Levels and Trends in Australian Income and its Distribution: A Crosswalk from Market Income towards a Comprehensive Haig-Simons Income Approach

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Motivation (1)

Tax records-based studies of top income shares (Atkinson, Piketty, Saez, et al.)

- Comparisons of top income shares across countries
  - Different methods
  - Different income components
  - Different ‘tax units’
Motivation (1) – Comparing top income shares across countries

World Top Incomes Database: Income share of the top 1% (excluding capital gains)

Australia: Include government benefits
US: Exclude government benefits

Australia: Tax unit is the individual
US: Tax unit is the family

Australia: Total income sourced from GDP
US: Total income a multiple of total market income captured by tax records
Motivation (2)

Reconciling tax-based inequality measures with survey-based measures

- Two distinct literatures with little intersection
- Not always telling the same story
- Tax data has no sampling error and possibly less measurement error; very useful for understanding top incomes
- However, survey-based measures have stronger conceptual foundations
Motivation (2) – Inequality trends in tax records and household survey data
Motivation (2) – Inequality trends in tax records and household survey data

Australia
2011-12 = 1
Motivation (3)

- The *cash* income focus of surveys may be misleading on levels of, and trends in, income inequality.
- Canberra Group standards result in income distribution studies not taking into account:
  - Irregular income (including ‘capital transfers’)
  - In-kind income
  - Expenditure taxes
  - Capital gains
Income concept – ‘Ideal’

Haig-Simons
Income = Consumption plus change in wealth
- Includes in-kind income
- Excludes taxes paid (i.e., post-tax)
- Implicit is that income is measured at the household level (household sharing unit)
  - Although ‘unit of analysis’ is most logically ‘the individual’
Some income concepts used in practice

- **Income unit**: Individual, family or household
- **Private income** (market income): Wages, dividends, interest, business income, etc.
- **Gross income**: Private income plus government cash benefits
- **Disposable income**: Gross income minus income taxes
- **Equivalised income**: Disposable income adjusted for household composition/size (eg using ‘modified OECD’ scale)
- ‘Full’ income: Add in-kind income (from government and private sources) and subtract taxes on expenditure
- ‘Comprehensive’ income: Add capital gains
Data used

- Tax records (with National Accounts)
- HILDA Survey

- Not used: ABS income surveys
Tax records measures – Australia (Atkinson and Leigh, 2007)

- Inequality measure is “Share of personal ‘declarable’ income of the top X% of persons aged 15 and over”
- Excludes some income components (non-taxable income)
- Income of *individuals* (so zero if no *personal* income, even if live with a high-income individual)
- Calculation:
  1. ABS population data: Total number of people in top x%
  2. Tax tables: Number of tax filers and **total** income in each category of **taxable** income
  3. National Accounts: Total household income

\[ \text{Numerator} = \text{ABS population data} + \text{Tax tables} + \text{National Accounts} \]

\[ \text{Denominator} \]

Top incomes – Tax records data

Top income shares (excluding capital gains)
Top incomes – HILDA Survey

Top income shares
Control total for income derived from HILDA Survey

- Top 1%
- Top 1-5%
- Top 5-10%

Graph showing the percentage distribution of income among different income groups from 2001 to 2013.
Tax records compared with HILDA

Top 1% income share

- Tax records
- HILDA only
- HILDA with National Accounts
Adjusting HILDA using *unit record* tax data

Unit record tax data:
- Available for each tax-year from 2003-04 to 2012-13
- 1% sample of individuals who lodged a tax return (2% sample since 2011-12)
- In principle better than tax tables (no need for distributional assumptions within income categories)
- BUT, it is confidentialised: Each income component is top-coded and bottom-coded
Censoring in unit record tax data

Proportion of observations with at least one income component top-coded (lower-bound)
In the graph, we see the income share of the top 1% from 2001 to 2013. The graph compares data from tax tables (blue line) and tax sample files (red line). Over the years, we observe fluctuations in the income share. The data from tax tables and tax sample files show similar trends, with slight variations.
Tax data - Tables versus unit record data

Income share of the top 1-5%

- Tax tables
- Tax sample file
Income share of the top 5-10%

- Tax tables
- Tax sample file
Adjusting HILDA with unit record tax data

We replace the top 10% of personal ‘declarable’ gross incomes with counterparts in unit record tax data

Income share of the top 1%

- Tax tables
- Tax sample file
- Adjusted HILDA (National accounts denominator)
- Adjusted HILDA (HILDA denominator)
HILDA adjusted with unit record tax data

Income share of the top 1-5%

Income share of the top 5-10%

- Tax tables
- Tax sample file
- Adjusted HILDA (National accounts denominator)
- Adjusted HILDA (HILDA denominator)
‘Crosswalking’ from Australian to US top incomes

Key differences between Australian and US measures of top income shares (World Top Incomes Database)

<table>
<thead>
<tr>
<th>Income in numerator</th>
<th>Australia</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gross ‘declarable’ income</td>
<td>Market income</td>
</tr>
<tr>
<td>Tax unit (income unit and unit of analysis)</td>
<td>Individual</td>
<td>Family</td>
</tr>
<tr>
<td>Income in denominator</td>
<td>National Accounts measure of household income</td>
<td>Multiple of total market income captured by tax records</td>
</tr>
</tbody>
</table>
Top income shares: Using adjusted HILDA data to crosswalk from Australian to US measure

Income share of the top 1%

- Aus tax unit, income and denominator
- Aus tax unit and income, US denominator
- Aus tax unit and US income and denominator
- US tax unit, income and denominator
Top income shares: Using adjusted HILDA data to crosswalk from Australian to US measure

Income share of the top 1%

- Aus tax unit, income and denominator
- US tax unit, income and denominator
Reconciling tax-based measures with household survey-based measures

- How is the top 1% income share affected by income concept and assumed sharing unit?
- What do other distributional features (e.g., median and Gini) look like as we move from the tax-based income concept and sharing unit to the household-survey-based income concept and sharing unit?
  - Using HILDA Survey data only (not adjusted using unit record tax data)
Top income shares – HILDA Survey estimates

Income share of top 1%

- ‘Tax gross’ of individuals aged 15+
- Market income of individuals aged 15+ (Canberra Group concept)
Top income shares – HILDA Survey estimates

Income share of top 1%

- ‘Tax gross’ of individuals aged 15+
- Market income of individuals aged 15+
- Gross income of individuals aged 15+
Top income shares – HILDA Survey estimates

Income share of top 1%

- ‘Tax gross’ of individuals aged 15+
- Market income of individuals aged 15+
- Gross income of individuals aged 15+
- Disposable income of individuals aged 15+

Years: 2001 to 2013.
Top income shares – HILDA Survey estimates

Income share of top 1%

- ‘Tax gross’ of individuals aged 15+
- Market income of individuals aged 15+
- Gross income of individuals aged 15+
- Disposable income of individuals aged 15+
- Equivalised disposable income of all persons
Top income shares – HILDA Survey estimates

Income share of top 1-5%

- 'Tax gross' of individuals aged 15+
- Equivalised disposable income of all persons
Top income shares – HILDA Survey estimates

Income share of top 5-10%

- ‘Tax gross’ of individuals aged 15+
- Equivalised disposable income of all persons
Gini coefficient – HILDA Survey estimates

Gini coefficient

'Tax gross' of individuals aged 15+
Equivalised disposable income of all persons
Median income – HILDA Survey estimates

(December 2013 prices)

- ‘Tax gross’ of individuals aged 15+
- Equivalised disposable income of all persons
Accounting for additional income components – Irregular income

Gini coefficient

- Equivalised disposable income of all persons
- Equiv. disposable income (incl. irregular)
Accounting for additional income components

Public health

- Take an ‘insurance value’ approach
- Method:
  - Use ABS household Expenditure Survey (HES) 2003-04 and 2009-10
  - Estimate (by OLS) value of household in-kind health services received from government as a function of the number of household members in each 5-year age-range
  - Predicted value is the insurance value
  - Non-HES years: Use health CPI to interpolate between 2003-04 and 2009-10, and to project back from 2003-04 and forward from 2009-10
Accounting for additional income components

Other government ‘social transfers in-kind’

- Use HES to estimate regression model of value for household as a function of household characteristics:
  - Number of school-age children (interacted with income quintile)
  - Number of pre-school-age children (interacted with income quintile)
  - Number aged 18-59 (interacted with income quintile)
  - Number aged 60 and over (interacted with income quintile)
  - Number of adults in full-time education
  - Number of adults in part-time education
  - Whether in public housing (interacted with number of household members)
  - Number of income support recipients aged less than 60
  - Number of income support recipients aged 60 or over

- Non-HES years: Use education CPI to interpolate & project
Accounting for additional income components

Expenditure taxes

- Use HES to estimate regression models of the share of household disposable income going in expenditure taxes. Estimated as a function of household type and income decile (interacted).
- Linearly interpolate between 2003-04 and 2009-10 and assume constant before and after this period.
Accounting for additional income components

- A limitation in respect of both ‘other social transfers in-kind’ and expenditure taxes is that this method artificially reduces dispersion in these income components.
  - But the net effect is reasonably small:

<table>
<thead>
<tr>
<th>Gini coefficient for equivalised disposable income net of expenditure taxes and including non-health government social transfers in-kind</th>
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</thead>
<tbody>
<tr>
<td>With actual values</td>
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<tr>
<td>---------------------</td>
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<tr>
<td>HES 03-04</td>
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<tr>
<td>HES 09-10</td>
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</tbody>
</table>
Accounting for additional income components

Imputed rental income from owner-occupied housing

- Variable constructed for CNEF
  - 4% of the difference between home value and mortgage debt on the home.
Accounting for in-kind income

Gini coefficient

- Equiv. disposable income (incl. irregular)
- Equiv. disposable income (incl. irregular) + public health
Accounting for in-kind income

Gini coefficient

- Equiv. disposable income (incl. irregular)
- Equiv. disposable income (incl. irregular) + public health
- Equiv. disposable income (incl. irregular) + all gov. social transfers in-kind (STIK)
Accounting for in-kind income and expenditure taxes

Gini coefficient

- Red: Equivalent disposable income (incl. irregular)
- Blue: Equivalent disposable income (incl. irregular) + public health
- Green: Equivalent disposable income (incl. irregular) + all gov. social transfers in-kind (STIK)
- Purple: Equivalent disposable income (incl. irregular) + STIK - expenditure taxes (Full income 1)

Years: 2001 to 2013
Accounting for in-kind income and expenditure taxes

Gini coefficient

- Equiv. disposable income (incl. irregular)
- Equiv. disposable income (incl. irregular) + public health
- Equiv. disposable income (incl. irregular) + all gov. social transfers in-kind (STIK)
- Equiv. disposable income (incl. irregular) + STIK - expenditure taxes (Full income 1)
- Full income 1 plus imputed rent (Full income 2)
Accounting for in-kind income and expenditure taxes

Median income
(December 2013 prices)

- Equivalent disposable income (incl. irregular)
- Equivalent disposable income (incl. irregular) + public health
- Equivalent disposable income (incl. irregular) + all gov. social transfers in-kind (STIK)
- Equivalent disposable income (incl. irregular) + STIK - expenditure taxes (Full income 1)
- Full income 1 plus imputed rent (Full income 2)
Accounting for employee non-cash benefits

Gini coefficient

- Equiv. disposable income (incl. irregular)
- Full income 1 plus imputed rent (Full income 2)
- Full income 2 plus ENCB (Full income 2a)
Capital gains

Yearly Accrued Capital Gains
1. Gains accrued this year on assets that were sold but are tax-sheltered
2. Gains accrued this year on taxable and tax-sheltered assets that were not sold in the year

Taxable Realized Capital Gains (available in tax data)
3. Gains accrued this year on taxable assets sold this year
4. Prior-year accrued gains on taxable assets sold this year
Capital gains

- Tax data contains **taxable realised** capital gains
- But in principle, **yearly accrued** capital gains on all assets is the quantity of interest.
- We use HILDA Survey data on wealth to estimate yearly accrued capital gains on housing, investments and businesses.
  - Brief intuition:
    - We observe holdings of these assets in 2002, 2006 and 2010
    - Housing (including investment properties): Capital gain is approximated by the ABS house price index (by state)
    - Investments and businesses: Capital gain is approximated by the ASX200
Yearly accrued capital gains – Estimated from HILDA Survey data

Mean and median equivalised capital gains
(December 2013 prices)
Top 1% income share including yearly accrued capital gains
Median income including yearly accrued capital gains

(December 2013 prices)
Gini coefficient including yearly accrued capital gains

- Equiv. disposable income (incl. irregular)
- Full income 1 plus imputed rent (Full income 2)
- Full income 2 plus accrued capital gains (Comprehensive income 1)
Concluding comments

- Income concept and sharing unit matter a lot
- Tax records data are measuring quite different things in different countries
- Tax records data and household survey data are measuring quite different things
- Broader notions of income change the story quite a bit also
  - (As others have shown) adding in-kind income reduces measured inequality
  - Adding accrued capital gains dramatically increases measured inequality and also substantially increases volatility over time