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OPEN ECONOMY MEASURES OF WEALTH AND HICKSIAN INCOME:
THE AUSTRALIAN EXAMPLE

Tony Makin
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AND HICKSIAN INCOME:
THE AUSTRALIAN EXAMPLE

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ABSTRACT

This paper highlights the significance of measuring the wealth of nations trading in an increasingly integrated global economy. Changes in national wealth, the difference between the value of internationally tradeable assets and external liabilities, provide an alternative measure of macroeconomic welfare and may be used to complement more traditional flow measures of gross national product and national income. Moreover, following Hicks (1946), changes in national wealth may be combined with consumption flows to yield a new measure of national income. Estimates of wealth and Hicksian income are presented for Australia by way of example.
I. Introduction

Macroeconomic performance is usually cast in terms of flow measures of national output and income since changes in these aggregates can affect employment and the price level. Reflecting this, traditional open economy macroeconomic theory deals almost exclusively with flow transactions within and between nations. Also, when making international comparisons, output levels per head are generally used as indicators of economic development.

However, is an economy whose real GDP is, say, $300 billion and whose real national net worth, or national wealth,¹ a stock measure, is $1,000 billion, necessarily better off than an economy of similar population with a lower GDP, say $290 billion, but significantly higher wealth, say $1200 billion? This example suggests conventional flow income measures should be augmented with stock measures of national wealth, to give a more complete picture of macroeconomic welfare.

Goldsmith and Lipsey (1963) first highlighted the significance of macroeconomic stock estimation and addressed some of the practical difficulties in devising a national balance sheet for the United States. Goldsmith (1985) later presented balance sheets for twenty countries emphasizing sectoral asset and liability positions and reconciling these with flow of funds data. However, Goldsmith devoted comparatively little attention to international assets and liabilities, focussing instead on the internal financial structure of national economies.

¹ The terms national net worth, and national wealth are used synonymously throughout this paper. Conceptually, of course, these terms also convey future consumption possibilities.
A wide range of deregulatory initiatives, including the abolition of capital controls, were implemented during the 1980's in most OECD countries. These policy initiatives, combined with technological progress in telecommunications, lower transactions costs and widespread financial innovation broke down barriers separating economies' financial markets and facilitated increased trade in real and financial assets. Not coincidentally, the international investment positions of many OECD countries also changed dramatically over this period with countries such as the United States, Canada, Australia, Ireland and New Zealand experiencing sharp rises in external liabilities which remain large relative to levels of earlier decades.

The one-sided attention given to economies' external liabilities is misleading, however. For nations exchanging assets in an increasingly integrated global trading system, it seems more appropriate to measure the relation between external liabilities and total internationally tradeable assets, not just residents' foreign assets. To do this, it is necessary to construct national balance sheets.

The aim of this paper is to highlight the significance of a total approach to macroeconomic stock estimation for globally integrated economies. The paper begins by deriving an expression for the sources of growth in an open economy's wealth, explicitly allowing for changes in the international investment position. Next, using Australia

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3 See Kennedy (1980), Bame (1985), Scholl (1989), Ulau and Dewald (1989) and Sinn (1990) for estimates and discussion of changing net external asset positions. The definition of net external assets adopted by these authors is restricted to foreign assets of residents less residents' external liabilities.
as an example, it shows how stock changes in wealth may be used to augment the
traditional income measure of macroeconomic welfare. A new measure of national
income, based on an insight of Hicks (1946), is then presented. Hicksian national income
combines stock changes derived from a national balance sheet, with present consumption
flows. Finally, the paper suggests that national balance sheets should be routinely
presented for open economies.

2. **Accounting for Changing Wealth in an Open Economy**

The behaviour of wealth in increasingly open economies can be gauged by estimating
stock changes in national balance sheets. These are linked to the aggregate flow accounts
via the national capital account, which records domestic saving and domestic and foreign
investment behaviour. As complements to the flow national income measures,
national balance sheets complete the full System of National Accounts (SNA) as actually
suggested by the United Nations.4

Taking the case of an internationally indebted open economy, national net worth, is simply
defined as the excess of the value of residents' assets, (comprised of consumer durables,5
the tangible capital stock, and foreign assets), over external liabilities, as shown in the
stylised balance sheet below.

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4 See United Nations (1968).

5 Consumer durables are included on the basis of Eisner's (1988) argument that these
   items yield a stream of benefits through time, even though they comprise a
   relatively small share of total assets. In Australia, for instance, consumer durables
   comprise only around 7 per cent of private wealth (Australian Treasury, 1991).
Stylised Open Economy Balance Sheet

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities (Claims on Assets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Durables</td>
<td>Foreign Liabilities</td>
</tr>
<tr>
<td>Capital Stock</td>
<td>– Private</td>
</tr>
<tr>
<td>– Private</td>
<td>– Public</td>
</tr>
<tr>
<td>Foreign Assets</td>
<td>Residents' Net Worth (National Wealth)</td>
</tr>
<tr>
<td>– Private</td>
<td>Total Claims</td>
</tr>
<tr>
<td>– Public</td>
<td></td>
</tr>
<tr>
<td>Total Assets</td>
<td></td>
</tr>
</tbody>
</table>

In what follows, the sources of growth in national wealth for an open economy are revealed in an expression which includes an explicit role for international investment. In deriving the expression, all stock and flow variables are presumed to be adjusted for the effects of goods and services inflation and are net of capital stock depreciation (or consumption of fixed capital).

Starting with the assets side of the national balance sheet, we can relate the real value of total assets at an earlier date \((t)\) to the value of total assets at a later date \((j)\), as well as to other accumulation and valuation changes which occurred between these points in time. Hence,

\[
K(t) + A'(t) = K_0(t) + \int_0^t (K(t) \text{d}t + D(t) \text{d}t + v(t)) + [A_0'(t) + \int_0^t (L'(t) \text{d}t + v(t)^*)] \tag{1}
\]
where $K_{k}(t)$ is the market value at dates $h,j$ of the tangible capital stock located domestically,

$A'_{k}(t)$ is the market value at dates $h,j$ of the foreign assets of residents,

$I(t)$ is domestic investment net of consumption of fixed capital between $h$ and $j$,

$D(t)$ is domestic expenditure on consumer durables between $h$ and $j$,

$v(t)$ is capital gains on all domestic assets between $h$ and $j$,

$I'_{k}(t)$ is foreign investment abroad between $h$ and $j$, and

$v'(t)$ is capital gains on foreign assets between dates $h$ and $j$.

Now, the definition of net worth relating national assets and external liabilities is

$$NW_{k}(t) = K_{k}(t) + A'_{k}(t) - F_{k}(t)$$

(2)

where $NW(t)$ is net worth and $F(t)$ is gross external liabilities for the host country.

Substituting (2) into (1),

$$NW(t) + F(t) = NW_{k}(t) + F_{k}(t) + \int_{\frac{h}{j}}^{1} I(t) dt + v(t) + \int_{\frac{h}{j}}^{1} I'(t) dt + v'(t)$$

(3)

Therefore, the stock change in the value of net worth ($dNW$) between dates $h$ and $j$ is

$$dNW(t) = NW(t) - NW_{k}(t) = F_{k}(t) - F(t) + \int_{\frac{h}{j}}^{1} I(t) dt + \int_{\frac{h}{j}}^{1} I'(t) dt + \int_{\frac{h}{j}}^{1} D(t) dt + v(t) + v'(t)$$

(4)

We may now introduce international capital flows by recalling that, conceptually, net foreign investment is the difference between gross capital inflow and gross capital outflow between two dates. Also, according to SNA convention, external account flows exclude all capital gains and losses on the face value of stock claims. Hence,
\[ \int_{h}^{j} NFI(t) \, dt = \int_{h}^{j} I_s^*(t) \, dt - \int_{h}^{j} I_s(t) \, dt = [F_s(t) - F_s(t) - z(t)] - [A_s^*(t) - A_s(t) - v^*(t)] \] (5)

where \( NFI(t) \) is net foreign investment

\( I_s^*(t) \) is gross foreign capital inflow and

\( z(t) \) is capital gains on domestic assets to which foreigners hold direct claims.

Using (5) to substitute for \( I_s^* \) in (4), it follows algebraically that

\[ dNW(t) = \frac{\int_{h}^{j} l(t) \, dt + \int_{h}^{j} D(t) \, dt - \int_{h}^{j} NFI(t) \, dt + v(t) + v^*(t) - z(t)}{\text{net accumulation}} \] \] \[ \text{net capital gains} \] (6)

Equation (6) reveals the fundamental sources of growth in national wealth, between dates \( h \) and \( j \). National wealth rises because of greater accumulation, capital gains or both. Amongst other things, this expression implies that if additional domestic investment is fully financed by external borrowing, then macroeconomic welfare improves whenever the value of the additional real capital exceeds the value of the extra foreign debt.

Using the conventional definition of national saving (gross national product less total consumption) which is exclusive of spending on consumer durables, it can be shown easily that the accumulation term above is simply equal to national saving between \( h \) and \( j \). This is because the integral of \( NFI \) is also the difference between the integrals for investment and the conventional saving measure i.e., \( \int_{h}^{j} NFI(t) \, dt = \int_{h}^{j} l(t) \, dt - \int_{h}^{j} S(t) \, dt \).
3. **Combining Measures of Income and Wealth: The Australian Case**

To illustrate how national wealth accounting may augment conventional national income accounting for an internationally integrated economy, consider Table 1 below which includes estimates of national assets and claims on assets for Australia for the decade of the 1980's. This table reveals that real national wealth, at an average annual growth of 4.8 per cent, significantly outpaced growth in national disposable income which averaged 3.2 per cent.

Chart 1 depicts the behaviour of the major balance sheet aggregates throughout the 1980's. The vertical distance in Chart 1 between total asset and net worth values at any date is the value of gross external liabilities. The most salient feature of the wealth account is that strong growth in total asset values easily offset the sharp rise in foreign claims on real assets domiciled in Australia, as manifested in a $429b increase in the real value of national net worth over the period. Despite this fact however, the rise in external claims, particularly in the form of foreign debt, became a widespread concern and focus of Australia's macroeconomic policy over the period.

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6 The methodology and sources of data are discussed more fully in Makin (1992).

## Table 1  National Income and Wealth – Australia (S$b, constant prices)

<table>
<thead>
<tr>
<th>Year (a)</th>
<th>INCOME ACCOUNT</th>
<th>WEALTH ACCOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gross Domestic Product (b)</td>
<td>Income and Transfers Paid Abroad (b)</td>
</tr>
<tr>
<td>1980–81</td>
<td>192.45</td>
<td>3.13</td>
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<tr>
<td>1981–82</td>
<td>195.47</td>
<td>3.93</td>
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<tr>
<td>1982–83</td>
<td>192.79</td>
<td>4.26</td>
</tr>
<tr>
<td>1983–84</td>
<td>203.46</td>
<td>4.77</td>
</tr>
<tr>
<td>1984–85</td>
<td>214.47</td>
<td>6.29</td>
</tr>
<tr>
<td>1985–86</td>
<td>224.82</td>
<td>6.62</td>
</tr>
<tr>
<td>1986–87</td>
<td>231.19</td>
<td>6.47</td>
</tr>
<tr>
<td>1987–88</td>
<td>241.89</td>
<td>6.88</td>
</tr>
<tr>
<td>1988–89</td>
<td>251.21</td>
<td>8.28</td>
</tr>
<tr>
<td>1989–90</td>
<td>260.02</td>
<td>9.64</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td>1980–81</td>
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<td>1988–89</td>
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<tr>
<td>1989–90</td>
<td></td>
<td></td>
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</tbody>
</table>

**Notes to the Accounts:**

(a) Flow entries in the income account are recorded for the period from beginning July to end June; stock entries in the wealth account are as at the end of the financial year.


(c) Total assets are defined as the sum of consumer durables, capital equipment, dwellings, non-dwelling construction, inventories and investment abroad, net of capital consumption;


(d) Source: Australian Bureau of Statistics, *Foreign Investment, Australia*, Catalogue 5305.0 (various).

(e) Derived as the difference between total assets and foreign claims on assets; market values of all assets and claims on assets deflated by the consumption deflator for June quarter.
CHART 1 – NATIONAL BALANCE SHEET AGGREGATES – AUSTRALIA
Chart 1 suggests that ordinary consumption, fully financed by foreign borrowing, could have been substantially higher in Australia during the 1980's to the extent of the shaded area without diminishing national wealth between the beginning and end of the decade. In the late 1980's in particular, the chart reveals that gross external liabilities could have more than doubled to finance extra ordinary consumption, which would have unambiguously improved economic welfare, and that this would have left the nation no worse off in real net worth terms than at the beginning of the 1980's. This leads us to consider an alternative measure of national income which encompasses stock change measures of national wealth.

According to Hicks (1946) income is "...the maximum value a person can consume during a given period and still expect to be as well off at the end of the period as at the beginning". By extension, national income could alternatively be defined as the maximum attainable consumption by a nation's residents in a given period, which leaves the aggregate real value of future consumption possibilities, as reflected in national net worth, the same at the end of the period as at the outset.

This alternative Hicksian concept of national income can actually be measured using the information provided in Table 1. To approximate Hicksian national income ($Y^h$) in a given year, we simply add realised aggregate consumption to potential additional consumption, as represented by the change in national net worth i.e. $Y^h = dNW + C$. 
See Table 2 which compares estimated Hicksian national income with official measures of national disposable income. The net worth measure used here, to avoid double counting, is a narrower measure, which excludes spending on consumer durables, already included in the SNA measures of consumption.

The alternative income series are contrasted in Chart 2. Interestingly, this chart reveals that Hicksian national income persistently exceeded the standard national income measure throughout the 1980's, except in recession affected years, 1982–83 and 1989–90. Conventional national income averaged $180.0b in 1984–85 prices over the decade, whereas Hicksian income averaged a significantly higher $212.9b. The Hicksian estimates are evidently more variable than the conventional measures however, largely reflecting sharp movements in the market price values of private sector assets.

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* SNA measures of national disposable income are net of income and transfers paid abroad and capital consumption allowances.
Table 2  Conventional vs Hicksian National Income – Australia ($b, constant prices)

<table>
<thead>
<tr>
<th>Year</th>
<th>National Disposable Income(a)</th>
<th>Private Consumption(a)</th>
<th>Public Consumption(a)</th>
<th>Total Consumption(a)</th>
<th>Change in National Wealth(b)</th>
<th>Hicksian National Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980–81</td>
<td>160.8</td>
<td>114.3</td>
<td>35.0</td>
<td>149.3</td>
<td>55.9</td>
<td>205.2</td>
</tr>
<tr>
<td>1981–82</td>
<td>163.3</td>
<td>119.0</td>
<td>35.3</td>
<td>154.3</td>
<td>-21.9</td>
<td>132.4</td>
</tr>
<tr>
<td>1982–83</td>
<td>158.4</td>
<td>120.3</td>
<td>36.3</td>
<td>156.6</td>
<td>7.1</td>
<td>163.7</td>
</tr>
<tr>
<td>1983–84</td>
<td>167.5</td>
<td>123.4</td>
<td>38.0</td>
<td>161.4</td>
<td>30.0</td>
<td>191.4</td>
</tr>
<tr>
<td>1984–85</td>
<td>175.4</td>
<td>127.9</td>
<td>40.2</td>
<td>168.1</td>
<td>15.99</td>
<td>184.1</td>
</tr>
<tr>
<td>1985–86</td>
<td>179.7</td>
<td>132.4</td>
<td>42.1</td>
<td>174.5</td>
<td>57.78</td>
<td>232.3</td>
</tr>
<tr>
<td>1986–87</td>
<td>182.9</td>
<td>133.5</td>
<td>43.1</td>
<td>176.6</td>
<td>35.75</td>
<td>212.4</td>
</tr>
<tr>
<td>1987–88</td>
<td>194.1</td>
<td>138.9</td>
<td>44.2</td>
<td>183.1</td>
<td>106.62</td>
<td>289.7</td>
</tr>
<tr>
<td>1988–89</td>
<td>206.7</td>
<td>144.3</td>
<td>44.8</td>
<td>189.1</td>
<td>126.56</td>
<td>315.7</td>
</tr>
<tr>
<td>1989–90</td>
<td>210.9</td>
<td>150.4</td>
<td>45.4</td>
<td>195.8</td>
<td>7.07</td>
<td>202.9</td>
</tr>
</tbody>
</table>

Notes:
(a)  Source: Australian Bureau of Statistics, Australian National Accounts, Catalogue 5204.0 (various).
(b)  Derived from Table 1 as the real annual stock change in the value of domestic claims on total assets.
CHART 2 - ALTERNATIVE NATIONAL INCOME MEASURES - AUSTRALIA
4. Conclusion

The external liabilities of nations, particularly in the form of debt, as opposed to equity, are often considered in absolute value terms and in isolation, and have seemingly assumed an importance of themselves. Alternatively, external liabilities are often expressed in relation to GDP, for purposes of international comparison, although such measures are really devoid of economic content.

This paper suggests that the widespread attention afforded to external liabilities, even net of foreign assets, is too narrow and can be misleading when interpreting the overall performance of open economies. To counterbalance this, a total approach to measuring internationally saleable assets should be adopted by central statistical agencies. Routinely published national wealth accounts would then provide a more appropriate and complete picture of international macroeconomic welfare, notwithstanding the many measurement difficulties likely to arise in valuing nations' tradeable assets and liabilities.

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See World Bank.
References


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