Trickle-Up Economics

Assessing the impact
of privatized land rent
on economic growth

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Executive Summary

This report investigates the relationship of the land rent share of GDP with economic growth.

Since the Second World War, there has been a negative correlation between Australia's total land price and the rate of economic growth.

The public narrative focuses on wages losing out to the income flows to capital. Our analysis demonstrates how rapidly rising land prices have 'squeezed' both labour and capital.

Land reform is the key component to a fairer and smoother rate of growth, one where those at the lower end of the economic spectrum become key drivers of the economy.

Australia's valuation of land as a separate asset class is globally unique. Because of this, the impact of land prices on the economic cycle is often underplayed.

With land becoming increasingly commodified, the findings of the report are timely.

- The **economic rent** of land (rental value plus smoothed realized "capital gains") has increased from 2% of GDP in the early 1950s to more than 20% of GDP in 2017.

- The "Global Financial Crisis" and the recession of the early 1990s were preceded by notable squeezes on the percentage of GDP accruing to labour and capital, as distinct from land.

- An increase in land rent of 1% of GDP corresponds to a loss of 0.124% per annum in GDP growth.

- According to these correlations, *the gains of landowners do not "trickle down" to labour and capital.* On the contrary, there is a **"trickle-up"** effect: when labour and capital get a greater fraction of GDP, growth is faster, and the cumulative effect of that growth will eventually make landowners better off in *absolute* terms, although not in relative terms.

- *Since 2003, the economic rent of land has consistently exceeded 15% of GDP.* The extraction of this economic rent, no less than the extraction of taxes, is a drain on the capacity of workers and employers to invest in future growth.

- Taxes that improve the competitive position of tenants and land buyers relative to landlords and sellers — such as land-value taxes, and vacancy taxes (applicable to both bare land and vacant accommodation) — have **negative deadweight**.

- In order to maximize growth, we must minimize rent extraction by maximizing the bargaining power of labour and capital relative to land.

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Introduction: Jobs and Growth

Between 2016-17 and 2020-21, Australia's federal tax revenue as a fraction of national income is forecast to rise by 2.5 percentage points, while federal spending is forecast to be cut by 0.5 percentage points (according to the 2017-18 budget papers). In other words, "budget repair" is to be five parts extra revenue and only one part spending cuts. Most of the extra revenue is supposed to come through bracket creep in personal income tax, with middle-income earners bearing the brunt; and most of the bracket creep is supposed to come from economic growth (Richardson, 2017). The bottom line is that *budget repair depends on growth*.

And what policies are supposed to encourage that growth? The proposal getting all the attention is to cut the company tax rate from 30% to 25%, with smaller companies higher in the queue than larger ones. We are repeatedly told that this is necessary because people are more likely to invest if they don't have to pay so much tax on their profit. But at least company tax is not payable unless the company actually makes a profit. The same cannot be said for the rents and prices that companies pay for their business premises. A cost that you incur up front, whether you make a profit or not, is surely a *greater* disincentive than one that you incur only if you make a profit, and which takes only *part* of the profit. To say nothing of the *residential* rents or mortgages that prospective investors must pay before they can invest any of their limited income in companies! But when did you last hear that we have to cut the cost of commercial and residential accommodation in order to encourage investment? Indeed, where and when did you *first* encounter that idea? Probably right here and now!

The same conclusion follows from the most basic considerations of the economics of employment. If we want more jobs, employers must be able to pay for business accommodation out of their gross revenue, and employees must be able to pay for living space within commuting distance of the premises, on wages that the employers can also pay out of their gross revenue. More expensive real estate obviously makes it harder to meet these simultaneous requirements.

Having heard the theoretical reasons why high rents and mortgages should be worse than high company taxes, one might reasonably ask whether there is any statistical evidence to support the theory and, if so, how much scope there is for boosting economic growth through cheaper real estate.

The Wages-and-Profits Squeeze

In the year to June 2017, the real increase in the market value of Australia's residential, commercial and rural land was more than three times the federal welfare budget, and more than 40 times the budgeted expenditure on unemployment and sickness benefits. The **economic rent** of land (rental value plus smoothed realized "capital gains") has increased from 2% of GDP in the early 1950s to more than 20% of GDP in 2017.

Since the Second World War, *there has been a negative correlation between Australia's total land price (in years' GDP) and the rate of economic growth, and a corresponding positive correlation between the return to labor and capital (as a fraction of GDP) and the rate of economic growth.* A simple regression analysis indicates that since 1996, the growth in the total land price (in years' GDP) is associated with a cumulative forgone economic growth of 13%.

The "Global Financial Crisis" and the recession of the early 1990s were preceded by notable squeezes on the percentage of GDP accruing to labour and capital, as distinct from land.

According to these correlations, *the gains of landowners do not "trickle down" to labour and capital.* On the contrary, there is a **"trickle-up"** effect: when labour and capital get a greater fraction of GDP, growth is faster, and the cumulative effect of that growth will eventually make landowners better off in *absolute* terms, although not in relative terms. According to the same correlations, taxes that improve the competitive position of tenants and land buyers relative to landlords and sellers — such as land-value taxes, and vacancy taxes (applicable to both bare land and vacant accommodation) — have **negative deadweight.**

Theory suggests that the fixed supply of land, together with the absolute necessity of access to land for both shelter and sustenance, will raise the price of access until it absorbs capacity to pay. The persistence of housing stress in spite of the growth in capacity to pay validates theory. All taxes, together with their deadweight costs, reduce that capacity to pay and therefore reduce land rents. In summary, "all taxes come out of rent" (ATCOR) and "excess burdens come out of rent" (EBCOR). Similarly, a tax *cut*, by increasing capacity to pay, will be converted into higher land rents. Hence, if taxes are nominally removed from labour and capital and imposed on land, the net benefit to labour and capital is *not* simply the reduction in tax paid, but rather the positive effect of the tax reform on the bargaining power of labour and capital relative to land.

Since 2003, the economic rent of land has consistently exceeded 15% of GDP. The extraction of this economic rent, no less than the extraction of taxes, is a drain on the capacity of workers and employers to invest in future growth. This implies, and the above correlations confirm, that *in order to maximize growth, we must minimize rent extraction by maximizing the bargaining power of labour and capital relative to land*.

The *equity* of taxing the economic rent of land, rather than the returns to labour and capital, has long been defended on the ground that economic rent is unearned. When we further consider that the benefit thus conferred on labour and capital is competed away in higher rents (except the benefit of the improved bargaining position of labour and capital relative to land), that the government receiving the revenue gains has an incentive to invest in infrastructure for the benefit of landowners, and that the greater fraction of GDP going to labour and capital eventually enriches landowners through faster economic growth, landowners should have no reason to oppose reform.

The Distribution of GDP by Factors of Production

Quantifying the rent

Land is not a product of human effort, let alone private or competitive effort. From the *micro* viewpoint (the viewpoint of the individual or firm), land has a cost of access or acquisition. But from the *macro* viewpoint (the viewpoint of society), land is a free gift of nature, absolutely inelastic in supply. It is the **passive factor** of production, to which the **active factors** (labour and capital) must compete for access; and that competition gives land a market value. The active factors add further value to a particular piece of land (as distinct from any structures built on or under the land), *not* by producing the land, but by adding to the *locational advantage* of that land through their activities on *other* land — a process to which the owner of the first-mentioned land, *as owner,* makes no contribution. Thus the total return on one piece of land (comprising current rent and "capital gains"[1]) is not a cost of production, but a **surplus** (or "**economic rent**").

That a particular piece of land has been **purchased** or **mortgaged** has implications concerning who receives or has received its economic rent, but does not eliminate the rent. For example, if an investment property is heavily mortgaged, most of the economic rent flows *through* the investor to the financiers. Similarly, **owner-occupancy** of land does not reduce the economic rent or make it less real, just because the owner and the occupant are the same; if it did, nobody would want to be an owner-occupant. The economic rent of owner-occupied land, including the annual rental value ("**imputed rent**"), still accrues to (or through) the owner-occupants in their capacity as owners; and again, if the land is heavily mortgaged, most of the rent flows to the financiers. These circumstances are obviously relevant for some purposes; for example, if one wanted to impose a tax on the economic rent of land, in order to remove taxes on costs of production, one would obviously need to determine who actually receives the rent. But for the purpose of merely *quantifying* the rent, such circumstances can be ignored.

At face value, the unearned "capital gains" on land are staggering. In the year to 30 June 2017, Australia's landowners saw their assets rise in value by about $482 billion, net of general inflation (ABS 5204.0, Table 61). That is more than three times the budgeted federal expenditure on "social security and welfare" for the same period (Australian Treasury, 2016:25), and more than 40 times the budgeted expenditure on sickness and unemployment benefits, including Newstart (the 6% of the "social security and welfare" bill that gets nearly 100% of the attention). Those "capital gains", however, were *accrued* rather than realized, and could not have been simultaneously realized without crashing prices. And of course the latest year's figures are not necessarily sustainable. To draw firmer conclusions, we need to study *realized* gains over a long period.

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[1] The term "capital gain" is in quotation marks because it is a misnomer: in the long term, and usually even in the short term, true capital (that is, produced capital) does not gain; it depreciates.

Sources and methods

In the graphs that follow, the total land value (from which the rental value is calculated at an assumed yield of 5% per annum) is the total price of residential, commercial and rural land. Values for 1989 onward are from the Australian Bureau of Statistics (ABS 5204.0, Table 61). Earlier values were compiled by Dwyer (2003, Table 4), citing Scott (1969, 1986) and Herps (1985, 1988).

Dwyer's figures for 1980–83 rely on proportionalities between urban and rural values and (less importantly) between the total for the six States and the total for the Territories. His figures for 1984–88 are from ABS 5241.0, 1995, Table 3.2 (p.31).

The assumed land turnover rate, namely 6% per annum by value, is representative of Australia's "dwelling turnover rate" (the ratio of annualized dwelling turnover to estimated dwelling stock) for 1995 through 2010 (RBA, 2011, Graph 3.6).

The time for which the resold land is assumed to have been held, namely 8 years, is slightly shorter than the average for dwellings sold in 2012, but slightly longer than the average for dwelling sold in 2002 (RP Data, 2013). These assumptions are made partly for want of more detailed data, and partly in order to smooth out the realization (cashing in) of "capital gains". Together they imply that only 48% of the land (by value) ever turns over — making a rough allowance for the fact that not all land changes ownership at the same frequency.

For the purpose of calculating real "capital gains", the cost base is adjusted in proportion to an ABS CPI sequence obtained by splicing the "CPI - long-term price series" up to 2000 (ABS 1301.0, 2002) with the standard CPI series for the June quarter (ABS 6401.0, Tables 1&2, series ID A2325846C).

From 1960 onward, the total tax and total GDP are from ABS 5206.0, Table 22 (series ID A2301963V) and Table 1 (series ID A2302467A).

Up to 1959, the total tax and the tax/GDP ratio are from Dwyer (2003), citing Vamplew (1987, Table GF1-7, p.256) and RBA (1996, Table 2.8). Dividing the total tax by the tax/GDP ratio yields an "**implied GDP**". For total tax, the Dwyer and ABS figures overlap from 1960 to 1999, and the discrepancies are within ±5%. Dwyer's implied GDP and the ABS's GDP overlap from 1960 to 1995, and the ABS figures are consistently higher, the biggest discrepancy being 16% for 1960.

For want of better information, the higher values of newer GDP figures are attributed to improved methodology, and the older "implied GDP" figures are scaled up so that they match the ABS figures at 1960. This decision seems to be vindicated by Figures 1 and 4 (below), which show no discontinuity in the tax share of GDP between 1959 and 1960 (that is, between 1959.5 and 1960.5 on the horizontal axis); if the "implied GDP" had not been scaled up, the tax share prior to 1960 would be higher by about 16% (not to be confused with 16 percentage points).

In the graphs, the share of GDP flowing to labour and "capital" is not calculated directly, but is treated as a residual. As an example of the implications and limitations of this method, consider banking, whose core business (at least in Australia) is lending against real estate. In the case of a lightly geared buyer, the interest may take less than the rental value of the land alone. In the case of a new negatively-geared buyer, the interest takes the full rental value of the land plus buildings, plus some or most of the *unrealized* capital gain. The part of the interest that accrues to the banks is not the gross interest, but the interest *margin*, and some of that is taken by expenses other than interest. We may still say that the gross interest accrues more broadly to the "financiers", meaning the banks and their depositors, bondholders, employees, suppliers, etc. But in the graphs, land rental values and smoothed realized "capital gains" are pre-emptively classified as economic rent before the banks see them, and the remainder of the economic rent flowing through banks (from land *or other land-like assets*) is consigned to the light blue band as if it were a return to labour and capital.

The exclusion of unrealized "capital gains" from the estimate of economic rent is a departure from the methodology of Dwyer (as graphed by Kavanagh, 2007, Fig.1, p.6). Dwyer's approach does not consider realization, but attempts to "level out a growing annuity" (Dwyer, 2003:55), the "growing" annuity being the rental value of land. If the resulting "level" annuity were the sole source of public revenue, it would prevent real revenue from growing with real GDP — to the delight of libertarians, undoubtedly, but flying in the face of history.

The negative correlation between the land-value-to-GDP ratio and economic growth is particularly robust; the sign of the correlation has survived all experiments with the spreadsheet underlying the graph, including not only variations in the length of the timeline, but also the use of 3-year smoothing instead of 8-year smoothing, and the use of more data points in the correlation when permitted by a smaller lag.

Economic rent of land in Australia, as a fraction of GDP

Figure 1 shows how the estimated economic rent of land in Australia, as a fraction of GDP (left-hand scale), has varied over the last 106 years.
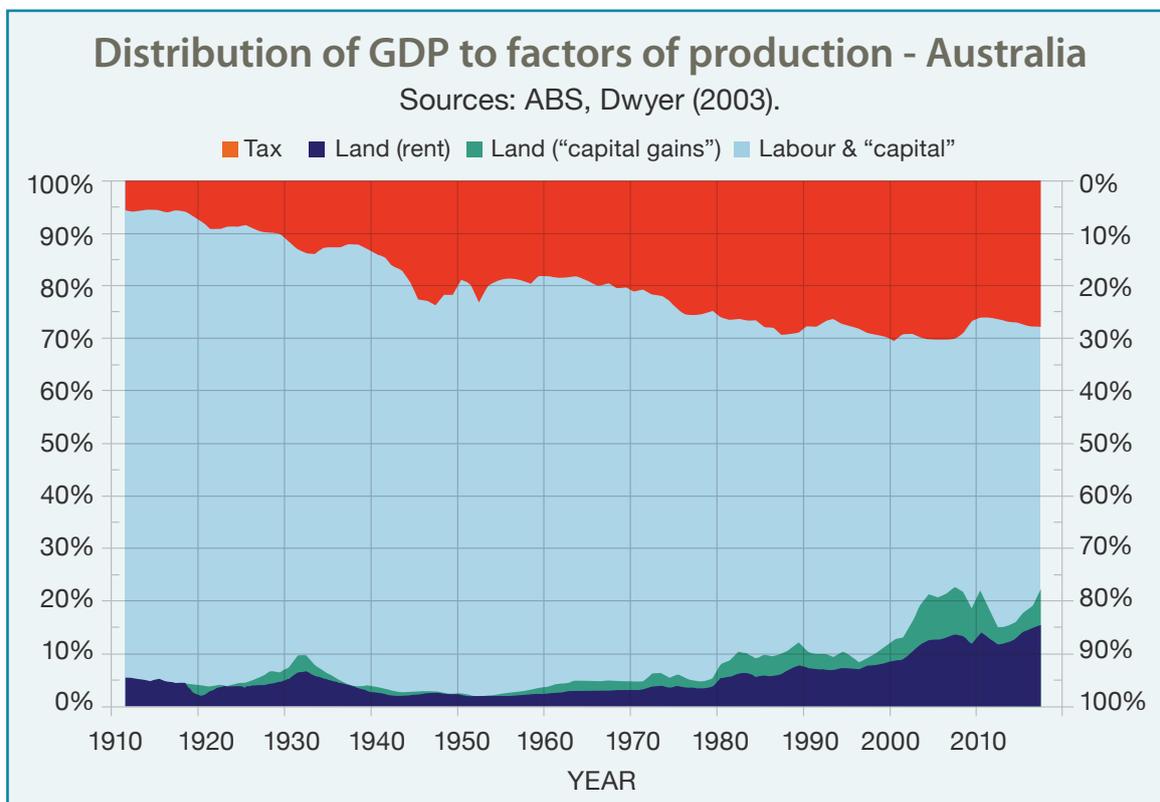

Figure 1: Estimated After-Tax Distribution of GDP

On the time axis, the "year" means the "financial year ended". The dark blue band (including the aqua-coloured segments) shows the rental value, assuming a yield of 5% per annum. The green band shows the real "capital gains", assuming that 6% of the land value is sold each year, having been bought 8 years earlier; hence no "capital gains" are shown for the first 8 years. Where green gives way to aqua (1919–22, 1938–49), the "capital gains" are negative, so the rental value is indicated by the *top* of the aqua band (on the left-hand scale), while the "rent plus capital gain" is indicated by the bottom of the aqua band. The red band shows tax for all levels of government as a fraction of GDP (inverted right-hand scale). The light blue band — the meat in the sandwich — shows what is left for labour and "capital".

Assessing the impact of privatized land rent on economic growth

The quantification necessarily involves approximations. Most obviously, "capital" is in quotation marks because it wrongly includes assets other than *terra firma* which are **land-like**, in the sense that they are in perfectly inelastic supply. [This is done for want of data on the historical values of such assets; but *recent* values are taken into account by Fitzgerald (2013).] The excessively wide scope of "capital" tends to overstate the share of GDP accruing to the active factors of production (labour and capital). This tendency is partly offset by failing to allow for the incidental capture of land rents and "capital gains" through the income-tax system, which cuts into the share of GDP taken by land. The degree of "incidental capture" is less than would be suggested by nominal rates of income tax, for three reasons:

I.   imputed rents are not explicitly assessed and are taxable only to the extent that they are realized or disguised as assessable income;

II. "capital gains" on owner-occupied residential land, and on all assets acquired before 1985, are exempt, and

III. "capital gains" on assets acquired by individuals after 1985 have always received concessional treatment (5-year "averaging" before 1999, and discounting thereafter).

It should be acknowledged that recent dwelling turnover rates have been considerably lower than the assumed 6% per annum. However, these rates have attracted attention precisely because they are historically unusual (Scutt, 2017).

Figure 1 shows that the "Global Financial Crisis" closely followed the highest-ever peak in the economic rent of land and the worst-ever squeeze on labour and "capital", and that the recession of the early '90s closely followed an earlier double record of the same kind.

Before leaving this graph, we should explain its apparent disagreement with the ABS labour share. In the few years before the crisis of 2008, the combined share of GDP flowing to labour and "capital" according to Figure 1 (less than half) was similar to labour's share *alone* according to ABS figures (cf. Stanford 2017), so that Figure 1 assigns a much lower share to labour than the ABS does. The difference arises because the ABS figures are based on *gross* compensation of employees, and do not account for the portion of wages and salaries that employees must hand over to rent-takers in order to live within reach of employment. Likewise, if one were to regard the ABS's non-labour share of GDP as the capital share, one would wrongly classify a portion of economic rent, including the "extractive" incomes of finance and real estate, as part of the return to capital.

The present tax code makes some effort to avoid the latter error, but not the former. If you run a business on rented premises, the law recognizes the rent as a business expense to be deducted from taxable income. But if you live in a rented house and work for a living, the law refuses to admit that some of your rent is paid in order to live within reach of employment, rather than in a cheaper location where there are no available jobs.

Economic growth vs. the Land-rent-to-GDP ratio

For a more systematic and less anecdotal analysis, let the land-rent-to-GDP ratio (calculated as above) be averaged over the last 8 years, and correlated with inflation-adjusted GDP growth over the last 8 years, with various lags, for final years 1955 to 2012 (in order to exclude periods of global war).

The resulting correlation coefficient is shown by the blue curve in Figure 2 (below). If we add the "capital gain" to GDP ratio (calculated as above) to the averaged rent/GDP ratio, the resulting correlation is as shown in green. If we repeat the exercise for the "labor plus capital" share, the correlation is as shown in black. The implications are stark: Higher returns to land (including or excluding "capital gains") are associated with slower economic growth, whereas higher returns to "labour and capital" are associated with faster economic growth.

Correlation: Australian 8-yr Real GDP Growth vs...

Legend:
- ‘Wages & profits’ / GDP †
- Rent/GDP + CG/GDP ‡
- Rent/GDP

† 8-yr rolling average of fraction.

‡ Real CG, asuming 6% of land by value is sold each year, having been held for 8 years.

Timeline begins: 8 yrs to 1955. Timeline ends 8 yrs to 2012.

X-axis: GDP growth lagging by ... (years)
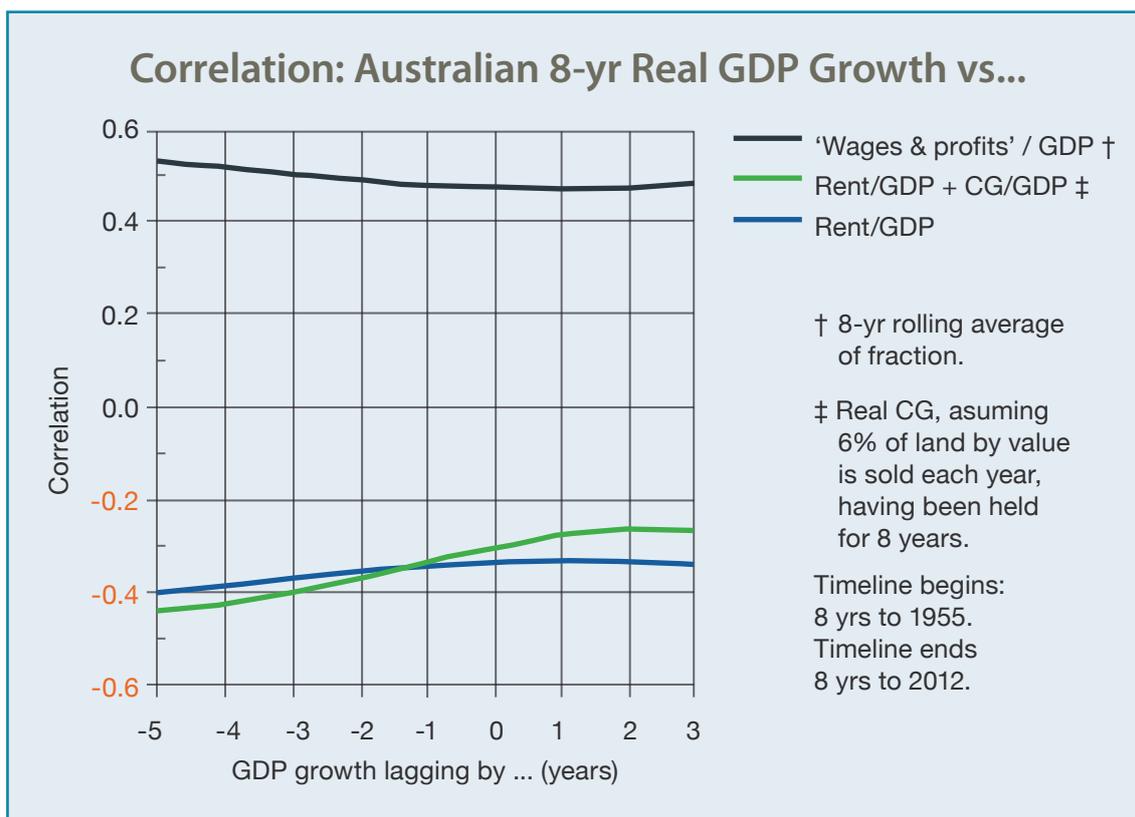Y-axis: Correlation

Figure 2: Correlation of Australian GDP growth to various shares of GDP.

The negative correlation between real GDP growth and the ratio of land rent to GDP is confirmed by a simple regression (*not* shown above). If the real GDP growth over the last 8 years is annualized (like compound interest) and plotted against the estimated rent/GDP ratio (at 5% yield with 8-year smoothing), the slope of the regression line is −0.124 (standard error 0.049). So an increase in land rent of 1% of GDP corresponds to a loss of 0.124% per annum in GDP growth. In capitalized terms, an increase in land price of one year's GDP corresponds to a loss of 0.62% per annum in GDP growth. *Higher land prices are associated with lower growth.*

This result is consistent with our initial reasoning: the more producers must pay in rents or mortgages, simply in order to exist, the less remaining capacity they have to invest in future production. One might argue that landowners can invest their economic rents in future production. But that is betting against the form guide: on past form, successful producers will invest their gains in further production, while successful rent-seekers will invest their gains in further rent-seeking.

One might further argue that higher land prices create demand through the wealth effect. But that is a bait-and-switch: the wealth effect is the correlation between the rate of change in land prices and the size of the economy, whereas the correlation asserted here is between land prices and the rate of change in the size of the economy.

Using the slope of the regression line, we can pick a base year — say 1996 — and convert the increase in rent/GDP since the base year to a loss of annual GDP growth, and thence estimate the cumulative loss of GDP growth since the base year. By this method, we estimate that if the rent/GDP ratio had flatlined from 1996 onward, GDP for the year 2016-17 would have been 13% higher than it was.

By way of comparison, it has been estimated that GDP growth from the proposed cut in company tax would be "0.2 per cent over the next decade or so" (Massola & Bagshaw, 2017). And the defenders of the Trans-Pacific Partnership (TPP) expect us to be impressed because it would allegedly make the economy 0.5% bigger by 2030 (Keane, 2018).

The trickle-*up* effect

The above correlations contradict any suggestion that the economic rent of land might "trickle down" to the providers of labour or capital. If the returns to land, labour, and capital are expressed as fractions of GDP, the landowners' share of the pie not only comes at the immediate expense of the labour/capital share, but also reduces the rate at which the whole pie grows over time, compounding the losses suffered by labour and capital.

On the contrary, the above correlations indicate that a reduction in the economic rent of land *as a fraction of GDP* would eventually lead to an increase in rent in *absolute* terms, because the cumulative effect of faster *growth* in GDP would eventually outweigh the landowners' smaller *fraction* of GDP. Of course, the absolute increase in "wages and profits" would be greater, because "wages and profits" would be a bigger fraction of a bigger economy.

In other words, if a policy causes an increase in the fraction of GDP flowing to labour and capital, the benefit will eventually trickle *up* to landowners through faster growth in GDP.

In summary, an increased share of GDP flowing to land does not trickle down to labour and capital; but an increased share flowing to labour and capital *does* eventually trickle up, in absolute terms but not relative terms, to land. Perhaps landowners should wait for the trickle-up, as workers have been expected to wait for the trickle-down.

Assessing the impact of privatized land rent on economic growth

Tax reform for economic growth

"All Taxes Come Out of Rents" (ATCOR) & "Excess Burdens Come Out of Rents" (EBCOR)

The correlation between the returns to labour and capital and overall economic growth is not the only mechanism by which those returns trickle *up* to landowners. A principle follows from the commonplace observation that the price of access to land tends to absorb capacity to pay. As Gaffney (2009) puts it, "All Taxes Come Out of Rents" (**ATCOR**), and "Excess Burdens Come Out of Rents" (**EBCOR**).

Because land is a finite resource, and because access to land is essential to economic participation, the price of access tends to absorb the capacity (or perceived capacity) to pay, wherever that capacity may come from. One can even get the impression that policies adding to that capacity — such as Commonwealth rent assistance, capital-gains discounting, first home owners' grants/boosts, and cuts in official interest rates — are advocated and adopted precisely *because* they are competed away in higher prices of access to land, as illustrated in Figure 3 (below). Capital-gains discounting began in 1999, leaving sellers with more money to reinvest and increasing the attractiveness of negative gearing. The first home owners' grant was supplemented in early 2001 and late 2008. The RBA's cash rate has fallen 3.25 percentage points since mid 2011. Other examples of such "demand-side" policies include stamp-duty concessions for first home buyers, tax concessions for saving a deposit, and shared-equity schemes (cf. Daley, Coates, & Wiltshire, 2018:135–42).

Total Price of Residential Land / Total Annual Wages & Salaries
AUSTRALIA (ABS 5204.0 Tables 6, 61)

Figure 3: Total price of residential land to total wages and salaries

Indeed, the persistence of housing stress in the age of the two-income household, in spite of (usually) rising real wages and falling real construction costs, is inexplicable unless the gains are absorbed by rising ground-rents. The unaffordable ingredient of housing is not the houses themselves, but the *space* ("land") that they occupy.

If the price of access to land absorbs the capacity to pay, the price is reduced by anything that reduces the capacity to pay, *including taxation of all kinds*. This reasoning applies not only to the tax payments themselves, but also to their excess burdens. Classical philosopher John Locke (1691) explained the ATCOR mechanism in these terms:

> It is in vain in a country whose great fund is land to hope to lay the publick charge of the Government on anything else; there at last it will terminate. The merchant (do what you can) will not bear it, the labourer cannot, and therefore the landholder must: and whether he were best to do it by laying it directly where it will at last settle, or by letting it come to him by the sinking of his rents,... let him consider.

Locke went on to assert that even where the great fund appeared to be trade, as in Holland, taxes on trade were borne by landowners.

Size of the rent share

The tendency of ground-rents to devour the fruits of economic progress was well understood by the American social philosopher Henry George (1879, III.ii.11), who popularized the idea that the rent of land was the proper source of public revenue. Mainstream economists reacted to George, in part, by understating the size of the rent fund. Industrialization and urbanization became excuses to claim that land values were of declining importance, as if houses and factories and commercial buildings did not occupy land, or as if the growth of secondary industries did not increase the capacity to pay for such occupation. Ely (1927:131) laid it down as a "formal definition" that *"with increasing wealth and stationary population, land values will decline"* (quoted in Gaffney, 1994:68, with Ely's italics). Even Scott (1986:38), to whom the present work is heavily indebted, remarked that "A declining share for the value of land in the national wealth is to be expected from a growth of other assets" (quoted by Dwyer, 2003:29–30). Heilbroner (1980:186–7) seemed to exclude owner-occupied land when he concluded: "Suffice it to point out that rental income in the United States has shrunk from 6 percent of the national income in 1929 to less than 2 percent today." Authors of more recent undergraduate texts, such as Case & Fair (1994:559), Krugman & Wells (2006:283), and Buchholz (2007:86), have claimed that rent in the USA is one percent of GDP or less.

If the last claim were true, it would not be a valid argument against the public collection of as much rent as possible, in order to minimize taxation of labour and capital. But the claim lacks credibility. In 2006 there were about 125 million homes in the USA (Kendall, 2008). Assuming that the average value was $250,000, of which 50% was land value, we find that total value of residential land alone was more than $15 trillion, or about a year's GDP. [A 50% land-value fraction is conservative because about half the buildings were more than 35 years old (Kendall, 2008) and therefore contributed little to the resale value, while the rest were in various stages of depreciation.] So, if 70% of the total land value was residential, the total land value was about 1.4 years' GDP. At a rental yield of 5% per annum, the annual rent would have been 7% of GDP. A more sophisticated study, based on sales of land (without structures) for the years 2005 to 2010, found that the ratio of the total *urban* land value to GDP bottomed at 1.26 in 2009 (Albouy, Ehrlich & Shin, 2017:1–2,14). At the same yield of 5% per annum, the annual rent of urban land alone would have been 6.3% of GDP. These estimates do not include "capital gains". Nor do they account for other "land-like" assets, including natural resources and government-created privileges (cf. Gaffney 2009; Fitzgerald 2013). Even so, they are comfortably above Heilbroner's 2% and the textbooks' 1%.
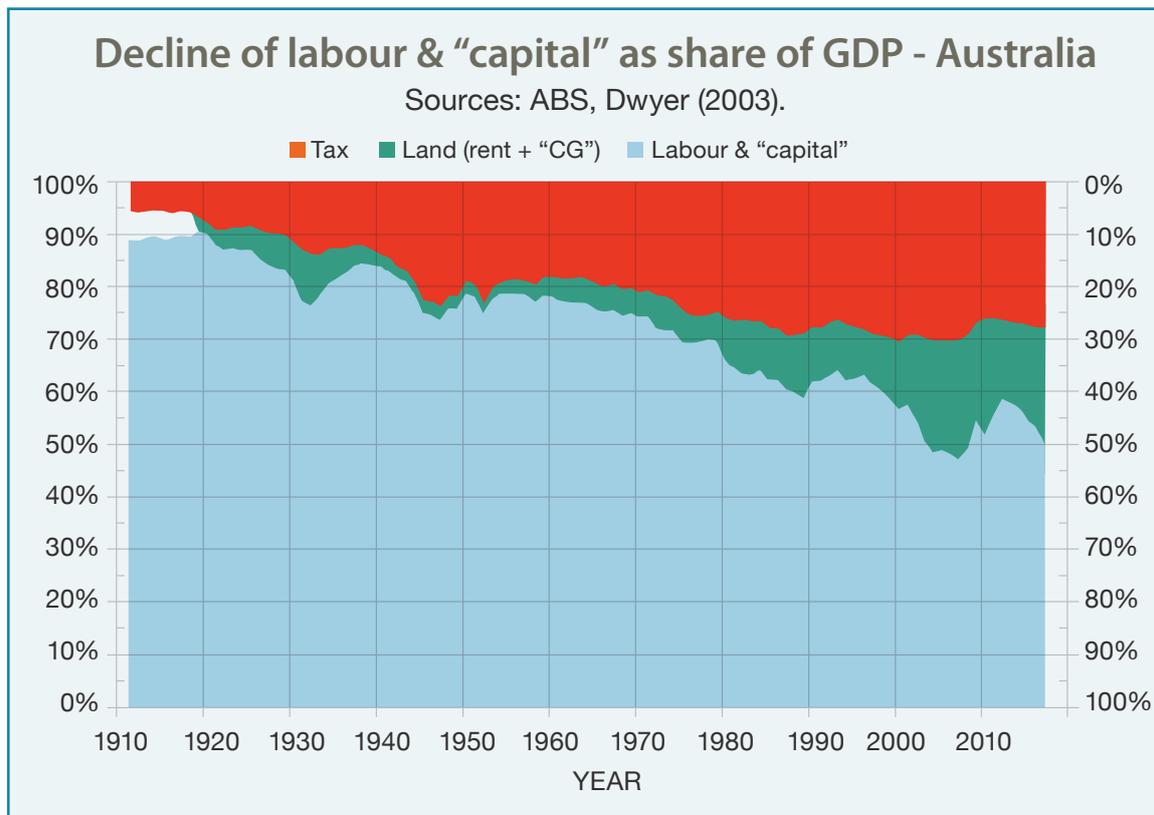
All-devouring rent

Figure 4: Distribution of GDP to factors of production (bottom band: labour & "capital")

Figure 4 shows the same information as Figure 1, except that the estimated rent and "capital gains" on land are lumped together in a single band (dark green) and stacked with the tax band (red). Because "capital gains" are based on an 8-year holding time, they are calculated for the 9th year onward; for the first 8 years, the white gap shows the estimated rental value only.

At first sight, it might seem that if the total return on land were taken as public revenue in lieu of taxes on labour and capital, then the dark green band would be absorbed into the red band, in which case the light blue band would expand to displace the dark green. But to argue thus is to forget the ATCOR principle, according to which the additional returns to labour and capital would be competed away in higher returns to land! If that is *not* to happen, the intensity of competition for land must be reduced. Hence, if taxes on the economic rent of land increase the returns to labour and capital, they do so not because of the revenue they raise, but because of their effect on competition for land.

Effects of past tax reforms

Let us consider how *past* tax reforms may have influenced land's share of GDP. We might wonder whether the effects of can be seen in past variations of land prices over time.

At least three complications might mask these effects. First, because buyers and sellers of property respond not only to prices but also to price *trends*, the land market acquires a momentum of its own and is subject to boom-bust cycles. In Figure 1, those who argue for an approximate 18-year cycle (cf. Harrison 2005, Anderson 2008) will discern end-of-cycle peaks circa 1973, 1989 and 2007, and mid-cycle peaks circa 1983 and perhaps 2017 (the mid-cycle event of 2000 being not in the land market, but in the stock market: the dotcom bubble). Second, if the price of access to land absorbs capacity to pay, it will reflect all economic conditions affecting that capacity, notably including the terms of trade, interest rates, and availability of credit. Third, according to the ATCOR theory, the capacity to pay for access to land, hence the price of access, is reduced by taxes in general, not only by taxes on land. Hence the variation in land values over time is not what one would expect if one considered only the tax arrangements pertaining to land.

Three examples may suffice to make the point:

- By itself, the abolition of the federal land tax in 1953 would have made property a more attractive investment. The land-price-to-GDP ratio indeed bottomed in 1952-3 (Figure 1), but the recovery was only *gradual*. Part of the explanation may be the post-Korean-War fall in the wool price, which reduced the income available for rents and mortgages.

- The discounting of "capital gains" for tax purposes from 1999 is often blamed for the subsequent surge in "house" prices. Theory supports that explanation (cf. Putland 2015), but also suggests that the introduction of the capital-gains tax in 1985 should have had a corresponding negative impact, as should the quarantining of negative gearing from 1985 to 1987. Yet there was little change in the measures of land rent over that period. Part of the explanation may be that the reforms of 1985 included (and were largely motivated by) substantial cuts in personal income-tax rates, so that wage/salary earners had more after-tax income with which to pay rent and service mortgages.

- The Whitlam government greatly expanded federal assistance to local governments, from $7.5 million in 1972-3 to $165 million in 1975-6 (Megarrity 2011), a difference of about 0.2% of GDP to be deducted from council rates and/or spent on infrastructure and services. This advantage should have been capitalized in land values in the affected locations. Land values indeed show a very slight peak in 1976 (Figure 1). But, in view of the much larger cyclic swings in land values, the overall increase in tax receipts during the same period, and the political uncertainties of 1974 and '75, there could be many a slip between the supposed cause and the supposed effect.

This is not to deny that the effect of a particular tax reform on land values can be predicted, but rather to assert that the cause may be diluted, making the effect difficult to discern.

It is arguable that the effects of some *non*-tax measures are more easily discerned because the measures are more easily adjusted until they have the desired effects. For example, one can see the upward acceleration in land prices in 2002 and 2009, presumably due to temporary supplements to the First Home Owners' Grant (cf. Daley, Coates, & Wiltshire, 2018:136), and again after 2013, undoubtedly assisted by interest-rate cuts.

Capacity of the land base

In Australia, as the preceding graphs show, only once (circa 1952) was the rental value of land as low as 2% of GDP, and only three times (circa 1952, 1943, and 1920) was the total return (rent plus "capital gains") that low. The graphs also show that land rents as a share of GDP have generally *increased* over time, especially since the Second World War: the total return on land has risen from 2% of GDP in the early 1950s to more than 20% in 2017.

The revenue that can be raised from a proposed tax base depends not only on the initial size of its base, but also on how much the base would shrink due to the deadweight cost of the tax, and on how much the base would expand due to the associated reductions in *other* taxes with their attendant deadweight costs.

Considering only that the economic rent of land is *not* a cost of production, one would conclude that a tax on that economic rent has zero deadweight. If there is a further mechanism by which the tax induces productive activity, the deadweight becomes *negative*. This is the case, for example, with a land-value tax, which induces owners to seek tenants in order to cover the tax liability. It is also the case with any tax on uplifts in land values (e.g. due to infrastructure), insofar as the prospective revenue motivates the government to invest in infrastructure, which in turn reduces transaction costs, leading to gains from trade (the conventional pro-free-trade argument, whose applicability is not limited to *international* trade). The downside is that if the value-capture tax is payable only on resale — which may be a political necessity — it will generate some deadweight by delaying resales. But this can be compensated: whereas most taxes generate deadweight by penalizing production while exempting failure to produce, a tax that does the opposite — e.g., a properly designed vacancy tax — has negative deadweight. By an appropriate selection of the foregoing measures, Australia could tax the economic rent of land in a way that causes zero or negative deadweight, instead of taxing other bases in ways that cause positive deadweight.

By itself, the ATCOR principle — that all taxes come out of rent — would imply that if existing taxes were abolished, the resulting *increase* in the economic rent of land would equal the forgone revenue. Hence, by taxing that economic rent, one could replace the forgone revenue, leaving the *after*-tax economic rent as it was before. The *existing* economic rent can therefore be understood as a margin for error: it is the margin by which the additional rent generated by abolition of taxes can fall short of the revenue from those taxes, while still leaving enough rent to replace existing revenue.

Whether the *existing* economic rents from *all* monopoly holders are sufficient to replace existing taxes, without assistance from the ATCOR effect, is a different question, and is examined by Fitzgerald (2013).

For more than a century, the economic rent of land has been less than tax revenue. In that situation, the fraction by which the rent falls short of tax revenue is the fraction of tax revenue that must be converted into additional rent on abolition of the taxes, if the resulting total rent is to be enough to replace the taxes. In other words, the fraction by which the economic rent of land falls short of tax revenue is the necessary "success rate" of the ATCOR principle if the resulting economic rent is to be an adequate tax base. Since 2003, that fraction has been less than half. In the early 1950s, it briefly exceeded 90%.

Even such a high fraction as 90% looks easily achievable in view of the EBCOR principle: that not only the taxes but also their excess burdens (deadweight costs) come out of rent, and are therefore *added to* rent if the taxes are abolished. An increase in rent equal to (say) 90% of revenue is a lesser fraction of revenue-plus-deadweight.

How to increase the returns to labour and capital

Because the benefits of lower taxes and lower excess burdens tend to be competed away in land rents (the ATCOR/EBCOR mechanism), the net benefit to labour and capital depends on reducing the intensity of that competition.

For example, replacing a sufficiently wide range of existing taxes by a land-value tax would make it uneconomic to own vacant land and buildings, so that owners would be forced to build accommodation and seek tenants (or sell their land to someone who will). The same land-value tax, unlike the other taxes that it would replace, would *not* penalize the said building and letting of accommodation. Thus a land-value tax would strengthen the bargaining positions of tenants and buyers relative to landlords and sellers. *Therein lies its real effect on returns to labour and capital*. The ensuing improvement in the affordability of accommodation for businesses and their employees would lead to more investment, hence faster economic growth, hence faster growth in the capacity to pay rent and service mortgages, hence (eventually) higher *absolute* returns to landowners despite their weaker bargaining position *relative* to tenants and buyers.

A similar result would follow from a tax designed not to raise revenue directly, but merely to force land onto the market — for example, a heavy punitive tax on vacant land and unoccupied buildings and suites. Such a tax is *deliberately designed to be avoided*. But in order to avoid it, landowners would build accommodation and seek tenants (or sell their land), giving more affordable accommodation, hence faster economic growth. Although such a tax would not raise significant revenue directly, it would do so *indirectly* because the ensuing economic activity would expand the bases of other taxes. This in turn would allow a reduction in existing tax *rates*, which would further encourage economic growth.

A less obvious example is a "capital-gains tax" on property. Such a tax, by default, would increase the attractiveness of current income relative to "capital gains" and would therefore encourage building and letting in order to generate current income. Again the improved affordability of accommodation would lead to faster economic growth. In this case the growth dividend would be compounded because the government receiving the revenue would thereby gain an incentive to invest in infrastructure.

Note the implication: whereas most taxes suppress production by causing otherwise viable ventures to become unviable, a land-value tax or vacancy tax or "capital-gains tax" *stimulates* production. In other words, whereas most taxes cause an excess burden (or deadweight cost), a land-value tax or a vacancy tax or "capital-gains tax" has *negative deadweight*. (The Treasury agrees with that conclusion concerning the land-value tax, for independent reasons; see Collyer 2015.) In the case of a land-value tax, the effect is compounded because the revenue allows a reduction in other taxes with positive deadweight. In the case of a vacancy tax, the effect is compounded because avoidance of the vacancy tax expands the bases of other taxes, allowing reductions in their rates. In the case of a "capital-gains tax" on property, the effect is compounded by increased public investment in infrastructure.

Even if faster economic growth is achieved at the expense of the *fraction* of GDP flowing to landowners, the cumulative effect of that growth must eventually leave landowners better off in *absolute* terms than they would otherwise be. This is especially obvious in the case of growth due to investment in infrastructure, of which the benefit is directly manifested as uplifts in land values. Considering all these mechanisms, one is forced to admit that the various property lobbyists opposing taxation of the economic rent of land constitute one of the more remarkable circular firing squads in economic history.

Assessing the impact of privatized land rent on economic growth

Conclusion

Theory and history indicate that an increase in the fraction of GDP flowing to landowners does *not* trickle down to labour or capital; on the contrary, an increase in the fraction of GDP flowing to labour and capital is associated with faster economic growth and therefore, over time, trickles *up* to landowners in absolute terms, although not in relative terms. This mechanism unequivocally recommends tax policies that strengthen the bargaining position of labour and capital relative to land.

Due to the tendency of land prices to develop an internal momentum and to absorb changes in capacity to pay (whether such changes are due to property taxes or other taxes or wider circumstances), discerning the influence of past tax changes on land prices is not straightforward.

Except at a few isolated times in the distant past, the fraction of GDP flowing to land is grotesquely understated in economic texts. Contrary to some texts, that fraction tends to grow over time.

If Australia were to replace all existing taxes by taxing the economic rent of land, the adequacy of the final tax base would depend on some of the forgone revenue (from the abolished taxes) being converted into additional rent. Theory and history provide confidence that the necessary conversion would occur. Confidence is increased because the theory applies not only to the abolished taxes but also to their deadweight costs. If the category "land" is expanded to include land-like assets other than *terra firma*, it is no longer clear that any conversion is needed (cf. Fitzgerald 2013).

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