

ADB/ESCAP Concluding Workshop on RETA 5874
REBASING AND LINKING OF NATIONAL ACCOUNTS SERIES
13 -16 February 2001
Bangkok

Introduction

1. The Singapore Department of Statistics (DOS) compiles Gross Domestic Product (GDP) estimates by the three approaches, i.e. output, expenditure and income. Historical series of annual real and nominal GDP estimates using the output and expenditure approaches are available from 1960, while annual nominal GDP estimates using the income approach are available from 1980.
2. DOS has also compiled the quarterly estimates of real GDP using the output and expenditure approaches since mid-1970s and late 1980s respectively. In 1997, DOS initiated a project to develop and compile quarterly estimates of output-based nominal GDP, motivated by an increasing need for quarterly estimates of nominal GDP. With the completion of this project, quarterly estimates of nominal output-based GDP estimates have been released since 1Q 2000. Historical data series of quarterly real and nominal output-based GDP estimates from 1985 and quarterly real expenditure-based GDP estimates from 1975 are available in TREND, an on-line time series database that is available for public subscription.
3. DOS follows closely the United Nations' System of National Accounts (SNA), and has implemented progressively the recommendations of the 1993 SNA.

Timeliness

4. DOS publishes preliminary quarterly GDP estimates no later than nine weeks after the end of the reference quarter. In view of the increasing demand for timely GDP estimates in recent years, DOS also releases (since 2Q 2000) advance estimates of quarterly output-based GDP estimates at 1990 market prices. Advance GDP estimates are published no later than ten days after the end of the reference quarter.

Coverage

5. The categories for which advance GDP estimates data are published include: Goods Producing Industries, Services Producing Industries and Gross Domestic Product. In the preliminary releases, the full output-based GDP estimates are disseminated showing a breakdown by productive activity in accordance with the Singapore Standard Industrial Classification 1996.

6. Data on the expenditure-based constant price GDP are disseminated showing the following breakdown; private consumption expenditure; government consumption expenditure; gross fixed capital formation; increase in stocks; and net exports of goods and services.

Approach Adopted for Rebasing

7. DOS rebases its constant price GDP estimates once every five years. The procedure depends on the method used to compile the constant price GDP estimates. The three approaches to GDP are reconciled through an input-output (or supply and use) table during the rebasing exercise. This serves to cross-validate and ensure the reliability of the estimates, which are derived from diverse and independent data sources.

GDP (Output Approach)

8. There are two methods used to derive the constant price output-based GDP estimates. The first is by deflating the current price values by relevant price indices. The second is by using actual physical quantities or relevant indicators of real output to extrapolate from the value of output in the base year.

9. Ideally, constant price output estimates of GDP should be computed using the “double deflation” method. However, due to its voluminous data requirement, this method has not been adopted. Instead, the “single deflation” method has been used. This involves deflating the current price estimates of value added by appropriate price indices.

GDP (Expenditure Approach)

10. Constant price GDP estimates by the expenditure approach is obtained by the deflation method. The deflators used include components of the Consumer Price Index, Wholesale Price Index as well as the implicit GDP deflator. The current market value of each component of expenditure at the most detailed level is deflated by an appropriate price index (at the required base year market prices). Total constant GDP is the sum of all such components compiled at the base year market prices.

Rebasing

11. Constant price GDP estimates compiled using deflation are recomputed using price indices which are rebased to the new reference base year. Similarly, constant price GDP estimates compiled using extrapolation are recomputed using quantity indices which have been rebased to the new reference base year.

Linking of Series on Different Bases

12. The purpose of rebasing is to obtain and use a base year price structure which is more representative for the current period. As it is not meaningful to revalue all historical estimates at the base year price, the new price structure is applied only to the estimates of the base year and after. To provide a continuous time series, constant price estimates are linked at the new base year at both the aggregate level and at the sectoral level (eg manufacturing). The constant price GDP estimates are, in effect, chain-linked indices with the linking done each time the national accounts are rebased.

Our approach is illustrated by reference to the rebasing of our constant price GDP estimates to reference year 1990, which was completed in 1996. The formula adopted to link the constant price 1990 series to the previous constant price 1985 series is:

$$E_{90}^x = E_{85}^x X \frac{E_{90}^{90}}{E_{85}^{90}}$$

where E_{yy}^x is the estimate of year x in base year yy prices.

13. This method preserves the growth rates associated with the previous base year. However, since the GDP estimates at aggregate level for years prior to 1990 were re-scaled to 1990 prices independently of their components, the components do not add up to the total. One way of eliminating the discrepancy is to derive the totals by adding up the components. In this way, the earlier base year's price structure would not be retained and this would defeat the purpose of rebasing.

14. DOS has adopted the 1993 SNA (*Para 16.39*) recommendation that linked series should preserve the price structure of the period closer to them at the expense of additivity. Hence, no adjustment is made for the discrepancy in the linked series.

Improvements in Coverage and Data Sources

15. In the rebasing exercise to reference year 1990, improvements in coverage and data sources have been reviewed and incorporated. In addition, the conceptual treatment of new and emerging activities are considered and incorporated into the system. Timely and reliable indicators of new activities of growing importance were explored and adopted for the estimation of constant price estimates.

16. Revisions in treatment, classifications and some national accounting concepts have been incorporated to conform to the revised international standards, the 1993 United Nations System of National Accounts (SNA93). For example, government subventions to restructured hospitals and child-care centres have been reclassified from “current transfers from government to these institutions” to “social transfers in kind from government to households”. This reclassification is in line with the observation that the direct beneficiaries of these subventions are the individuals (households) and not the organisations themselves.

17. In line with the SNA93’s recommendation that taxes on production are payable when the good is used by households for their own consumption, additional registration fees (ARFs) on motor vehicles and certificates of entitlement (COEs) paid by households have been reclassified as taxes on production. Previously, ARFs paid by households were classified as other current taxes, while COEs as compulsory fees.

Impact of Rebasing

18. Growth in constant price GDP is regarded as real economic growth and used as a measure of economic performance. The impact of rebasing on historical growth rates could be due to two factors: (a) changes in price structure; and (b) reclassification and conceptual changes. Our analysis shows that for the last rebasing exercise, the impact on the economy’s overall growth rates arising from (a) has been relatively small. The growth rates of individual economic sectors show greater variations. Consequently, the contribution to growth of constant price GDP estimates by different economic sectors differ.

19. For (b), the greatest impact arose from the re-classification of ARF and COE. This re-classification has resulted in a significant change in the composition of the final demand components. The share of private consumption expenditure (PCE) has increased significantly, due to the sharp escalation in COE premiums.

Future Plans

20. DOS is presently rebasing its national accounts to reference year 1995. This exercise is expected to be completed later this year.