank of Australia, Australian Economic Statistics 1949-50 to 1994-95, Table 2.17 page 92
R H Scott, The Value of Land in Australia, Table 9, p 31

Table 3: Commonwealth Government Taxation Receipts compared to Land Values, 1964/65 to 1977/78 ($million)

	Individual income tax	Company tax	Total taxes, fees etc.	Land Values	Annual Increment	Rate of Increase	Current Yield	Total Land Income	Personal Income tax as % of land value	Personal Income tax as % of land income	Company tax as % of land value	Company tax as % of land income
1964/65	1569	700	3816	13851			693		11.33%		5.05%	
1965/66	1729	791	4219	15441	1590.7	11.48%	772	2363	11.20%	73.18%	5.12%	33.48%
1966/67	1921	774	4491	16522	1080.8	7.00%	826	1907	11.63%	100.74%	4.68%	40.59%
1967/68	2175	823	4954	18232	1710.3	10.35%	912	2622	11.93%	82.95%	4.51%	31.39%
1968/69	2377	986	5533	19756	1523.3	8.35%	988	2511	12.03%	94.66%	4.99%	39.27%
1969/70	2855	1122	6389	20929	1173.5	5.94%	1046	2220	13.64%	128.61%	5.36%	50.54%
1970/71	3175	1358	7199	22386	1457.2	6.96%	1119	2577	14.18%	123.23%	6.07%	52.71%
1971/72	3765	1436	7983	27801	5414.2	24.19%	1390	6804	13.54%	55.33%	5.17%	21.10%
1972/73	4084	1520	8522	35213	7412	26.66%	1761	9173	11.60%	44.52%	4.32%	16.57%
1973/74	5485	1907	10955	41095	5882.6	16.71%	2055	7937	13.35%	69.10%	4.64%	24.03%
1974/75	7709	2306	14232	48091	6996.2	17.02%	2405	9401	16.03%	82.00%	4.80%	24.53%
1975/76	9213	2463	17003	61583	13491.6	28.05%	3079	16571	14.96%	55.60%	4.00%	14.86%
1976/77	11047	2753	19813	68413	6829.8	11.09%	3421	10250	16.15%	107.77%	4.02%	26.86%
1977/78	12118	3010	21549	73613	5200.7	7.60%	3681	8881	16.46%	136.44%	4.09%	33.89%

Sources: Reserve Bank of Australia, Australian Economic Statistics 1949-50 to 1994-95, Table 2.17 pages 92-93
R. H Scott, The Value of Land in Australia, Table 7a, p 28

Table 4: Australian Taxation Receipts compared to Land and Resource Values, 1910-11 to 1998-99 ($million)

	(1)	(2)	(3)	(4)	(21)	(24)	(25)	(27)	(30)	(33)	(35)	(36)	(37)
Fiscal Year	Total Australian Taxation	Total Taxation as % of GDP	Individual income tax	Company tax	Value of Land Resources	Current Yield	Accrual Yield	Total Smoothed Land Income	Personal Income tax as % of smoothed land income	Company tax as % of smoothed land income	Total Aust taxes as % of smoothed land income	Company and personal income tax as % of smoothed land income	Smoothed land income as % of company and personal income tax
	$m		$m	$m	$m	$m	$m	$m					
1910/11	44	6.49			862	43	17.0						
1911/12	51	6.92			914	46	18.0	63.7	0.0%	0.0%	79.9%	0.0%	
1912/13	53	6.61			958	48	18.9	66.8	0.0%	0.0%	79.5%	0.0%	
1913/14	55	6.40			980	49	19.3	68.3	0.0%	0.0%	81.0%	0.0%	
1914/15	56	6.68			1030	52	20.3	71.8	0.0%	0.0%	78.1%	0.0%	
1915/16	68	7.05			1048	52	20.6	73.0	0.0%	0.0%	93.7%	0.0%	
1916/17	67	6.58			1067	53	21.0	74.3	0.0%	0.0%	90.4%	0.0%	
1917/18	73	6.88			1096	55	21.6	76.4	0.0%	0.0%	95.7%	0.0%	
1918/19	91	7.98			1108	55	21.8	77.2	0.0%	0.0%	118.4%	0.0%	
1919/20	117	9.34			1132	57	22.3	78.9	0.0%	0.0%	148.5%	0.0%	
1920/21	149	10.78			1216	61	23.9	84.7	0.0%	0.0%	176.0%	0.0%	
1921/22	149	10.78			1297	65	25.5	90.4	0.0%	0.0%	164.5%	0.0%	
1922/23	155	10.26			1343	67	26.4	93.6	0.0%	0.0%	165.7%	0.0%	

	(1)	(2)	(3)	(4)	(21)	(24)	(25)	(27)	(30)	(33)	(35)	(36)	(37)
Fiscal Year	Total Australian Taxation	Total Taxation as % of GDP	Individual income tax	Company tax	Value of Land Resources	Current Yield	Accrual Yield	Total Smoothed Land Income	Personal Income tax as % of smoothed land income	Company tax as % of smoothed land income	Total Aust taxes as % of smoothed land income	Company and personal income tax as % of smoothed land income	Smoothed land income as % of company and personal income tax
	$m		$m	$m	$m	$m	$m	$m					
1923/24	161	10.29			1419	71	27.9	98.9	0.0%	0.0%	163.3%	0.0%	
1924/25	171	9.91			1500	75	29.5	104.5	0.0%	0.0%	163.3%	0.0%	
1925/26	180	10.85			1578	79	31.1	110.0	0.0%	0.0%	163.7%	0.0%	
1926/27	199	11.49			1665	83	32.8	116.0	0.0%	0.0%	171.3%	0.0%	
1927/28	201	11.57			1773	89	34.9	123.5	0.0%	0.0%	162.9%	0.0%	
1928/29	204	11.90			1862	93	36.6	129.7	0.0%	0.0%	157.1%	0.0%	
1929/30	209	13.36			1933	97	38.0	134.7	0.0%	0.0%	155.4%	0.0%	
1930/31	197	15.30			1954	98	38.5	136.2	0.0%	0.0%	144.7%	0.0%	
1931/32	196	16.18			1893	95	37.3	131.9	0.0%	0.0%	148.5%	0.0%	
1932/33	207	16.41			1713	86	33.7	119.4	0.0%	0.0%	173.8%	0.0%	
1933/34	202	14.93			1672	84	32.9	116.5	0.0%	0.0%	173.8%	0.0%	
1934/35	211	14.73			1636	82	32.2	114.0	0.0%	0.0%	185.1%	0.0%	
1935/36	232	14.76			1618	81	31.8	112.7	0.0%	0.0%	206.1%	0.0%	
1936/37	242	14.09			1630	82	32.1	113.6	0.0%	0.0%	213.1%	0.0%	
1937/38	264	14.22			1647	82	32.4	114.8	0.0%	0.0%	230.2%	0.0%	
1938/39	276	15.19			1686	84	33.2	117.5	0.0%	0.0%	235.3%	0.0%	
1939/40	318	16.06			1711	86	33.7	119.2	0.0%	0.0%	266.8%	0.0%	

Fiscal Year	(1) Total Australian Taxation	(2) Total Taxation as % of GDP	(3) Individual income tax	(4) Company tax	(21) Value of Land Resources	(24) Current Yield	(25) Accrual Yield	(27) Total Smoothed Land Income	(30) Personal Income tax as % of smoothed land income	(33) Company tax as % of smoothed land income	(35) Total Aust taxes as % of smoothed land income	(36) Company and personal income tax as % of smoothed land income	(37) Smoothed land income as % of company and personal income tax
	$m		$m	$m	$m	$m	$m	$m					
1940/41	364	16.94			1707	85	159.9	245.2	0.0%	0.0%	148.3%	0.0%	
1941/42	474	18.96			1729	86	161.9	248.4	0.0%	0.0%	190.7%	0.0%	
1942/43	567	19.84			1792	90	167.8	257.4	0.0%	0.0%	220.3%	0.0%	
1943/44	650	22.38			1807	90	169.2	259.6	0.0%	0.0%	250.5%	0.0%	
1944/45	749	26.37			1831	92	171.5	263.0	0.0%	0.0%	285.0%	0.0%	
1945/46	782	26.65			1930	97	180.7	277.2	0.0%	0.0%	282.2%	0.0%	
1946/47	863	27.64			2049	102	191.9	294.3	0.0%	0.0%	293.1%	0.0%	
1947/48	947	25.28			2219	111	207.8	318.8	0.0%	0.0%	297.2%	0.0%	
1948/49	1098	25.38			2418	121	226.4	347.3	0.0%	0.0%	316.0%	0.0%	
1949/50	1160	21.90	392	167	2758	138	258.3	396.2	98.9%	42.2%	292.8%	141.1%	70.9%
1950/51	1620	23.00	722	181	3219	161	301.5	462.4	156.1%	39.1%	350.3%	195.3%	51.2%
1951/52	2058	27.10	800	302	3578	179	335.1	514.0	155.7%	58.8%	400.4%	214.4%	46.6%
1952/53	2029	23.60	775	334	3856	193	361.1	553.9	139.9%	60.3%	366.3%	200.2%	49.9%
1953/54	2085	22.20	788	268	4388	219	410.9	630.3	125.0%	42.5%	330.8%	167.5%	59.7%
1954/55	2184	21.80	720	343	4885	244	457.5	701.7	102.6%	48.9%	311.2%	151.5%	66.0%
1955/56	2346	21.70	773	373	5321	266	498.3	764.4	101.1%	48.8%	306.9%	149.9%	66.7%

Fiscal Year	(1) Total Australian Taxation	(2) Total Taxation as % of GDP	(3) Individual income tax	(4) Company tax	(21) Value of Land Resources	(24) Current Yield	(25) Accrual Yield	(27) Total Smoothed Land Income	(30) Personal Income tax as % of smoothed land income	(33) Company tax as % of smoothed land income	(35) Total Aust taxes as % of smoothed land income	(36) Company and personal income tax as % of smoothed land income	(37) Smoothed land income as % of company and personal income tax
	$m		$m	$m	$m	$m	$m	$m					
1956/57	2588	22.00	807	432	5884	294	551.0	845.2	95.5%	51.1%	306.2%	146.6%	68.2%
1957/58	2758	22.90	870	429	6517.8	326	581.6	907.5	95.9%	47.3%	303.9%	143.1%	69.9%
1958/59	2736	21.10	777	437	7326.9	366	653.8	1020.1	76.2%	42.8%	268.2%	119.0%	84.0%
1959/60	3030	21.20	884	456	8168.3	408	728.8	1137.3	77.7%	40.1%	266.4%	117.8%	84.9%
1960/61	3408	22.40	1037	575	9363.8	468	835.5	1303.7	79.5%	44.1%	261.4%	123.6%	80.9%
1961/62	3458	22.20	1074	560	9933.0	497	886.3	1383.0	77.7%	40.5%	250.0%	118.2%	84.6%
1962/63	3564	21.20	1083	514	11616.0	581	1036.5	1617.3	67.0%	31.8%	220.4%	98.7%	101.3%
1963/64	3976	21.30	1271	580	12589.0	629	1123.3	1752.7	72.5%	33.1%	226.8%	105.6%	94.7%
1964/65	4620	22.50	1569	700	13902.4	695	1240.5	1935.6	81.1%	36.2%	238.7%	117.2%	85.3%
1965/66	5090	23.50	1729	791	14815.1	741	1321.9	2062.7	83.8%	38.3%	246.8%	122.2%	81.9%
1966/67	5464	22.90	1921	774	16980.4	849	1515.1	2364.1	81.3%	32.7%	231.1%	114.0%	87.7%
1967/68	6047	23.70	2175	823	18308.7	915	1633.6	2549.1	85.3%	32.3%	237.2%	117.6%	85.0%
1968/69	6760	23.50	2377	986	20200.4	1010	1802.4	2812.5	84.5%	35.1%	240.4%	119.6%	83.6%
1969/70	7742	24.30	2855	1122	22450.9	1123	2003.2	3125.8	91.3%	35.9%	247.7%	127.2%	78.6%
1970/71	8631	24.60	3175	1358	25811.3	1291	2303.1	3593.7	88.4%	37.8%	240.2%	126.1%	79.3%
1971/72	9863	25.10	3765	1436	34511.6	1726	3079.4	4805.0	78.4%	29.9%	205.3%	108.2%	92.4%

Fiscal Year	(1) Total Australian Taxation	(2) Total Taxation as % of GDP	(3) Individual income tax	(4) Company tax	(21) Value of Land Resources	(24) Current Yield	(25) Accrual Yield	(27) Total Smoothed Land Income	(30) Personal Income tax as % of smoothed land income	(33) Company tax as % of smoothed land income	(35) Total Aust taxes as % of smoothed land income	(36) Company and personal income tax as % of smoothed land income	(37) Smoothed land income as % of company and personal income tax
	$m		$m	$m	$m	$m	$m	$m					
1972/73	10819	24.20	4084	1520	39883.6	1994	3558.7	5552.9	73.5%	27.4%	194.8%	100.9%	99.1%
1973/74	13761	25.70	5485	1907	43204.4	2160	3855.0	6015.3	91.2%	31.7%	228.8%	122.9%	81.4%
1974/75	17774	27.50	7709	2306	55801.3	2790	4979.0	7769.1	99.2%	29.7%	228.8%	128.9%	77.6%
1975/76	21420	28.00	9213	2463	59979.7	2999	5351.9	8350.8	110.3%	29.5%	256.5%	139.8%	71.5%
1976/77	24906	28.40	11047	2753	66001.4	3300	5889.2	9189.2	120.2%	30.0%	271.0%	150.2%	66.6%
1977/78	27077	28.40	12118	3010	72395.6	3620	6459.7	10079.5	120.2%	29.9%	268.6%	150.1%	66.6%
1978/79	29543	27.20	12791	2943	91259.5	4563	8142.9	12705.9	100.7%	23.2%	232.5%	123.8%	80.8%
1979/80	34388	27.90	15033	3303	144215	7211	12868.0	20078.7	74.9%	16.5%	171.3%	91.3%	109.5%
1980/81	40566	28.80	17532	4579	174205	8710	15543.9	24254.2	72.3%	18.9%	167.3%	91.2%	109.7%
1981/82	47098	29.70	21205	4902	221300	11065	19746.1	30811.1	68.8%	15.9%	152.9%	84.7%	118.0%
1982/83	51729	30.00	22943	4693	242227	12111	21613.4	33724.7	68.0%	13.9%	153.4%	81.9%	122.0%
1983/84	56746	29.00	24671	4471	245200	12260	21878.7	34138.7	72.3%	13.1%	166.2%	85.4%	117.1%
1984/85	66313	30.50	29256	5497	279700	13985	24957.0	38942.0	75.1%	14.1%	170.3%	89.2%	112.1%
1985/86	73608	30.50	32673	6004	302600	15130	27000.3	42130.3	77.6%	14.3%	174.7%	91.8%	108.9%
1986/87	82995	31.30	38000	6573	357600	17880	31907.9	49787.9	76.3%	13.2%	166.7%	89.5%	111.7%
1987/88	94476	31.50	41811	8648	471500	23575	42070.9	65645.9	63.7%	13.2%	143.9%	76.9%	130.1%

Fiscal Year	(1) Total Australian Taxation	(2) Total Taxation as % of GDP	(3) Individual income tax	(4) Company tax	(21) Value of Land Resources	(24) Current Yield	(25) Accrual Yield	(27) Total Smoothed Land Income	(30) Personal Income tax as % of smoothed land income	(33) Company tax as % of smoothed land income	(35) Total Aust taxes as % of smoothed land income	(36) Company and personal income tax as % of smoothed land income	(37) Smoothed land income as % of company and personal income tax
	$m		$m	$m	$m	$m	$m	$m					
1988/89	106137	31.20	47433	10106	541700	27085	48334.7	75419.7	62.9%	13.4%	140.7%	76.3%	131.1%
1989/90	115408	31.10	49928	12784	585838	29292	52273.1	81565.0	61.2%	15.7%	141.5%	76.9%	130.1%
1990/91	119179	31.50	50156	14253	602102	30105	53724.3	83829.4	59.8%	17.0%	142.2%	76.8%	130.2%
1991/92	115627	29.90	46830	14091	581976	29099	51928.5	81027.3	57.8%	17.4%	142.7%	75.2%	133.0%
1992/93	118724	29.40	47528	14237	627330	31367	55975.3	87341.8	54.4%	16.3%	135.9%	70.7%	141.4%
1993/94	126146	29.60	50571	13477	675164	33758	60243.4	94001.6	53.8%	14.3%	134.2%	68.1%	146.8%
1994/95	139350	30.70	54635	16142	723875	36194	64589.8	100783.6	54.2%	16.0%	138.3%	70.2%	142.4%
1995/96	147827		60414	18252	738025	36901	65852.4	102753.6	58.8%	17.8%	143.9%	76.6%	130.6%
1996/97	159668		66453	19173	820648	41032	73224.7	114257.1	58.2%	16.8%	139.7%	74.9%	133.4%
1997/98	167919		70822	19406	887076	44354	79151.9	123505.7	57.3%	15.7%	136.0%	73.1%	136.9%
1998/99	177884		76728	20734	952908	47645	85025.9	132671.3	57.8%	15.6%	134.1%	73.5%	136.1%