NOTES ON METHODOLOGY

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 with each other because of the differences in the sources used for data and assumptions made wherever requisite data were not available. Notwithstanding these limitations, these studies provided a foundation for the scientific preparation of official estimates of national income.

1.2   In order to provide estimates of national income on a regular basis, the Government of India set up a High Powered Expert Committee in 1949, known as the National Income Committee. The National Income Committee 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 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. It was for the first time that this Committee provided the estimates of national income for the entire Indian Union. 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 by the Central Statistical Organisation (CSO) with base year 1948-49 for the estimates at constant prices. These estimates at constant (1948-49) prices alongwith 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 The first NAS series of India was with the base year 1948-49, which was followed by a series with the base year 1960-61 in 1967. The base year of the NAS series was further revised from 1960-61 to 1970-71 in January 1978, from 1970-71 to 1980-81 in February, 1988, 1980-81 to 1993-94 in February 1999, and lastly from 1993-94 to 1999-2000 in January 2006 .

3. Current NAS Series

3.1 At the time of revising the NAS series, the CSO 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 by the CSO for inclusion in the NAS, at the time of the base year revision exercise. It has been a 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 The Current NAS series is with the base year 1999-2000. This series was introduced in January 2006. In this re-basing exercise, the CSO was mainly guided by four considerations, namely; (i) revision of base year to a more recent year (for meaningful analysis of structural changes in the economy), (ii) complete review of the existing data base and methodology employed in the estimation of various macro-economic aggregates, including the choice of alternative databases on individual subjects, (iii) enlargement of coverage in the NAS so as to reckon with, the new economic activities in the economy, and (iv) to the extent the data are available, implementing the recommendations of the 1993 System of National Accounts (1993 SNA), which was prepared under the auspices of the Inter-Secretariat Working Group on National Accounts comprising of the United Nations, International Monetary Fund (IMF), World Bank, Organisation for Economic Cooperation and Development (OECD) and the European Communities (EUROSTAT).

3.3 In the past, National Accounts Statistics have mostly been revised decennially changing the base to a year synchronizing with the year of decennial Population Census. It was primarily because in the base year estimates, the information on work force has played an important role and workforce estimates were obtained from the Population Census which are conducted decennially in the years ending with 1. As a sequel to this sequence, the previous series of National Accounts Statistics should have

been with the base year 1990-91. At that time, it was observed that besides the Population Census, estimates of working force are also available from the large scale sample surveys on employment and unemployment, which are conducted quinquennially by the National Sample Survey Organisation (NSSO) of the Ministry of Statistics and Programme Implementation. The advantages of using the NSSO data are that (i) they capture adequately the data on working force as compared to that in the Population Census, mainly due to the strength of qualified and trained investigators, and (ii) they are the available at 5-yearly intervals, as compared to the 10-year periodicity in the case of Population Census, which would enable the CSO to rebase the NAS series more frequently. Accordingly, the CSO used the workforce estimates based on National Sample Survey (NSS) workforce participation rates from the NSS 1993-94 (50th Round) survey results, and revised the base year of national accounts to 1993-94.

3.4 In continuation with this practice, the new series of national accounts released on 31st January, 2006 adopted 1999-2000 as the base year, as it has used the data on WPR from the NSS 55th round quinquennial survey on Employment and Unemployment, conducted in 1999-2000. In the new series, the WPR data has been used in conjunction with population data of the Population Census, 2001.

3.5 In the new series, efforts have been made to make use of as much current data as possible. Further, the results of latest available surveys have also been made use of. Some of the important sources of data, which have been utilised in the new series, are as follows:

(i)   Quinquennial Survey on Employment and Un-employment, 1999-2000 (55th round), NSSO;
(ii) Survey on Unorganised Manufacturing, 2000-01 (56th round), NSSO;
(iii) Survey on Services Sectors, 2001-02 (57th round), NSSO;
(iv) Survey on Housing Conditions, 2002-03 (58th round), NSSO;
(v)   All India Livestock Census, 2003, Department of Animal Husbandry, Dairying and Fisheries;
(vi) Population Census, 2001, Registrar General of India;
(vii) All India Census of Small Scale Industries, 2001-02, Development Commissioner, Small Scale Industries, Ministry of Small Scale Industries;
(viii) Employment Review - published annually by the Directorate General of Employment and Training (DGET), Ministry of Labour;

(ix) Indian Horticulture Database 2004, brought out by the National Horticulture Board (NHB);

(x) Hand Book on Fisheries Statistics, 2004, published by Department of Animal Husbandry, Dairying and Fisheries;

(xi) Operational Land Holdings and Livestock Holding Survey, 1991-92 (48th round), NSSO;

(xii) Administrative records of the Ministry of Non-Conventional Energy Sources for information on Gobar gas plants, Wind Energy Systems;

(xiii) Quinquennial Survey on Consumer Expenditure, 1999-2000 (55th round), NSSO;

(xiv) All India Debt and Investment Survey (AIDIS) 1991-92, NSSO;

(xv) Annual Accounts of the Employee's Provident Fund Organisation (EPFO)

(xvi) Cost of Cultivation Studies(CCS) of the Ministry of Agriculture;

(xvii) Cost structure of Wind Energy system, Plantation crops, NABARD.

3.6   In addition to using the results of above surveys and censuses, the CSO entrusted a number of studies to the State Governments, the Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture (DESAg) and the Socio-Economic Research Centre (SERC), a Delhi based NGO, for updating the rates and ratios used in the compilation of national accounts. The CSO also conducted a study on yield rates of meat, meat products and meat by-products through its own personnel to update the old rates and ratios for these items. The results of the type studies considered for incorporation in the new series relate to those conducted by (i) SERC on rates and ratios in agriculture sector, (ii) CSO on yield rates for meat, meat products and meat by-products, (iii) CSO on yield rates of camel hair and pig bristles, (iv) DESAg on market charges paid by the farmers, (v) Directorate of Economics and Statistics, Government of Haryana, on input rates for inland fishing, and (vi) Indian Council for Forest Research Education (ICFRE) on output of forest products.

3.7   At the time of introducing the new series in January, 2006 , estimates of GDP and other macro-aggregates were compiled on all-India basis for the years 1999-2000 onwards.   These estimates were presented in the CSO's publication "National Accounts Statistics, (Base Year 1999-2000)". With the availability of detailed data obtained from the results of NSSO's surveys on All India Debt and Investment Survey (AIDIS) 2002-03, these estimates for the years 1999-2000 onwards had undergone some changes. These revised estimates for the years 1999-2000 onwards were presented in the publication

"National Accounts Statistics, 2007" which is available in the ministry's website. Following the firming up of these estimates for the year 1999-2000, the CSO began the exercises of compiling the estimates for the years prior to 1999-2000, as the compilation of back-series estimates depended on the final estimates of all the aggregates for the year 1999-2000.

4.   Compilation of Linked Series

4.1   Whenever a new series of NAS is introduced with an updated base period, it is customary for the CSO 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 1998-99), the available two standard concepts 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. This is because the weighting diagram in the new series is the prices of different components in the new base year. The growth rates of the aggregates in the back-years in the new series are now influenced by the price structure of the components of the new base year.

4.2   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 in the linked series, the CSO has adopted the following guidelines for the compilation of present linked series, for the years 1950-51 to 1998-99

- linked series must begin from the earliest year of the previous NAS series, i.e. 1950-51.

- additional coverage of activities (for example, software and communication services) that has been 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.

- results of benchmark surveys adopted in the new series are also to be used for compiling annual estimates of previous years, through

interpolation techniques. In the old series, the earlier benchmark survey was used and annual estimates for subsequent years were estimated through extrapolation techniques.

- linked series of NAS need to be compiled using the same methodology as adopted for the current series, upto the year 1980-81. 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.

- For the years prior to 1980-81, 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, the CSO carried out the linking of NAS series exercise, separately for two distinct periods, namely (a) the series, for the years 1980-81 and onwards, and (b) the series, prior to 1980-81.

4.4   For the years 1980-81 to 1998-99, the methodology followed for linking exercise is, by and large, the same as the one adopted for the new series of NAS. In few sectors, departure from this procedure has been made, the details of which and the reasons for the departure have been indicated in the write-up of these sectors. For these years, besides accounting for the additional coverage in the linked series, the CSO has also used the results of all benchmark surveys, so that annual estimates are made through interpolation techniques (in the previous series they were made through extrapolation as results of the benchmark surveys used for the new series were then not available).

4.5   For the years prior to 1980-81, the estimates have been prepared by using the splicing technique. The splicing technique has been adopted for the years prior to 1980-81 mainly with the purpose of maintaining the growth rates of the old series at detailed and at aggregate level. Therefore, the data are non-additive between the detailed level and the aggregate level, for the years 1950-51 to 1979-80.

4.6   The detailed methodology that has been adopted for compiling the back-series estimates for the years 1980-81 to 1998-99 for each of the aggregate and at sectoral level, is indicated in the following paragraphs:

(A) ESTIMATES OF GROSS DOMESTIC PRODUCT

agriculture including livestock

4.7   The agriculture sector comprises agriculture proper, livestock and livestock products and operations of Government irrigation system. In the new series the following important changes with respect to methodology, source of data,etc. have occurred:

cereals, pulses, oilseeds, sugars, fibres, indigo, and condiments and spices crops

4.7.1 In the old series, valuation of cereal crops for the non-procured quantities was done on the basis of price data provided by the States. However, in cases where the prices reported by the States for non-procured quantities was less than the Minimum Support Price (MSP) for paddy and wheat crops, the MSP was adopted for valuing these crops. The Sub-Committee under the Chairmanship of Shri Pratap Narain, which had representatives from the Commission for Agricultural Costs and Prices (CACP) and the DESAg recommended that the price data furnished by the States might be applied for non-procured quantities, even if they were below the MSP. This recommendation is adopted in the new series by the Advisory Committee on National Accounts. The changes in other crop-groups are marginal.

drugs and narcotics crops

4.7.2 The production of betel leaf in Assam was not included in the estimates of value of output of the State. The same has now been included in the new series at the suggestion of the Directorate of Economics and Statistics (DES), Assam.

fruits and vegetables

4.7.3 One of the terms of reference for the Sub-Committee under the Chairmanship of Shri Pratap Narain, was to examine the available databases on horticultural crops and recommend appropriate sources of data on production and prices for these crops. In the old series, the sources for production data for fruits and vegetables were (i) DESAg for the 5 principal crops of banana, potato, onion, tapioca and sweet potato, (ii) State governments implementing the centrally sponsored plan scheme, "Crop

estimation survey on Fruits, Vegetables and minor crops" for 11 crops, and (iii) the National Horticulture Board (NHB) for all other crops. For valuing these crops, price data provided by the State governments in respect of (i) and (ii) and the NHB data on prices for (iii) was used. The Sub-Committee examined this issue at length in consultation with all concerned and observed that the Ministry of Agriculture treated the NHB data as official data and maintained that the plan scheme Crop Estimation Survey for Fruits and Vegetables and other minor crops (CES-F&V) had not yet been evaluated in terms of quality of data generated by it. The Sub-committee, therefore, recommended that the NHB data on production might be used by the CSO in respect of horticultural crops (other than those covered under principal crops). For valuing these crops, the Sub-committee recommended adoption of price data provided by the state governments. This recommendation is adopted in the new series.

other crops

4.7.4   In the new series, there is updation of yield rate in respect of fodder crops. In the old series, the yield rates for fodder crops were based on old NSS survey results, and the yield rate used ranged from 2.82 tonne/ha. to 9.342 tonne/ha, across the States. For updating the rates and ratios used in agriculture sector, a type study was entrusted to the Socio Economic Research Centre (SERC). The SERC study gave new yield rates (state-wise) ranging from 30 tonne/ha to 70 tonne/ha; and also separately for irrigated areas at 50 tonne/ha and unirrigated areas at 25 tonne/ha. The new yield rates have been used in the new series for estimating the value of output of fodder crops. However, there has been no change in the GVA of agriculture sector due to adoption of the new yield rates for fodder crops, as entire output of fodder is treated as input in the agriculture sector as feed of livestock.

by-products

4.7.5 The latest data on cost of cultivation studies available from the DESAg have been used in the new series.

kitchen garden and toddy

4.7.6 In case of kitchen garden, state governments' prices for fruits and vegetables is adopted. In respect of toddy, this item has been included for the first time, at the instance of DES, Andhra Pradesh. The output of this is estimated through indirect methods on the basis of NSS consumption expenditure data.

milk

4.7.7 In the new series, coverage of milk production has been extended to goat milk, buffalo milk and camel milk (having economic value) in States,

where the same are presently not included in the total milk production, as per the state-wise details of production and livestock population provided by the Department of Animal Husbandry, Dairying and Fisheries (DAHD).

meat
4.7.8.   The following changes have been made under this item in the new series:
inclusion of meat production from places other than registered slaughter houses, in Tamil Nadu, Karnataka and Gujarat; and
revision of yield rates of meat products and meat by-products.

Presently, meat production from places other than registered slaughter houses in respect of the three States mentioned above is not included in the estimated meat production. The same has now been included in the new series. Also in the old series, the yield rates of meat products and meat by-products were based on old studies of Directorate of Marketing Intelligence (DMI). These rates have now been updated through the studies conducted by the CSO and the SERC. The results of both these studies show that the rates obtained through these studies are quite close to each other. While the SERC study is based on secondary sources, the CSO study is based on field survey and was carried out in several states in collaboration with the state DESs.

eggs
4.7.9   In the new series, production of duck eggs in States, where the same is presently not covered in the total egg production, have been included

wool, hair and pig bristles
4.7.10   For estimating the output of goat hair, camel hair and pig bristles, yield rates per animal, based on old DMI studies, were used in the 1993-94 series. The SERC in its study results gave an average yield rate of hair for single humped camel as 700 gm./animal/year and that of a double humped camel as 3.0 kg./animal/year. This data is based on secondary data source, the National Research Centre (NRC) on Camel, Bikaner (Rajasthan). However, the NRC on Camel has given the yield rate per camel per year for single humped camel as 800 gm. Using the data provided by the NRC, the yield rate of camel hair has been revised to 800 gm./year. For the yield rates of pig bristles, the CSO conducted a study on its own in the Pig Fair of Bhongaon, District Mainpuri, Uttar Pradesh. From this study, the average yield rate of pig hair per year is estimated at 155 gm, as against the yield rate of 92 grams used in the old series. The new yield rate has been used in the new series.

dung and increment in livestock

4.7.11   The latest 2003 livestock census data has been used to estimate the population of livestock and dung production in the new series.

inputs

4.7.12   Major changes in the new series under this are in the items, (i) seed, (ii) chemical fertilizers, (iii) feed of livestock, (iv) market charges and (v) financial intermediation services indirectly measured (FISIM). In respect of seed, the usage of seed rates based on the latest data from cost of cultivation studies is adopted. In respect of feed of livestock, there is an increase in the value of output of fodder crops, which has already been taken into account on the output side, as mentioned in para 4.7.4 above.

For estimating the market charges paid by the farmers, the CSO conducts a study through the DESAg, Ministry of Agriculture at the time of revising the base year. The rate used in the old series was 1.29 per cent of value of output of agricultural crops. This rate was based on the study conducted by the DESAg, during 1997-98, and was limited to two crops, paddy and wheat. However, the Ministry of Agriculture's recent study on this was extended to 8 crops, namely, paddy, wheat, maize, gram, ginger, mango, potato and onion. Based on the results of this study, the market charges paid by the farmers is estimated at 2.358 per cent of total value of output of agriculture sector. The new rate has been adopted for the new series.

To incorporate the changes in the backseries, the estimates of value of output and the value of inputs for all the items in the new series have been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated total value of output of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the values of output of individual items.

forestry and logging

4.8   Estimates of value of output and the value of inputs for all the items even on which no changes have been made in the new series either with regard to the coverage or data sources, have been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated total value of output of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the values of output of individual items.

fishing

4.9   In the new series, the data on prices provided by the State governments, and in particular to those relating to prawns have been adopted. Estimates of value of output and the value of inputs for all the items even on which no changes have been made in the new series either with regard to the coverage or data sources, have been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated total value of output of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the values of output of individual items.

mining

4.10   The economic activity of salt production by solar evaporation has been included in the coverage of national accounts in the new series. Salt mining and quarrying including crushing, screening and evaporating in pans was covered under the 3-digit code 154 (mining sector) in NIC, 1987, while the 3-digit code 208 (manufacturing sector) was covering production of common salt. On the other hand, in the NIC, 1998, extraction of salt, including salt mining, crushing and screening and salt production by solar evaporation of sea water, like brine or other natural brines, is covered under the code 14220 (mining sector), while code 24298 (manufacturing sector) covered manufacture of processed salt. It was observed that though data on rock salt production as provided by the IBM was covered in the GDP estimates of mining and quarrying sector, salt production by evaporation of sea water, pan drying was not being covered in the old series. This economic activity has now been included in the new series on the basis data available from the Office of the Salt Commissioner.

Estimates of value of output and the value of inputs for all the items even on which no changes have been made in the new series either with regard to the coverage or data sources, have been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated total value of output of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the values of output of individual items.

manufacturing (registered)

4.11   The changes made in this sector in the new series relate to (i) adoption of National Industrial Classification, 1998 (NIC 1998) in place of NIC 1987 which was followed in old series, (ii) inclusion of the activities of currency, coinage and mint units under public sector, and (iii) exclusion of industry group "repair services" (3-digit codes 394, 398 and 97 under NIC 1987) as a result of adopting the NIC 1998 classification. Estimates of value of output and the value of inputs

for all the items even on which no changes have been made in the new series either with regard to the coverage or data sources, have been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated total value of output of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the values of output of individual items.

manufacturing (unregistered)
4.12   The repair services (NIC 1998 code 502+526) have been shifted to the trade sector as per NIC 1998. Estimates of value of output and the value of inputs for all the items even on which no changes have been made in the new series either with regard to the coverage or data sources, have been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated total value of output of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the values of output of individual items.

electricity, gas & water supply
electricity
4.13   There is no change in the estimates of GDP at current prices between the old series and the back-series for all the years. Estimates at constant (1999-2000) prices have been obtained by the method of splicing.

gas
4.14   GDP estimates of gas sub-sector at current prices have been prepared by the splicing method. Estimates of GDP at constant (1999-2000) prices for the back-series have also been obtained by the splicing method.

water supply
4.15   There is no change in the estimates of GDP for the back-series at current prices. Estimates of GDP for the back-series at constant (1999-2000) prices have been obtained by the splicing method.

construction
4.16   The estimates of GDP for the years 1993-94 to 1998-99 are based on procedure followed for revised base (1999-00) of NAS and interpolation of AIDIS results 1991-92 and 2002-03. For the earlier years 1950-51 to 1992-93, the estimates of GDP have been prepared by splicing method. The estimates of GDP at constant (1999-2000) prices have been made by applying appropriate price deflators on the estimates at current prices, as per the methodology adopted in the new series.

trade, hotels and restaurants

4.17.1 *trade sector*

The Trade sector includes wholesale and retail trade in all commodities whether produced domestically, imported or exported. It also includes the activities of purchase and selling agents, brokers and auctioneers. In the old series, the GDP estimates were prepared for the trade sector as a whole covering categories (NIC 1987 codes of 6, excluding 69, 840, 841, and 890). The bench mark year estimates of GDP for this sector in the old series were prepared separately for the public sector, private organized sector and private unorganized sector. While, estimates of GDP relating to public sector trading units were based on analysis of accounts of public sector trading enterprises and budget documents, private organized segment had two components namely, private corporate and cooperatives. The estimates of private corporate sector were based on the results of Reserve Bank of India's (RBI) sample study (inflated by paid-up capital data obtained from the Ministry of Company Affairs), whereas the estimates for cooperative societies of organized trading activity were based on the data provided by the National Bank for Agriculture and Rural Development (NABARD). The private unorganized sector estimates were compiled using the estimates of the corresponding workforce separately for rural and urban areas and the estimate of value added per worker derived from Directory Trade Establishments (DTE) survey, 1996-97 and Non-Directory Trade Establishment (NDTE) survey, 1997. The workforce estimates were prepared using Employment-Unemployment Survey of 50th round (1993-94) along with Population Census, 1991. The workforce for private unorganized sector was obtained as a residual from the estimated workforce in trade sector, by subtracting the estimated employment in public sector (assumed to be only in urban areas) and private organized sector, data on both these segments is available from the Directorate General of Employment and Training (DGET).

In the new series, there is change in the coverage of trade sector. This sector now comprises the following five categories, as per NIC 1998 classification:

    (i)   502+50404, "Maintenance and repair of motor vehicles" (new item)

    (ii)   50-502-50404, "Sale of motor vehicles"

    (iii)   51+74991, "Whole sale trade except of motor vehicles + Auctioning activities"

    (iv)   526, "Repair of personal and household goods" (new item)

    (v)   52-526, "Retail trade (except motor vehicles)."

The GVA estimates of Trade sector have been prepared separately for:

(i) Public sector having units engaged in retail and whole sale trade (except of motor vehicles) + Auctioning activities;

(ii) Private Organised sector consisting of (a) Private Corporate units engaged in retail and wholesale trade (except of motor vehicles) + Auctioning activities, (b) Trading Co-operative units engaged in retail and wholesale trade (except of motor vehicles) + Auctioning activities, (c) Maintenance and repair of motor vehicles and (d) Repair of personal household goods;

(iii) Private Unorganised sector having units engaged in all the five categories.

The revision in GDP estimates of public, private and unorganized components in 1999-2000 in the new series has been due to the availability of latest data from different source agencies. For public sector trading units, estimates have been compiled by analysing the annual accounts of public trading enterprises and budget documents. Estimates for private organized (workforce from DGET source) part comprising private corporate sector and co-operative societies engaged in trade have been prepared for 1999-2000 using the results of the RBI study on company finances, total paid-up capital of companies available from Ministry of Company Affairs and information available from the NABARD publication entitled "Statistical statements relating to the Co-operative movement in India 1999-2000".

The contribution of the unorganized segment has been estimated as a product of workforce and value added per worker. The workforce estimates have been prepared using the results of NSS 55th round survey on Employment-Unemployment (WPRs), 1999-2000 along with the data on population from the Population Census 2001. The estimates of workforce of private unorganized part for all five categories (rural and urban) has been obtained for the benchmark year 1999-2000, by subtracting the estimated workforce in public sector and the private organized segment, available from DGET (assuming that DGET workforce includes the workforce of co-operative as well) from the total workforce of the sector. The GVA per worker used for the new series is that of 'all enterprises' category available in informal sector survey conducted in NSS 55th round (1999-2000).

It may be noted that in the new series for trading activity, the activities relating to NIC, 1998 codes, 502 and 526 have also been included for the first time.

The estimate of GDP in the new series has been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated GDP of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the component level estimates.

4.17.2 hotel & restaurants

This sector comprises activities covered in the categories 551 and 552 as per NIC, 1998. In 1993-94 series, hotel and restaurants corresponded to category 69 of NIC, 1987. The methodology followed for estimating GDP of public, private organized and private unorganized in the new series is the same as that of 1993-94 series. The revision in GDP estimates of public, private and unorganized components is due to latest data made available by different source agencies. For public sector, the estimates are based on analysis of annual accounts of public enterprises and budget documents. Estimates for private organized part have been prepared for 1999-2000 using the results for the RBI study on company finances, total paid-up capital of companies available from Ministry of Company Affairs. For private unorganized segment, in 1993-94 series, the GVA per worker was taken from Enterprise Survey of 1993-94 on 'Hotels, Restaurants and other lodging places'. The workforce estimates were prepared using EUS 50th round along with Population Census 1991. For the new series, GVA per worker from Enterprise survey conducted during 57th round (2001-02) of NSS and workforce estimates from Employment –Unemployment Survey, 1999-2000 along with Population Census 2001 have been used.

The estimate of GDP in the new series has been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated GDP of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the component level estimates.

transport by other (other than railways) means and storage
4.18   In the new series results of latest surveys have been used. In the 1993-94 series, the GVA per worker was taken from Enterprise Survey of 1993-94, whereas for the new series, the GVA per worker has been taken from the Enterprise Survey of NSS-57th round (2001-02).

In the 1993-94 series, GVA estimation for services incidental to transport (sub sector of transport by other means) was on the basis of annual data on commissions paid to the booking agencies by shipping companies

and air companies. Whereas in the 1999-2000 series, GVA estimate has been prepared by multiplying the workforce (duly adjusted for public sector) with GVA per worker available from the Enterprise Survey 2001-02 results for the respective NIC codes. The economic activities of Airport Authority were included under Air transport sub-sector in the 1993-94 series. This has now been shifted to the sub-sector 'service incidental to transport'. Similarly, supporting service to water transport which was part of water transport, has been shifted to 'service incidental to transport' in the new series.

The estimate of GDP in the new series has been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated GDP of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the component level estimates.

communication
4.19   private communication services
4.19.1   The economic activities covered under this sector are (i) Courier activities (NIC-98, code-64120), (ii) Activities of the cable operators (NIC-98, code-64204) and (iii) Other communication (NIC-1998, code- 642 (-) 64204). In the 1993-94 series, initially the estimates of GVA of private communication services as a whole for the base year 1993-94 were prepared using NSS based estimates of workforce and value added per worker from the Enterprise Survey, 1991-92. The private sector work force was obtained after subtracting the public sector work force of communication services taken from DGET publication "Employment Review" from the total work force of communication services. The methodology was reviewed and latest available data were used from the year 1997-98 onwards keeping in view the activities covered under "Private Communication" and separate estimates for cellular mobile, courier services, and public call office booths (PCOs) were compiled. Activity-wise methodology of estimation of GVA for the new series is given below.

Courier Services
4.19.2 The estimates of GVA for courier services for the year 1999-2000 have been compiled using the estimates of value added per worker (VAPW) from the results of NSS 57th round survey on services sectors, 2001-02 and workforce estimates mentioned in Section 2 above, separately for Rural/Urban/organized/un-organised segments. The organized sector estimate has been prepared using DGET workforce and corporate sector value added per worker from the results of NSS 57th round survey. The estimated GVA for the un-organised sector has been compiled by subtracting the estimated workforce in organized sector (DGET source) from the total workforce and

the estimated VAPW for un-organised sector from the results of NSS 57th round.

Activities of cable operators
4.19.3   The activities covered under this compilation category are the activities of cable operators, and the estimates of GVA for these services for the year 1999-2000 have been compiled using the estimated VAPW of rural/ urban from the NSS 57th round survey results and the estimated workforce in the economic activity. No separate estimates for this category were prepared in 1993-94 series.

Communication services other than those of couriers and cable operators
4.19.4   The activities covered under this compilation category are all communication activities in the private sector other than those of couriers and cable operators. This sub-sector covers the activities of cellular and basic telecom services, and the activities of PCOs. This category of activities corresponds to the 'PCO services and other communication services' of 1993-94 series of national accounts statistics (NAS).

4.19.5   The estimates of GVA for other communication services for the year 1999-2000 have been compiled using the estimated VAPW from NSS 57th round survey results and the estimated workforce in the activity, separately for Rural/Urban/organized/un-organised segments. The private organized sector estimates have been prepared using the data on estimated workforce (from the DGET source) and the estimated VAPW from NSS 57th round survey results in respect of corporate sector. There is a broader coverage of the activity in the new series. In the old series the estimates were prepared only for PCOs and cellular mobile services. In the new series the economic activities of internet, cyber cafés, etc. have also been included. Moreover, the difference between the extrapolated workforce estimate used in old series for the year 1999-2000 and the latest data available from the NSS 55th round for the year 1999-2000 has also been quite high.

The estimate of GDP in the new series has been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated GDP of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the component level estimates.

banking and insurance
4.20 *Banking department of RBI*
4.20.1   In the 1993-94 series, volume index prepared on the basis of deflated aggregate deposits and credits of all scheduled commercial banks was used to move the base year GVA, for arriving at the constant price

estimates of the Banking department of RBI. However, it has been observed that income of the RBI in the recent years is negative, as large part of its earnings are from foreign securities, which are out of the preview of GVA. Hence, the current price GVA of RBI's banking department is becoming negative in the recent years, whereas due to the method of moving the base year estimates by deflated aggregate deposits and credits of all scheduled commercial banks, the estimates of GVA at constant prices had been positive, thus resulting in an anomalous situation due to mis-match between current and constant price GVA estimates of the activity.

In the new series, the implicit price indices, as observed from current and constant price GVA estimates of commercial banks have been used to deflate current price estimates of GVA of Banking Department of RBI, to arrive at the constant price estimates of GVA for the Banking Department of RBI.

Life insurance
4.20.2   In the 1993-94 series, estimates of GVA for the activity at constant prices were prepared as cumulative amount of sum assured + bonuses and life fund at the end of the year, provided in the annual reports of LIC, deflated separately with the help of WPI. Two volume indices were constructed separately and averaged (simple average) to get a combined volume index. This combined Volume Index was used to move the base year value added of life insurance for subsequent years.

In the new series, the annual changes in the life fund and sum assured, have been deflated to get a volume index for these two separately. The simple average of two indices, one each for life fund and sum assured, thus prepared has been combined to get the volume index for moving the base year estimates of GVA of life insurance to obtain the estimates of GVA for subsequent years, at constant prices.

The estimate of GDP in the new series has been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated GDP of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the component level estimates.

real estate, ownership of dwellings, business & legal services
4.21 In the new series, research and scientific services have been included under "real estate, ownership of dwelling and business services sector", whereas the same was part of "other services" sector in the old series. The major data sources for estimating the GVA for this sector are, NSS 55th round survey on Employment and Unemployment, 1999-2000, and Population Census, 2001 for estimates of workforce and the results of NSS 57th round survey on services sector for estimates of VAPW, annual reports of software

companies, The National Association of Software and Service Companies (NASSCOM) data on output of software services, Population Census, 2001 for information on residential houses in urban and rural areas, and the results of NSS 55th round on consumer expenditure for estimates on rent per household, and various price indices, namely, CPI (agricultural labourers), CPI (industrial workers) and CPI (urban non-manual employees).

The estimate of GDP in the new series has been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated GDP of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the component level estimates.

other services
4.22   The economic activities covered under this sector are (i) coaching and tuition (NIC-98 codes 80903 and 80904), (ii) education excluding coaching and tuition (NIC-98 code 80 (-) 80903 (-) 80904), (iii) human health activities including veterinary activities, (iv) sewage and refuse disposal, sanitation activities (nic-98 code 90), (v) activities of membership organisations (+) social work (NIC-98, code 91+ 853), (vi) recreational cultural and sporting activities (NIC-98, code 92), (vii) washing and cleaning of textiles and fur products (NIC-98, code-9301), (viii) hair dressing and other beauty treatment (NIC-98, code 9302) (ix) funeral and related activities (NIC-98 code 9303+9309), (x) private households with employed person (NIC-98 code 95), (xi) custom tailoring (NIC-98, code 18105), and (xii) extra territorial organisations and bodies (NIC-98 code 99).

The method generally followed for estimation of value added for different categories of services in the non-public segment is the labour input method (estimated workforce multiplied by the average value added per person in the activity). For the public sector part, estimates are compiled by analyzing the budget documents of central and state governments and annual reports of public undertakings. For the private organized part, estimates of workforce are from the DGET source and the VAPW from the NSS 57th round in respect of the enterprises recorded as companies. For the private unorganized part, estimates of workforce are from the NSS 55th round (total workforce in each economic activity), reduced by the workforce in the public and private organised sectors (available from the DGET), and the VAPW from the NSS 57th round in respect of enterprises recorded as non-corporate. Following are the major data sources used for the compilation of estimates of GVA in the new series:

- NSS 55th round (1999-2000) EUS
- Population Census, 2001

- DGET-Employment Review, annual data
- NSS 57th round (2001-02) on services
- Budget documents and annual reports for data relating to activities of these services under public sector
- Consumer price indices of agricultural labourers and industrial workers

The estimate of GDP in the new series has been made by adopting the splicing method both at current and constant (1999-2000) prices. The estimated GDP of the sector, for the years 1980-81 to 1998-99, has been arrived at by aggregating the component level estimates.

public administration and defence
4.23 The estimates of GDP for the years 1980-81 to 1998-99 at current prices are the same as those in the old series. The estimates at constant (1999-2000) prices have been made by the method of splicing.

(B) FINANCIAL INTERMEDIARY SERVICES INDIRECTLY MEASURED (FISIM)
4.24 The revision in the estimates of FISIM is due to availability of additional annual accounts /fresh data and change of methodology adopted in new series FISIM estimates. The estimates of FISIM for the years 1950-51 to 1998-99 have been derived using the splicing technique. The back years FISIM estimates (current prices) have been deflated by the corresponding implicit price index of GDP relating to banking sector (excluding Post Office Saving Bank and Employees Provident Fund Organisation) to arrive at FISIM estimates at constant (1999-2000) prices.

(C) CONSUMPTION OF FIXED CAPITAL (CFC) AND NET FIXED CAPITAL STOCK (NFCS)
4.25 For deriving the estimates of various aggregates on net basis, CFC is subtracted from the gross value figures. Estimates of CFC from 1950-51 to 1998-99 have been estimated by the Perpetual Inventory Method, at industry level. The CFC at the aggregate level, both at current and constant prices, have been arrived at by adding the industry level estimates of CFC.

4.26 Estimates of NFCS are based on the expected life of each type of assets and have been generated by using the perpetual inventory method (PIM). The estimates of total NFCS have been derived by adding the component level estimates. Estimates of NFCS have been presented by type of institution from 1980-81 to 1998-99 and by industry from 1950-51 to 1998-99, at current and constant (1999-2000) prices.

(D) SAVING AND CAPITAL FORMATION

saving

4.27 The estimates of domestic saving for the years 1950-51 to 1998-99 have been revised mainly on account of revisions in the estimates of household saving in physical assets and saving of public sector. Corresponding changes in the estimates of capital formation necessitated adjustments in the estimates of domestic saving. The estimates relating to other components of saving are same as published in the old series.

Capital Formation

construction

4.28 The estimates of capital formation in construction at economy level have been prepared as indicated in para 4.16. The estimates of public and private corporate sector for the years 1950-51 to 1998-99 have been duly adjusted for capitalization of office expenses and construction respectively. The estimates for household sector have been arrived at as residual from the total capital formation estimates which are prepared by splicing method.

4.29 For the years 1993-94 to 1998-99 the estimates at current prices for accounted construction part (which are prepared by the commodity flow approach) have been prepared by following the procedure used in the revised base (1999-00) of NAS. The value of unaccounted construction in household sector for the years 1993-94 to 1998-99 have been made by interpolating the results of AIDIS 1991-92 & 2002-03 and revised norms of kutcha pucca construction. The estimates for earlier years (1950-51 to 1992-93) have been estimated by splicing method. The constant (1999-2000) price estimates have been prepared by using appropriate price deflators.

machinery & equipment

4.30 The estimates of capital formation in machinery and equipment, for the years 1950-51 to 1992-93 have been prepared by splicing method and for subsequent years (1993-94 to 1998-99) the estimates have been arrived at by following the methodology used in the new series of NAS. The estimates of public and private corporate sector have been duly adjusted for capitalization of office expenses and new companies under construction. Household sector's estimates have been taken as residual. For constant (1999-2000) price, the estimates have been prepared by deflating the estimates at current prices by appropriate price deflators.

change in stocks

4.31 The estimates of change in stock at current prices for the years 1950-51 to 1998-99 are the same as published in the old series. The estimates at

constant (1999-2000) prices have been prepared by using the implicit price indices of the old series.

(E) PUBLIC SECTOR TRANSACTIONS
4.32   The back series at constant prices (1999-2000) has been prepared by splicing technique. Estimates of gross/net domestic product and capital formation from public sector for the years 1960-61 to 1979-80 are given by economic activity and for the years 1980-81 to 1998-99 by economic activity and by type of institution.

(F) PRIVATE FINAL CONSUMPTION EXPENDITURE
4.33   The estimates of PFCE for the years prior to 1999-2000 both at current and constant price (1999-2000) have been arrived at by incorporating (a) the changes as far as possible on account of additional coverage, conceptual and methodological improvements and (b) using splicing technique at the disaggregated level.

PRESENTATION OF ESTIMATES
5.   This publication has been divided into five Sections. The first section covers the macro-economic aggregates at current and at constant (1999-2000) prices. In the second section estimates of Gross/Net domestic product by industry of origin have been presented. The third section covers estimates of consumption expenditure, capital formation (at current and constant (1999-2000) prices), capital stock and saving. The fourth and fifth sections present the public sector transactions and the disaggregation of domestic product for different industries at current and constant (1999-2000) prices, respectively, in the same format as the one adopted for the new series.

General notations
6.   A blank cell or a row indicates that the estimates for this entry/entries have not been prepared either because of conceptual reasons or the relevant data is not available. '-' indicates that the entry is 'nil' or negligible.