# Box D: Annually Chained Estimates of the National Accounts

In the September quarter National Accounts, the Australian Bureau of Statistics will be changing the methodology it uses to derive estimates of the quantity of output and its components. Annually chained estimates will replace the present set of constant price estimates. The new estimates should provide a more accurate assessment of the composition of growth in the economy and relative price movements. To preview these changes, an experimental set of annually chained quantity estimates for GDP(E) and its components were published in March in an information paper.[1]

Noticeable differences between the new chained estimates and the presently published numbers arise when there have been significant changes in the relative prices or quantities of different goods and services demanded or supplied in the economy. Such changes lead to a divergence between price and quantity indices calculated using different methods, such as between base-period-weighted (Laspeyres) and current-period-weighted (Paasche) indices. In a situation in which these divergences are large, frequently re-weighted chained measures provide a better summary of developments.[2]

Graph D1 illustrates that the annually chained and present estimates provide a very similar picture for the expenditure measure of GDP. Over the 7 years to December 1997, these measures imply that growth has

Graph D1

Real GDP(E)
Reference year: 1989/90

Annually chained measure

Present constant price measure
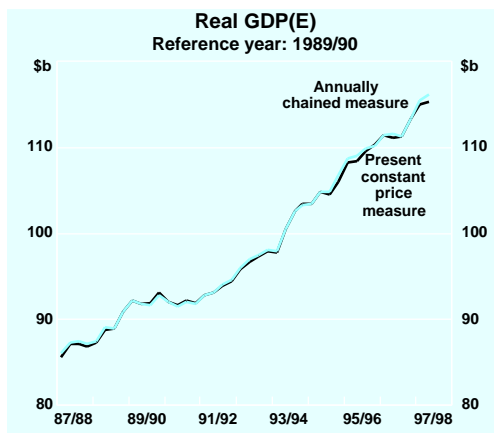
averaged 3.5 and 3.3 per cent, respectively, though in some periods estimates of quarterly and year-ended growth differ on account of temporary movements in relative prices.

The generally similar aggregate outcomes for GDP(E) in the two sets of estimates reflect some significant but offsetting differences at the level of individual expenditure components. The principle source of these differences is the substantial fall in the relative price of computers that has taken place since the base year: computer prices in relative terms have fallen by about 80 per cent since 1989/90. This means that since 1989/90, the present fixed-weighted quantity indices of expenditure components,

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1. See *Introduction of Chain Volume Measures in the National Accounts*, ABS Information Paper Cat. No. 5248.0.

2. Currently, quantity estimates in the National Accounts are fixed-weight indices. From 1984/85 to the present, for example, nominal expenditure shares in 1989/90 are used when weighting together the different components of output. This implies that from 1989/90 onwards, quantity estimates in the National Accounts are derived from a sequence of Laspeyres indices. An alternative (but equally valid) estimate of the quantity of output over this period could be derived using expenditure shares in the latest period; that is, the quantity of output could be derived from a sequence of Paasche indices. If large relative price and quantity movements occurred over the period, however, these two estimates would diverge. For example, if there was a large relative price fall for one component whose quantity was rising rapidly, growth derived from the Laspeyres indices would overstate the 'true' growth taking place in the economy, and growth derived from the Paasche indices would understate it. Moving to annually chained indices should substantially reduce the extent of this divergence, because it will reduce the extent to which relative prices and quantities move within any period in which weights are being held fixed.
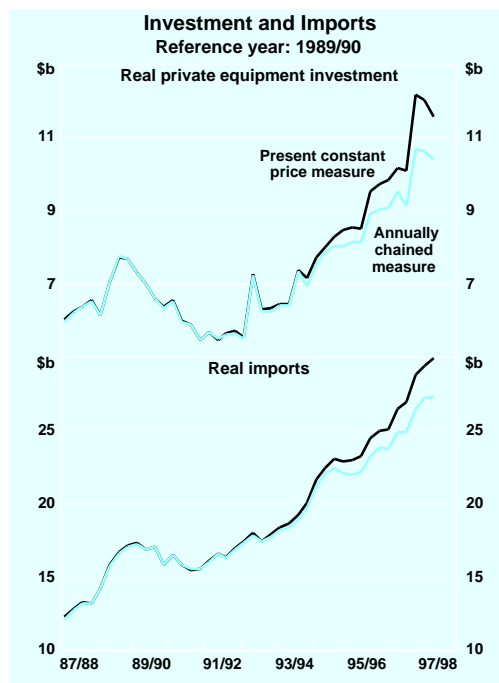
which do not take this relative price fall into account, are increasingly giving too high a weight to computers. Since spending on computers is growing faster than other areas of spending, this biases upward the estimated growth in any category of spending in which computers form a significant part. In particular, growth in the quantity of equipment investment, imports and (to a lesser extent) consumption have all been overstated. Since computers are largely imported, these effects are largely offsetting between categories of domestic output and there is little effect on GDP.

Graph D2 shows two measures of both real private investment and real imports. In each case, the higher measure is derived using 1989/90 prices, and is the series presently published by the ABS. The second measure is the annually chained estimate. Comparing these measures suggests that, over the past

couple of years, the presently published data have overstated annual growth in real equipment investment by about 4 percentage points, and hence private final demand by around $^2/_3$ of a percentage point. The overstatement of real import growth, by around $2^1/_2$ percentage points, has largely offset this bias, leaving the level of total output little affected.

The counterpart to these findings is that the present implicit price deflators for equipment investment and imports have been understating the 'true' growth in these prices in recent years. And, as a consequence, presently published estimates of the terms of trade have been misleading. Graph D3 shows that estimates of the terms of trade based on the annually chained data are somewhat lower than the presently published estimates, especially during the past few years. Again, the main reason for this is that the traditional terms of trade measure has, in recent years, effectively given increasing weight to computer prices. Given that computers are mainly imported and that their prices are falling, this leads to an increasing upward bias in the terms of trade measured on the present basis. ⚓

Graph D2

Investment and Imports
Reference year: 1989/90
Real private equipment investment

Present constant price measure

Annually chained measure

Real imports

Graph D3

Terms of Trade
1989/90 = 100

Present measure

Annually chained measure