

NOTES ON METHODOLOGY

BACK-SERIES OF NATIONAL ACCOUNTS (Base 2011-12)

1. Brief Background

1.1 The work on national income estimation in India has a long history. Before 1949, it was the individual economists and research workers who had attempted to estimate the income of the country. These estimates were, however, not comparable owing to differences in the sources used for data and the assumptions made wherever the requisite data were not available. However, notwithstanding their limitations, these studies provided a foundation for the scientific preparation of official estimates of national income subsequently.

1.2 In order to provide estimates of national income on a regular basis, Government of India set up a High Powered Expert Committee in 1949, known as the National Income Committee, which was headed by the eminent statistician Prof. P.C. Mahalanobis, with Prof. D.R. Gadgil and Prof. V.K.R.V. Rao as Members. The Committee also had the benefit of receiving advisory help of international experts namely Professor Simon Kuznets, National Bureau of Economic Research, U.S.A; Prof. J.R.N. Stone, Department of Applied Economics, University of Cambridge and Dr. J.B.D. Derksen, National Income Unit, United Nations Statistical Office. The estimates of national income and details of methodology adopted were published in the First and Final reports of the National Income Committee, respectively brought out in April 1951 and February 1954.

1.3 As per the methodology and the pattern of presentation recommended by the National Income Committee, the first official estimates of national income were prepared with base year 1948-49. These estimates at constant (1948-49) prices, along with the corresponding estimates at current prices and the accounts of the Public Authorities, were published in the publication, 'Estimates of National Income' in 1956. This series, commonly known as the 'conventional series', was continued to be published till 1966 under the same title.

1.4 Simultaneously, work on estimation of related aggregates like 'capital formation' and 'saving' for the years 1960-61 to 1965-66 was also undertaken. Estimates of capital formation and saving were published along with the methodology of their compilation, for the first time in 1969. The coverage of the publication was extended gradually from time to time, to incorporate the estimates of private consumption expenditure, saving, capital formation, factor incomes, consolidated accounts of the nation and detailed accounts of the public sector. The title of the publication was, therefore, again changed to the present title 'National Accounts Statistics' (NAS) with effect from January 1975 to depict the expanded scope of the publication.

2. Previous NAS Series

2.1 Base year of National Accounts Estimates have been periodically updated, as presented below:

| Base Year | Year Introduced |
|------------------|------------------------|
| 1948-49 | 1956 |
| 1960-61 | 1967 |
| 1970-71 | 1978 |
| 1980-81 | 1988 |
| 1993-94 | 1999 |
| 1999-2000 | 2006 |
| 2004-2005 | 2010 |
| 2011-2012 | 2015 |

3. Back Series (2011-12 Base)

3.1 At the time of revising the NAS series, the National Statistical Office (NSO) undertakes a comprehensive review of databases and the methodology employed in the estimation of various macro-economic aggregates. Major changes in the choice of alternative sets of data or methodologies are also considered for inclusion in the NAS, at the time of the base year revision exercise. It has been the practice not to make changes every now and then and necessary major changes are kept for implementation at the time of base year revision exercise.

3.2 In the past, National Accounts Statistics were revised decennially changing the base to a year, which ends with '1'. It was primarily because in the base year estimates of national accounts aggregates, the information on work force plays an important role and work force estimates were obtained from the Population Census conducted decennially in the years ending with '1'. This practice continued up to the series with base year 1980-81. Thereafter, the work force estimates from the results of Quinquennial Employment and Unemployment Surveys conducted, once in nearly every five years came to be used in the National Accounts, and consequently the base years of national accounts statistics also started getting revised every five years coinciding with the years of the Employment and Unemployment Surveys.

3.3 The current NAS series, with base year 2011-12, was introduced in January 2015. In the re-basing exercise, the three major considerations influencing the present revision exercise include (i) revision of base year to a more recent year (for meaningful analysis of structural

changes in the economy in real terms), (ii) complete review of the existing data base and methodology employed in the estimation of various macro-economic aggregates including choice of the alternative databases on individual subjects and (iii) implementing the recommendations of the System of National Accounts (SNA), 2008; to the extent data was available. The details on the revision incorporated in the 2011-12 base have been published in the “Change in Methodology and Data Sources in the New Series of National Accounts- Base year 2011-12 (June 2015)” and the same is also available on the Ministry’s website at http://www.mospi.gov.in/sites/default/files/press_releases_statements/Changes%20in%20Methodology%20NS%202011-12%20June%202015.pdf . Some of the salient data/methodological changes adopted in the 2011-12 series are:

- Valuation of various GVA, NVA and related aggregates at basic prices and GDP at market prices instead of factor cost approach adopted hitherto.
- Institutional sector-wise compilation of estimates – Non-financial and financial Corporations, General Government and Households.
- Use of Enterprise Approach, instead of the earlier Establishment approach.
- Use of MCA-21 database in respect of private corporate sector.

4. Compilation of Linked Series

4.1 Whenever a new series of NAS is introduced with an updated base period, it is customary to link the old series to the series on the new base period. For the compilation of a linked series (in this case for the years 1950-51 to 2003-04), the two standard concepts used are the splicing method, and reworking the estimates as per the current series methodology, at the component or detailed item level. The major problem in compiling back-series estimates is in maintaining the growth rates of earlier series (volume movements in the case of constant price estimates) at not only the component level, but also at each level of aggregation. If the growth rates are maintained at component level and at each level of aggregation, the components will not add up to the aggregate level, which means that there is loss of additivity between the components and at the aggregate level. On the other hand if the growth rates are maintained at the component level, and the aggregate is derived as a sum of the components, the growth rates of the aggregates in the linked series will be different from those in the earlier series.

4.2 Keeping in view the above stated difficulties in compiling the back-series estimates and the need to account for the expanded coverage as well as the new data sources in the linked series, the following guidelines have been adopted for the compilation of present linked series, for the years 1950-51 to 2010-11:

- linked series must begin from the earliest year of the previous NAS series, i.e. 1950-51.
- additional coverage of activities that were introduced in the NAS in the new series need also to be accounted for, in all the previous years in which these activities were in existence in the economy.

- linked series of NAS need to be compiled using the same methodology as adopted for the current series. This implies that there would be some changes in the growth rates of various aggregates for the same years between the old series and new series. However, additivity of detailed estimates with the aggregates will be maintained during 2004-05 to 2011-12.
- For the years prior to 2004-05, estimates at detailed and aggregate levels are to be compiled by adopting the splicing method. This implies that there would be no change in the growth rates of aggregates for the same years between the old series and new series. However, additivity of detailed estimates with the aggregates will not be maintained.
- basic identities of national accounts (for example, the Net Domestic Product is derived as Gross Domestic Product minus Consumption of Fixed Capital) to be kept intact.

4.3 Following the above guidelines, linking exercise of NAS series has been carried out, separately for two distinct periods, namely (a) the series for the years 2004-05 and onwards, and (b) the series prior to 2004-05.

4.4 However, the current series, in terms of methodology as well as the data sources, incorporates significant departures from 2004-05 series. Therefore, owing to data limitations and structural changes as recommended in SNA-2008, the compilation of estimates required extensive exercises, especially for the estimates for the period 2004-05 to 2010-11, as it was proposed to be based on the methodologies similar to that of 2011-12 series. For the Private Corporate part, the current series has made use of MCA-21 database, which stabilized only after the year 2010-11. In the absence of stable MCA-21 data for the years prior to 2010-11, alternative exercises were undertaken using different approaches. The methodology of estimation of Back Series was deliberated in the Advisory Committee on National Accounts Statistics (ACNAS). The available alternatives were critically examined and it emerged that a single uniform approach across all the sectors may not be appropriate and a mixed approach would be inevitable for the estimation of back series.

4.5 Accordingly, for the compilation of the back series (in this case for the years 2004-05 to 2010-11), a hybrid approach has been used and the splicing method has been used for the years prior to 2004-05. Keeping in view the above stated difficulties in compiling the back-series estimates, and the need to account for the expanded coverage and the new data sources, approach of current series, to the extent possible, has been adopted for the period 2004-05 to 2010-11 resulting into changes in the growth rates of various aggregates in comparison to old series. However, the additivity of the aggregates (with its constituents) is kept intact. In few sectors, departure from this procedure has been made, and primarily splicing technique has been adopted to arrive at the estimates.

4.6 The detailed methodology for Back Series for the period 2004-05 to 2010-11 is available on the Ministry's website at http://www.mospi.gov.in/sites/default/files/publication_reports/Methodology_back_series_base_2011_12_9jan19.pdf

4.7 For the years prior to 2004-05, estimates are compiled by adopting the splicing method, retaining same growth rates of aggregates as that of old series. As a result, the aggregates for 1950-51 to 2003-04 are non-additive with their respective components.

4.8 Moreover, separate estimate for a few crops were published for the first time in the 2011-12 series. For these crops, back-series estimates for the years 1950-51 to 2003-04 as per new base (2011-12) have been prepared using growth rate of the sub-group of crops in which it was a part in earlier back-series (2004-05 base). For example, back-series estimates of moth, val, rajma, cowpea, chola, lakh/khesri, peas/chawali, batna and other pulses have been prepared by using growth rates of other pulses observed in the previous series. A similar approach has been followed for preparing estimates of various 'other' fruits/vegetables/pulses, whose estimates were published for the first time in 2011-12 base, for the years 2004-05 to 2010-11. Similarly, the estimates of stock exchanges, stock broking companies and asset management companies have been computed as 2% of the GVA of the remaining financial sector for all the years between 1950-51 to 2004-05. This has been done since these enterprises were included in the estimates of financial corporation for the first time in 2011-12 base when the contribution of these segments was found to be 2% of remaining financial sector.

5. Construction

5.1 Back Series estimates of Construction Output, GVA and New Construction from 1950-51 to 2010-11 have been prepared by splicing. Repair & Maintenance has been prepared as the difference between total construction output and new construction part of DOBS, plantation and mineral exploration for both current and constant 2011-12 prices.

6. Gross Fixed Capital Formation (GFCF)

6.1 The GFCF estimates at current and constant 2011-12 prices are prepared for the years 1950-51 to 2010-11 using splicing method for each component. At the industry and overall level, the estimates are additive.

7. Consumption of Fixed Capital (CFC), Net Fixed Capital Stock (NFCS) and Inventory

7.1 The Consumption of Fixed Capital (CFC), Net Fixed Capital Stock (NFCS) and Inventory estimates at current and constant 2011-12 prices are prepared for the years 1950-51 to 2010-11 using splicing method at the component level. At the industry and overall level, the back series estimates are additive.

8. Change in Stocks (CIS)

8.1 The estimates of change in stock for the years 1950-51 to 2010-11 have been prepared by splicing at the component level in the each industry. At the industry and overall level, the back series estimates are additive.

9. Savings

9.1 The estimates of the domestic savings for the years 1950-51 to 2010-11 have been revised mainly on account of revisions in estimates of household saving in physical assets and saving of public sector. The estimates of household savings in physical assets and public sector savings have been compiled using the splicing. Expenditure of households on valuables has been included as savings in the form of physical assets of households. Household financial savings and private corporate sector (joint stock companies & cooperatives) savings have been same as published in the old series.

10. Valuables

10.1 As per recommendation of SNA-1993, compilation of 'valuables' as a separate category of expenditure was started from 1999-2000 only. Valuables' estimates of back series have been compiled using splicing.

11. Exports & Imports

11.1 Export and Import of Goods & Services at current prices were taken as published in "NAS 2014" and "National Accounts Statistics Back Series 1950-51 to 2004-05". Constant (2011-12) prices estimate has been generated through splicing.
