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**STATISTICS DIRECTORATE
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Working Party on National Accounts

SNA INDICATORS AND TERMS OF TRADE

**To be held on 27 - 28 October 2011
OECD Conference Centre
Beginning at 2:30 p.m. on the first day**

This document has been prepared by Michael Davies (Australian Bureau of Statistics) and will be presented under item 2 of the draft agenda

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Working Party on National Accounts

SNA Indicators and the terms of Trade

Paper Prepared by the Macroeconomics Research Section, ABS

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Abstract

The System of National Accounts 2008 (2008 SNA) is a comprehensive framework that presents various summary statistics for measuring economic activity, but no single identity for encapsulating economic performance. This paper examines the ability of some summary statistics to describe economic phenomena, specifically the effect of large terms of trade changes on Australia's national welfare during the current Australian mining boom. The paper covers several key economic policy issues that arise due to the effects of the changes to the terms of trade. This paper finds that using the Real Net National Disposable Income (RNNDI) identity is appropriate for depicting consumption possibilities for an economy. Examining Australia's measure of RNNDI indicates that although the terms of trade change is providing a positive effect to the economy, other factors such as net property income payable to the rest of the world have offset these gains.

Introduction

The System of National Accounts 2008 (2008 SNA) is a comprehensive framework for measurement of economic activity. Consequently, no one summary statistic can encapsulate economic performance. The ABS produces a range of summary statistics from the national accounts including Gross Domestic Product (GDP), however, the behaviour of GDP may not account for other economic developments adequately.

This paper examines the behaviour of some additional summary statistics produced by the ABS and finds that they are helpful in describing economic phenomena such as terms of trade impacts on national welfare during the current mining boom.

Australia's mining boom

Since 2003, the Australian economy has experienced a mining boom which has persevered through global economic downturns and turmoil. A sizeable factor in the resilience of this boom has been the high demand for Australian exports, particularly mining commodities.

Contrary to the perception however, Australia's GDP volume measure shows that this boom has been driven not by mining activity, but by construction activity. This is because unlike Australia's mineral boom of the 1970s, which was a result of export volume growth, evidence suggests that the current mining boom is being driven more by growing export prices than by an increase in export volume. The effect of this large export price rise for a significant proportion of exports is that the terms of trade improve.

Prior to the current mining boom, Australia's terms of trade had experienced relatively few upswings, which coincided with times of significant world economic growth. With the beginning of the current mining boom in 2003, the upswing in the terms of trade has been far larger than any previously recorded. It has also been sustained for far longer than any previous upswing.

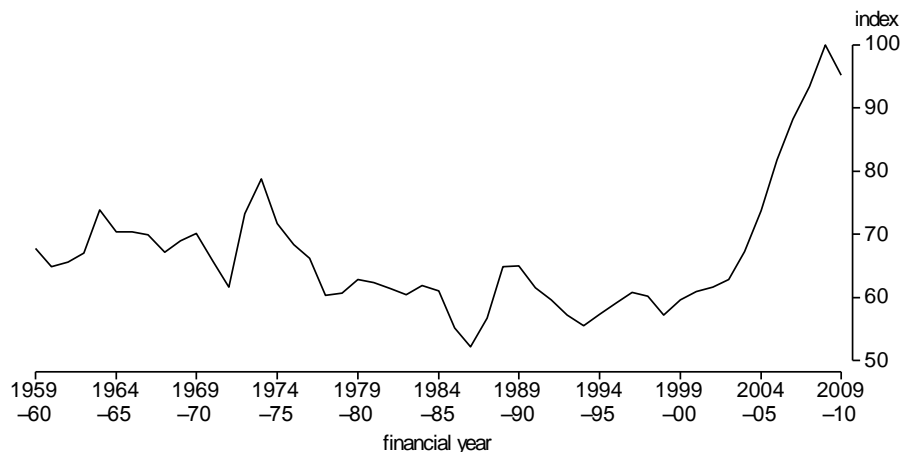
Measuring the Effects of Trade

A sizeable change to an economy's terms of trade generally has two key effects: direct effects, such as trading gains; and indirect effects, such as increased employment. The change in Australia's terms of trade should be evident in indicators of wealth and economic growth. The 2008 SNA suggests a number of summary indicators and states that its main objective is *to provide a comprehensive conceptual and accounting framework that can be used to create a macroeconomic database suitable for analysing and evaluating the performance of an economy* (SNA 1.27).

It notes that *certain key aggregates of the SNA, such as GDP and GDP per head of population, have acquired an identity of their own and are widely used by analysts, politicians, the press, the business community and the public at large as summary, global indicators of economic activity and welfare* (SNA 1.28). However, GDP measures production: *GDP is the sum of gross value added of all resident producer units plus that part (possibly the total) of taxes on products, less subsidies on products, that is not included in the valuation of output*" (SNA 2.138). GDP in volume terms is not intended to reflect terms of trade effects and other indicators of performance are suggested by the SNA.

The SNA also suggests another indicator, Real Gross Domestic Income (RGDI), which captures the effects of terms of trade changes. *Real gross domestic income (real GDI) measures the purchasing power of the total incomes generated by domestic production. It is a concept that exists in real terms only. When the terms of trade change there may be a significant divergence between the movements of GDP in volume terms and real GDI (SNA 15.188).*

TERMS OF TRADE: INDEX, Reference year 2008-2009



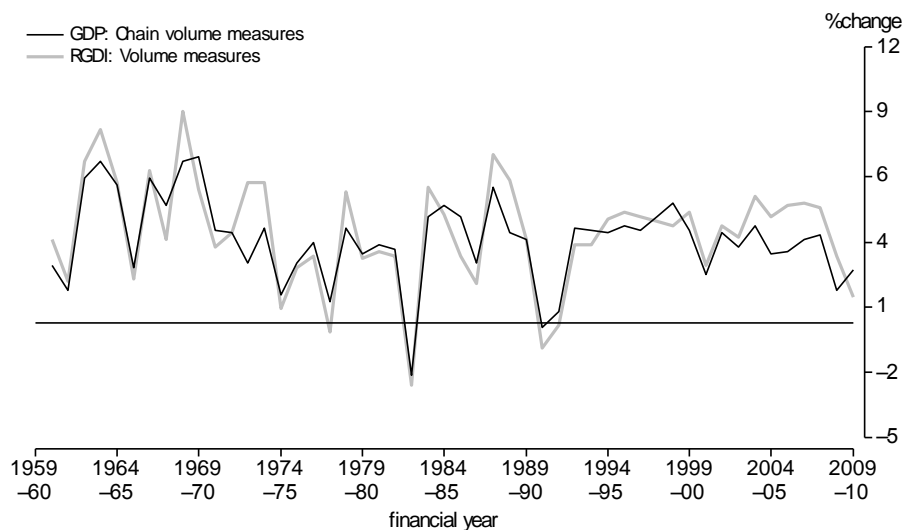
SNA acknowledges the impact of terms of trade on real incomes, stating that *the total real income that residents derive from domestic production depends also on the rate at which exports may be traded against imports from the rest of the world (SNA 15.186)*. The drafters of the 2008 SNA observe that consensus on a method for accounting for terms of trade effects could not be reached: *There is one important choice to be made in the measurement of trading gains or losses, the selection of the price index P with which to deflate the current trade balance. There is a large but inconclusive literature on this topic, but one point on which there is general agreement is that the choice of P can sometimes make a substantial difference to the results. Thus, the measurement of real GDI can sometimes be sensitive to the choice of P and this has prevented a consensus being reached on this issue. (SNA 15.189)*. As a result SNA is not prescriptive concerning the derivation of RGDI.

The ABS takes the view that in an open economy, the real value of exports is best measured by the value of imports that can be purchased from exporting. As a result, the ABS derives the trading gains measure by using the import price deflator.

Indicators of Economic Welfare

The divergence between changes in GDP in volume terms and RGDI is clearly visible in the graph below. Coinciding with the upswings in the terms of trade, divergences arise in the 1970s and in the late 1980s but last for a relatively short time. With the current mining boom however, the growth in RGDI has outperformed GDP for all years except the 2008-09 financial year. This supports the proposition that terms of trade effects have strongly influence Australia's economic welfare.

GROSS DOMESTIC PRODUCT VS REAL GROSS DOMESTIC INCOME, Percentage changes



RGDI measures incomes derived from GDP adjusted for terms of trade. These incomes are supplemented by net incomes paid to the rest of the world. SNA suggests an indicator that takes into account net primary incomes payable to the rest of the world, Gross National Income (GNI): *GNI is equal to GDP less primary incomes payable to non-resident units plus primary incomes receivable from non-resident units* (SNA 2.143). Note that GNI is a different indicator to GDP measured by the income method. GNI measures income, not value added.

The SNA notes the distinction between deriving “real” measures of income and measuring production in “volume” terms.

SNA 15.181 Many flows in the SNA, such as cash transfers, do not have price and quantity dimensions of their own and cannot, therefore, be decomposed in the same way as flows related to goods and services. While such flows cannot be measured in volume terms they can nevertheless be measured “in real terms” by deflating their values with price indices in order to measure their real purchasing power over some selected basket of goods and services that serves as the numeraire.

SNA 15.182 It is possible by use of a numeraire to deflate any income flow in the accounts and even a balancing item such as saving may be deflated by a price index in order to measure the purchasing power of the item in question over a designated numeraire set of goods and services. By comparing the deflated value of the income with the actual value of the income in the base year, it is possible to determine by how much the purchasing power of the income has increased or decreased. Income deflated in this way is generally described as “real income”.

The terms of trade adjustment to derive RGDI from GDP in volume terms has to be supplemented by deflating net primary income payable to the rest of the world to derive RGNI.

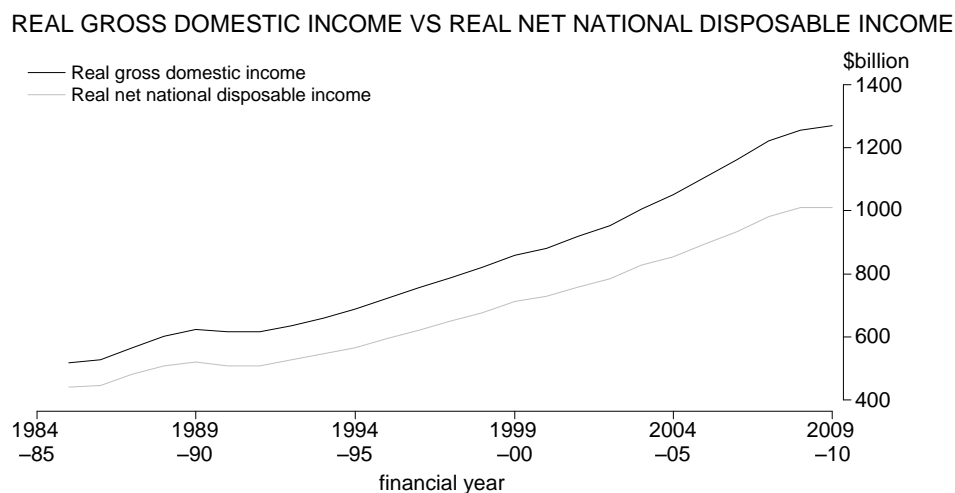
RGNI is an income measure and not a measure of consumption possibilities (which might be thought of as a measure of welfare derivable from economic activity). SNA defines another indicator called Real Net National Disposable Income (RNNDI) that expands on RGNI to account for depreciation of fixed capital and the amounts of property incomes receivable and

payable to the rest of world. This is a measure of the total final consumption and saving possibilities of an economy.

The set of related indicators is elaborated in SNA 15.193 *The usual way to calculate real income figures is to start from real GDI and then follow the normal sequence of income aggregates, but with every intervening adjustment deflated to real terms. This is illustrated as follows:*

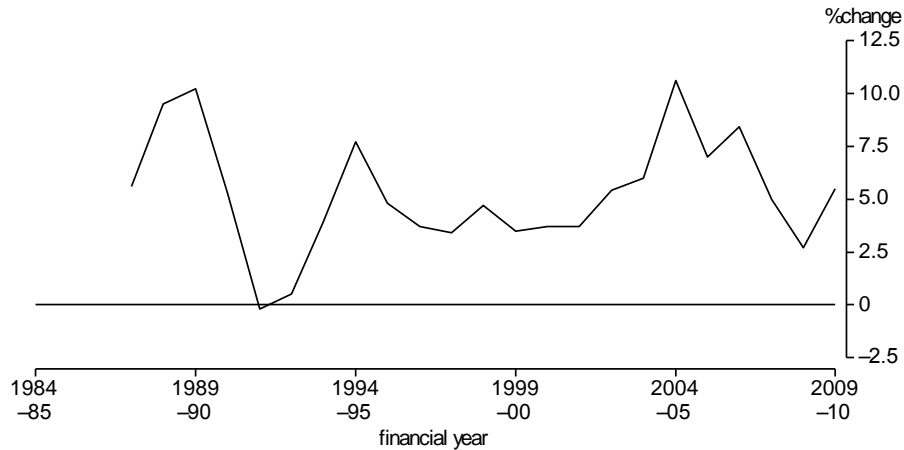
- a. *Gross domestic product in volume terms;*
plus the trading gain or loss resulting from changes in the terms of trade;
- b. *equals real gross domestic income;*
plus real primary incomes receivable from abroad;
minus real primary incomes payable abroad;
- c. *equals real gross national income;*
plus real current transfers receivable from abroad;
minus real current transfers payable abroad;
- d. *equals real gross national disposable income;*
minus consumption of fixed capital in volume terms;
- e. *equals real net national disposable income.*

The ABS RNNDI series began in 1986 and shows that Australia's wealth has been growing steadily over time, with two small exceptions in 1991 and 1992. An important detail to note is that the two measures have diverged over time. This divergence is in fact increasing over time.



By looking at the growth of this divergence, it is clear that the rate of increase in the divergence shows large upswings that coincide with the 1989-1990 boom and the current boom starting 2003.

DIFFERENCE BETWEEN RGDI AND RNNDI, percentage change

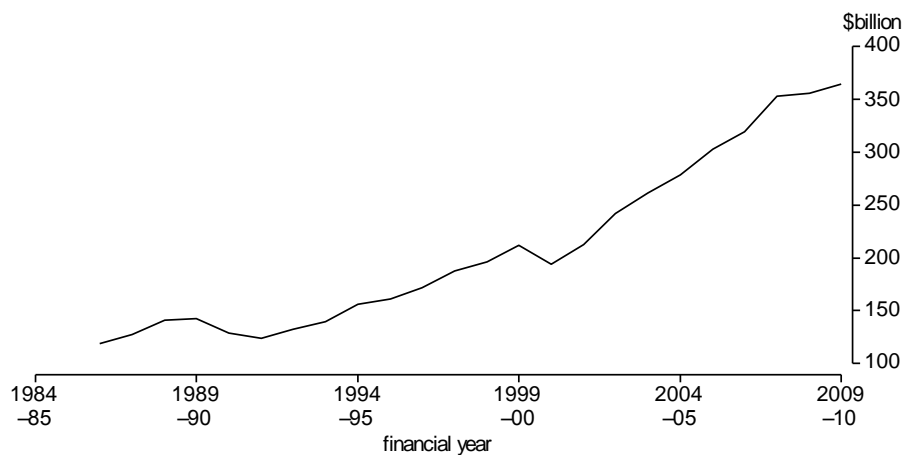


The reasons for the increased divergence can be explained through the derivation of the RNNDI identity from RGDI. There are two factors that together will explain the divergences: increased depreciation of fixed capital and amount of net property income payable to the rest of the world.

Fixed capital formation in Australia, which has been linked with the strong increase in volume based construction activity, has grown over the period of the current mining boom. As a result the levels of depreciation in the economy will also have increased, reflecting the greater 'wear and tear' from heightened economic activity.

Net property income payable to the rest of the world, which is greatly influenced by the amount of foreign investment in the economy, has fluctuated over this period. For the most part however, an upswing in net property income payable has taken on a significant increase from 2009 onwards.

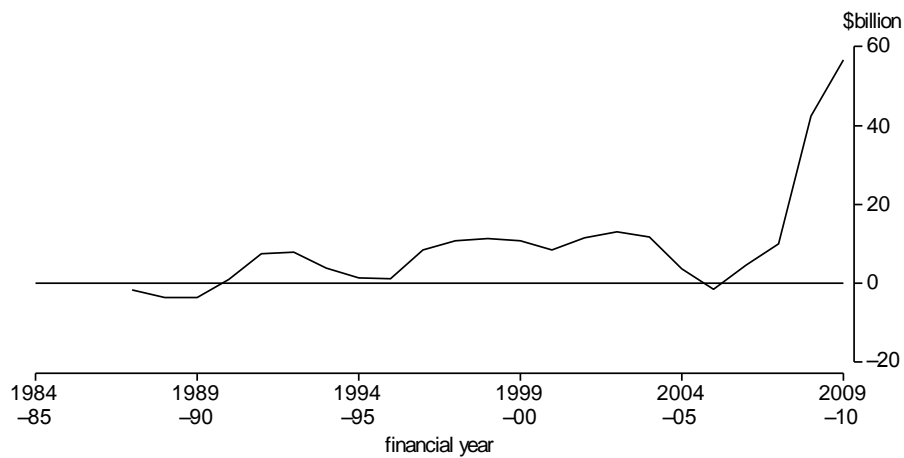
GROSS FIXED CAPITAL FORMATION, Chain volume measures



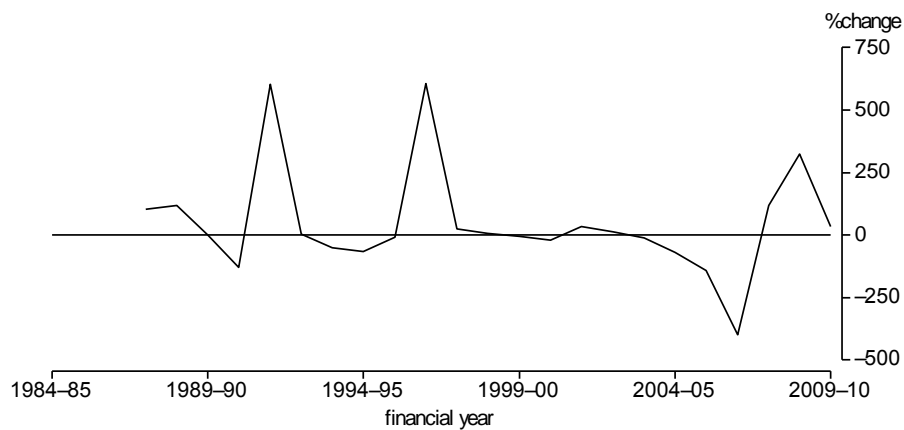
GROSS FIXED CAPITAL FORMATION, Chain volume measures, percentage change



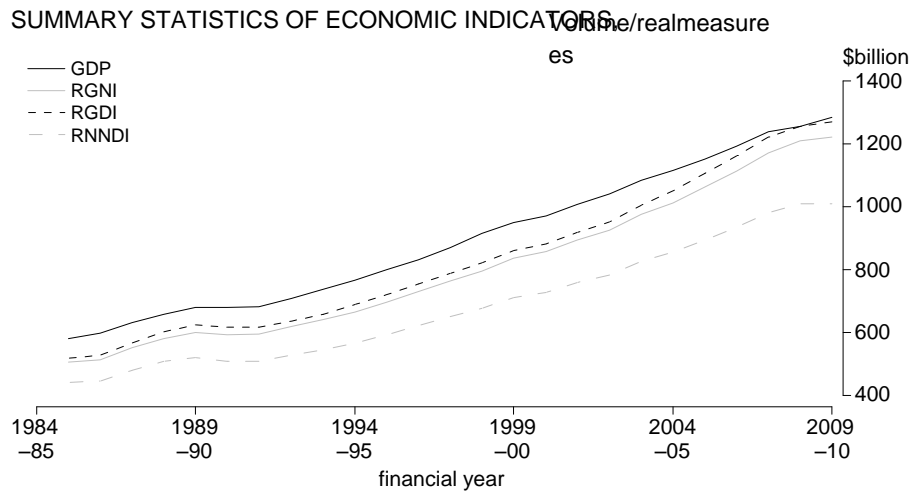
NET PROPERTY INCOME PAYABLE TO THE REST OF THE WORLD, Current prices



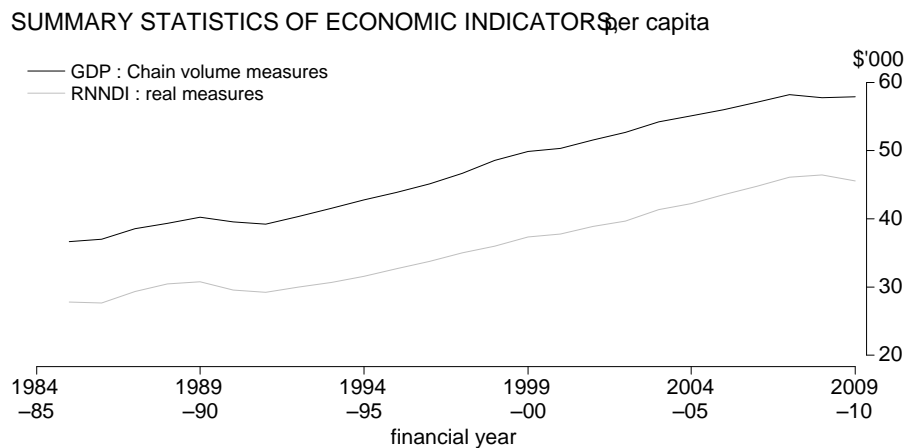
NET PROPERTY INCOME PAYABLE TO THE REST OF THE WORLD, Current prices, percentage change



Australia's current RNNDI growth appears relatively flat compared to other summary statistics. The following graph shows that although RGDI grew faster than GDP, RGNI and RNNDI under the influence of terms of trade, the other measures suggest that the gains from terms of trade have tended to be distributed to increased depreciation and net income payments to the rest of the world, and are less likely to be available for domestic consumption.



On a per capita basis RNNDI is showing a tendency to decline relative to GDP in volume terms.



Conclusions

The RNNDI per capita identity provides the most accurate depiction of the consumption possibilities available to an economy.

The current upswing in Australia's terms of trade has had a positive effect on the wealth of the Australian economy; however, the combined effect of increased depreciation and a recent surge in net property income payable to the rest of the world has not seen these gains increase the consumption possibilities in Australia, as measured by RNNDI per capita.

The comprehensive collection of economic indicators described in SNA will assist in understanding the range of economic behaviours observable in a modern open economy. The ABS has produced most of these indicators for a long time.

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