Estimation of Balanced GDP at Regional Level – Challenges

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Abstract

In 2008 System of National Accounts (SNA) there is no place for statistical discrepancies/errors and omissions in any of the accounts. All statistical discrepancies are to be reconciled in the balancing of Supply and Use Table (SUT). The supply and use of various products are reconciled in the SUT to arrive at the estimate of a balanced gross domestic product (GDP) that is unique whether judged from production or expenditure approach.

The reconciliation exercises in SUT have since been conducted successfully at national level in the Indian national accounts and the balanced GDP is obtained. The balanced GDP is used as a measure of income as per 2008 SNA to construct the sequence of income and accumulation accounts that provide important macro-economic aggregates like gross domestic product, gross national income, gross national disposable income, saving, net lending/ borrowing, capital formation, as the balancing items in the individual accounts.

The present paper discusses the SUT reconciliation exercise in the Indian context at national level and examines the challenges in obtaining a balanced GDP estimate at regional (State) level. A reasonably balanced GDP at State level is feasible provided the State level estimates of Gross Fixed Capital formation are made available.

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1.   Introduction

The basic requirement for attempting production and income accounts as recommended in the System of National Accounts, 2008 (*2008 SNA*) is to construct a balanced Supply and Use Table (SUT) that provides an unique and acceptable estimate of gross domestic product (GDP)

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of the economy. This unique or balanced estimate of the GDP that is basically obtained from the production data as an unduplicated but having complete coverage (market output, non-market output or output for self-consumption or capital formation) is a measure of production of the economy during the period. This measure of production of products is used as a proxy of income of the economy during the period to compile the various current income and accumulation accounts giving the important macro-economic aggregates of the economy finally providing the changes in assets and changes in liabilities and net worth that accrues during the accounting period to be placed in the balance sheet of the economy along with other changes in volumes and prices. Thus importantly a balanced SUT is must and a pre-requisite as per 2008 SNA for attempting the various income and accumulation accounts as a sequence of accounts without any statistical discrepancies/errors and omissions. Any statistical discrepancies/errors and omissions that appear in the supply and use of various products is to be reconciled in the SUT and SUT made an integral part of the process of compilation of national accounts statistics annually.

An estimate of GDP form a balanced SUT is unique since it satisfies the economic conceptual identity of unique estimate of GDP estimated from the production approach as well as the expenditure approach. It may be noted that as per the 1968 SNA consolidated accounts of the nation (*c.f. Annex. I*) which most developing countries, incidentally still follow, the national accounts statisticians quietly place the discrepancies observed between GDP and final expenditures estimates in Account-1, statistical discrepancies observed between national disposable income and its appropriation in Account-3, errors and omissions observed between capital formation and its financing in Account-5, and errors as adjustments of merchandise exports/imports to the change of ownership basis in Account-6 on External Transactions. As a contrast in the 2008 SNA that recommends compilation of the sequence of account (income accounts and accumulation accounts) separately for all institutional sectors, there is no place for statistical discrepancies/errors and omissions in any of the accounts. All statistical discrepancies/errors and omissions are supposed to have been reconciled in the balanced SUT. Thus annual construction of a balanced SUT is the most important task and a challenge to national accounts statisticians since it is the pre-requisite for implementing recommendations of the 2008 SNA to prepare the sequence of accounts that provide estimates of required important macro-economic aggregates such as Gross Domestic Product, Operating Surplus and Mixed Income, Gross National Income, Gross National Disposable Income, Final Consumption Expenditure, Saving, Gross Capital Formation, and net Lending/ Borrowing of the economy.

In this paper we propose to briefly summarize the Supply and Use Tables as per 2008 SNA, discuss the reconciliation of supply and use of various products, discuss reconciliation in SUT in the context of Indian national accounts, and finally discuss the challenges faced in the construction of SUT at regional (State) level and bring out a feasible methodology of reconciliation in SUT at regional level to provide an almost balanced GDP at State level.

2.   Supply and Use Table (SUT)

The Supply and Use Table (SUT) provides the framework for estimating GDP consistently from both the production and expenditure side. The balanced SUT provides consistency and coherency among the first three accounts of the 2008 SNA framework, namely Goods and Services Account, Production Account by industry and Generation of Income Account by industry. The SUTs are based on the principle that the amount of the product

available for use within the economy must have been supplied either by domestic production or by imports. The amount of product supplied must be used in the same accounting period for either or both of intermediate consumption and final uses which comprise final consumption expenditure by households, Non-Profit Institutions serving Households (NPISH) and General Government, Gross Capital Formation and exports. SUT is an integrated, first and important part of SNA which depicts interrelationship of industries in an economy with respect to the production and uses of their products as well as imports and exports. With a complete set of product balances SUT can be created. It exists in pairs with common valuation (usually purchaser's price) and level of detail for products identified. Looking into the structure of SUT, each industry (or industry group) is listed across the top in two tables depicting outputs produced in the Supply table and depicting inputs that are consumed in the Use table. SUT is often advocated as a compilation tool for data checking and reconciliation; and data gap filling.

Supply Table is in the form of products (commodities) by industries matrix showing which industry supplies or makes which product (s). Thus a row shows supply of a product (or product group) coming from main industry or other industries where it might be a by- product or from the rest of the world as imports. To make the supply of a product at purchaser's price adjustment is made by adding the taxes less subsidies on the products and trade and transport margins. Whereas industries are classified as per International Standard on Industrial Classification (ISIC) in columns, the products in rows are classified as per Common Product Classification (CPC). Imports are also to be classified as per CPC, harmonized to products considered though in the source data they would be as per the trade classification (Harmonized System or Standard International Trade Classification). For the Indian national accounts purposes the industries are classified as per National Industrial Classification (NIC); and products are classified as per the National Product Classification (NPC). Besides, industries are further classified for producing market products, products for own final use and non-market products because the valuation of products coming out of industries is different for market, non-market and own final use.

A Simplified Supply Table

Supplies	Industries 1 2 3……………………n	Imports (ROW)	Adjustments for Taxes on products, Trade, Transport margins	Total
Product 1	Output by product and industry	Imports by products	Taxes less subsidies on products, Trade, Transport margins	Total Supply by product at purchasers price
Product 2				
_				
Product m				
Total	Total output by industry	Total imports		Total Supply

A simplified Supply Table presented above shows industries in one column, actually comprising of several columns representing homogeneous industry groups by NIC and further

classified by market/non-market products. Similarly products are shown in rows of several homogeneous products classified by NPC which are recorded in actual basic prices.

Use Table is in form of a rectangular matrix with four quadrants. The upper left quadrant depicts use of different products by different groups of producing industries (units), thus showing intermediate consumption of industries (in columns) by products (in rows). The upper right quadrant shows final uses of different products (in rows) under final consumption expenditure (Households, NPISHs, General Government in separate columns), Gross Capital formation (Gross fixed Capital Formation (GFCF), Change in Inventories (CII), and Valuables in separate columns) and Exports. The lower left quadrant contains information of gross value added (GVA) to show components of income generated in different industry groups. The lower right quadrant is empty. A simplified use table, for illustration, is presented below where industries are shown in one column actually comprising of several columns representing homogeneous industry groups by NIC. Products are shown in rows classified by NPC presenting intermediate consumption of products by industries which are recorded in the use table.

A Simplified Use Table

Uses	Industries 1 2 3........................n	Final Consumption Expenditure	Gross Capital Formation	Exports (ROW)	Total
Product 1 Product 2 . .	Intermediate Consumption by product and industry	Final Cons. Exp. (HHs, NPISH, Gen Govt.) by product	Gross Capital Formation (GFCF, CIS, Valuables) by product	Exports by product	Total Use by product at purchasers price
Product m					
GVA by Components	Gross Value Added by industry				
Total	**Total inputs by industry**				

The products and industries in the use table are classified the same way as in the supply table. Both supply and use tables are product by industry matrices adopting same classifications for products as well as industries, the basic difference between the two tables is that whereas Supply Table contains information on outputs, the use table contains information on intermediate inputs. In the Use Table allocation of exports requires the same conversion of trade classifications (HS/SITC) codes to product classification (NPC) used for products desegregation. The final consumption is categorized into those of Households, NPISHs and General Government; and Gross Capital Formation into acquisition less disposal of gross fixed capital formation, changes in stocks and acquisition less disposal of valuables. All final use categories in columns record information product-wise as per NPC to have harmonized row entries. The value added part of the Use Table in the lower left quadrant shows GVA by industry also showing components of total gross value added/GDP as compensation of employees, taxes less

subsidies on production and imports, net mixed income, net operating surplus and consumption of fixed capital separately for each industry irrespective of the industry providing market production, production for own final use, and non-market production.

The Government Final Consumption Expenditure (GFCE) consists of expenditures incurred by general government on both individual and collective consumption of products/ goods and services. Household Final Consumption Expenditure (HFCE) consists of expenditure incurred by resident households on consumption goods or services and is the largest item among the final uses. Non-Profit Institutions serving Households (NPISH) final consumption expenditure include final consumption expenditure of trade unions, political parties, religious and charitable organizations, and sporting and recreational associations. In many economies including India, the final expenditure by NPISH is placed along with final consumption expenditure by Households as Private Final Consumption Expenditure (PFCE) but the SNA recommends showing their final consumption expenditure in a separate columns. Gross fixed capital formation (GFCF) is usually broken down into its usual components- residential and nonresidential buildings; other construction; machinery and equipment; and other GFCF, which consists mainly of the increase in stocks of certain types of farm animals, purchases and development of computer software, cost of Research & Development and costs of mineral exploration. CII may either be a positive or a negative entry. As a positive entry, change in stocks includes products produced or imported during the current period but have not yet been used during the period or will be used at a later period. As a negative entry, it includes products that were available from the earlier period and used up in the current period besides the current period domestic production and imports.

The upper part of the use matrix showing the flow of products classified as per NPC into the intermediate and final use quadrants is at purchasers' prices and can be valued at basic prices. As a matter of fact from the source data it will be at purchasers' prices and for converting it to basic prices we need to identify trade and transport margins and taxes (less subsidies) on products for each of the cell entries, remove and place these in the columns against the rows of trade, transport services and an additional row made for net taxes on products. Two identities hold, one the identity by industry [*Output by industry = Input by industry*] and the other the identity by product [*Total supply by product =Total use by product*].

3.   Reconciliation of Supply and Use of Products

Reconciliation of supply and use of products can be undertaken either manually, or mechanically, or a combination of both. If estimate of supply of a product coming out from Supply Table is considered firm, the estimate of the use of the product in the Use Table is to be reconciled by making adjustments in one or more categories of final uses of the product, depending upon the lack of confidence on account of the quality of the estimates. Unfortunately there is no statistical knowledge of the errors (sampling and non-sampling) in the categories of final use estimates in the present scenario of national income estimation practices. It is thus a challenge to national accounts statisticians to identify weak, weaker, weakest and robust estimates according to the data collection procedure followed and estimation methodology adopted in various producing industry sectors of the economy as well as the categories of final uses for arriving at estimates of supply and uses of products, while undertaking the reconciliation exercise. For example, aggregates like general government final consumption expenditure,

exports and imports are considered more firm than the estimates of household/ private final consumption expenditure, gross fixed capital formation and the weakest one appears to be estimate of change in inventories. The mechanical methods popularly known as the RAS or Modified RAS involve the pro-rata adjustment in the rows and columns of the product flow transactions matrix (keeping firm figures as fixed in the Modified RAS), where sum of the row totals and column totals is the same. For practical reasons in order to have only logical adjustments, it is considered advisable to apply mechanical methods (RAS or Modified RAS) only when discrepancy between supply and use is small, say, less than five per cent. Thus reconciliation exercise should begin with manual method to take account of larger discrepancies followed by mechanical method

Since the detailed data on supply and use- both intermediate and final use categories come from various sources of very different quality, most of the macroeconomic aggregates based on such data cannot be considered as firm. Thus reconciliation process requires expertise of the national accounts statistician to weigh the quality of various data and estimates before touching them up in the reconciliation exercise for each of the products.

Recently the Asian Development Bank as a research study under RETA 6483 published SUT as per 1993 SNA for 18 economies of Asia and the Pacific region but have given no clear guidelines for reconciliation of supply and use of various products and have also not seen the need to keep a note of the gaps in the unbalanced SUT for any future corrective measures in the compilation of various aggregates.

4.   Reconciliation in SUT in the context of Indian National Accounts

In the Indian national accounts statistics the final use category Private Final consumption Expenditure (PFCE) that is supposed to include final consumption expenditure of both the Households and the NPISH, is compiled following commodity flow approach. The commodity flow approach signifies that any or all errors and omissions in any of the aggregates for a household consumable product are already included in the PFCE of that product. Thus supply and use of all household consumable products in the economy should match in the exercise of compiling the SUT. Similarly in the present Indian national accounts statistics, the compilation of gross fixed capital formation by type of assets and in particular the construction broadly follow concept of commodity flow that is supposed to ensure supply and use of all capital goods as well as the basic materials that go in the construction activity as inputs to match in the exercise of compiling the SUT. The only products that need special attention in the reconciliation exercise are thus the solely intermediate consumption items of the industries.

However, despite following commodity flow approach in the estimation of PFCE, GFCF and construction output in the Indian national accounts (as also in many developing countries that follow methodology of estimation of various aggregates similar to India), acute discrepancies are faced in the reconciliation of supply and use of several products while undertaking exercises on SUT compilation or balancing exercise of Input-Output Transaction Tables. The answer to the question as to why the supply and use estimates of various products do not match despite following commodity flow approach in the estimation of PFCE, GFCF and construction output is that in the compilation of various aggregates a large number of rates and ratios are used at various stages and those may not hold true at the time of reconciliation

exercise. The rates and ratios may relate to intermediate consumption ratio of a product, input-output ratios, product-wise break-up of raw materials, chemicals, packing materials, category of others, other of others, consumables, 'rent, rates, taxes', office expenditure, partly capital goods, parts of capital and partly capital goods, trade transport margins, index of prices and volume, and so on.

It has been seen that while undertaking reconciliation exercise for the household consumable products when the work-sheets of SUT and PFCE are reviewed together the discrepancies are resolved identifying any coding mistakes, under-coverage, variation in rates and ratios used in the PFCE, margins, etc. Similarly for the products that are capital goods or are the basic materials used for the estimation of construction output, reconciliation of supply and use of the relevant products becomes smooth when the worksheets of SUT and GFCF or construction are reviewed together. For the products that are solely intermediate consumption items of the industries and do not appear in the PFCE, GFCF or Construction basic materials, reconciliation exercise requires special attention and care. For unique products like crude, mineral ores, etc. the reconciliation exercise does not pose any serious problem since the use of the product would mostly be firm and one need to check on the credibility of the supply of product. For the remaining solely intermediate consumption items reconciliation exercise is made keeping consistency of the supply and use of such products.

For implementing 2008 SNA recommendations it is pre-requisite and a must to reconcile the supply and use of products in the annual exercise of SUT compilation. Thus while compiling a balanced SUT, it should be a good practice to keep a note of the gaps confronted in the unbalanced SUT separately for intermediate and final consumable products, capital products and the basic material products that go in the construction activity, and solely intermediate consumption products. These gaps when found significant would function as watch dogs to the national accounts statisticians to take necessary corrective action in reviewing/revising the rates and ratios as well as taking necessary steps to improve the quality of various economic data that is obtained via sample and census surveys, administrative statistics and type studies, as well as in choice of alternative data sets if available, in the subsequent periods.

The SNA macro-economic framework is based on the premises that all goods and services produced in the domestic economy are put to "use" of one kind or other. *The framework establishes the equivalence of supply and use of goods and services produced and equivalence of the value of production of goods and services, income generated in production and expenditure on final products. The SNA recommends preparation of Goods and Services account in the form of Supply and Use tables to reconcile the supply or availability of each good and service in the economy and its utilization both intermediate and final use.*

Once the detailed data of supply and use of goods and services coming from various sources of official statistical system are reconciled in SUT, the measure of production (GDP) of an economy within a *period* of time, complete for all resident units without duplication is arrived at. The production account and income accounts comprising generation of income account, allocation of primary income account, secondary distribution of income account, and use of income account can then be attempted as summarized in *Annex. II.*

5.   Supply and Use Tables at Regional Level- Challenges

Somehow, at regional level preparation of SUT has not been taken-up seriously. The 2008 SNA does give clear guidelines for constructing SUT at the national level but unfortunately no specific guidelines are provided for regional SUT or regional accounts. Some Countries (Australia, U.K.) prepare regional accounts purely by allocation. In India the official guidelines on Regional Accounts are pretty old as dates back to 1976 and no official committee has been setup to update the guidelines for regional accounts despite updating of international Standard SNA from 1968 to 1993 to 2008. The National Statistical System needs to pay urgent attention to review the guidelines for Regional Accounts. It is important to note that for implementing 2008 SNA recommendations on preparing sequence of accounts it is necessary to reconcile the supply and use of products to obtain a reconciled GDP at market prices. As a corollary, thus at regional level feasible exercises on reconciling of supply and use of products should be considered important and highly desirable. Once a reconciliation procedure is made feasible, exercises on regional SUT that are technically on sound footing would become available.

A regional SUT in principle should appear exactly similar to the one for the economy elaborated above with of course, a redefined interpretation of exports/ imports from other regions (States) and other countries. Beside there would be detailed data availability problems.

Interpretation of Exports, Imports in the Regional SUT

In regional SUT exports could be to the other regions within the country or to the other countries. Similarly imports could be from the other regions within the country or from the other countries. Important point to be noted is that in an open economy for a region exports/ imports information is not readily available with the official statistical system. Thus special surveys are required to obtain such information of export/ import for a region to/from other regions in the economy as well as from other countries (Rest of the World). Since it is a difficult task it would be necessary to find other options to deal with the situation. One possible way out to deal with could be to treat net export as a residual category of final use assuming domestic output as firm.

Data availability for Regional SUT

Data availability on intermediate consumption expenditures of various industries in the Regional SUT is not a problem since all States compile their GVA estimate using information on output and intermediate consumption. What all needed is the break-up of intermediate consumption by products. This should not pose serious problem as information from public sector parts can be culled out from the analysis of respective budget documents/annual reports. For private sector part, information from Enterprise surveys can be used. For agriculture sectors use should be made of Cost of Cultivation Studies of the State. Organized mining and manufacturing sector detailed data is available from Indian Bureau of Mines and Annual Survey of Industries.

As regards data availability on final consumption expenditures, Estimates of Household final consumption expenditure (FCE) at State level can be obtained using the results of Household Consumption Expenditure Surveys conducted by the NSSO. Estimate of NPISH FCE at regional level can be worked out either applying a proportion of PFCE to HFCE at national level or assuming ratio of PFCE to Gross Domestic Product invariant at regional and economy level. Estimates of Government Final Consumption Expenditure can be obtained through the

analysis of the State government and the local bodies' budget documents of the State and taking central government expenditure allocation for the State.

Gross Capital Formation has three components namely Gross Fixed Capital Formation (GFCF), Change in Inventories (CII) and Valuables. The GFCF appear in the Use Table as column showing the acquisition *less* disposals of capital assets by the producers in the economy by type of product, CII appear as a column showing the various products that are goods and held by the producers or traders, and valuables also appear in a column by type of product. Information on net acquisition of valuables is as on date quite scanty and most States do not publish information on valuables acquired in the regional economy. Not all States are compiling estimates of GFCF. Even the States that prepare GFCF estimates are mostly doing for only public sector only.

Let us examine the issue of compiling estimates of GFCF by type of asset at the State level. The GFCF by type of asset basically includes construction and 'machinery and equipment'. Of course other items as per 2008 SNA would include expenditures on Intellectual Property Products (which include research and development, software, databases, mineral exploration/evaluation, etc.), and increase in cultivated biological resources (increment in livestock, plantation). It may be mentioned that the construction output is already estimated by the States in the course of compiling their domestic product estimation exercises. It may be mentioned that the CSO has recently attempted estimates of GFCF of all States taking public sector part from the actual analysis of budgets/ reports and private sector part by allocation of national level information. This needs to be firm-up with the interaction/ collaboration with State DESs and further examination and exploitation of MCA21 database. In short though perfectly feasible, greater effort is still needed to compile reasonable estimates of GFCF by type of assets for regions.

The estimates of CII are not readily available for States. Such estimates need to be prepared by the State DESs following the institutional approach as at national level (*c.f. NAS-Sources and Methods, 2007*) even if it is not perfect. The CSO can help encouraging the DESs also by making available such estimates prepared by type of institutions and allocated to the States appropriately. The information on Valuables category is now available at national level. This can appropriately be allocated to States and thus again requires cooperation of CSO in this regard.

6.   Gross State Domestic Product (GSDP) at factor cost and market prices

The States at present compile Gross State Domestic Product (GSDP) at factor cost prices only. As per 2008 SNA the GDP is always at market prices. Thus the GSDP estimates at factor cost compiled by the State DESs are in fact not the GDP estimates for the States but merely the Gross Value Added (GVA) estimates that get generated in the process of production activity in the States. States compile their estimates of domestic product following income originating approach since the income accruing approach that theoretically should be preferred, has lot of data problems. For obtaining the estimates of GDP of the State which should be at market prices we need to add the net indirect taxes to the GVA (which at present is termed as GSDP at factor cost prices) of the State. Compilation of estimates of net indirect taxes is difficult for the States since major component of indirect taxes are received by the center. To resolve this problem the

CSO has since developed a methodology of allocating the indirect taxes less subsidies components for each of the States. Thus the States can now have their GSDP estimates at market prices.

It may be clarified that as per 2008 SNA the estimates of GVA at basic prices are to be obtained from output that is at basic prices by subtracting the intermediate consumption at purchasers' prices. Having obtained GVA at basic prices for all industries in the State economy, the GSDP would be obtained by adding the taxes on products less subsidies on products. CSO thus now require making available the taxes on products less subsidies on products components for each of the States to enable them to have the estimates of their GSDP at market prices.

7.   Feasibility of SUT at Regional level

We have very well seen above that it is true that preparation of regional level SUT confronts serious data problems (non-availability) for obtaining the estimates of exports, imports, GFCF and CII. It is important that the States must compile at the earliest their estimates of GFCF. Since most States are already compiling their estimates of GFCF for public sector, what all needed is the estimates of GFCF for private sector which is feasible to start with by allocation method of the GFCF of private sector at the national level using appropriate indicators. Despite all the data problems relating to export, import, and CII it is interesting to note that balancing of supply and uses of services products in the State economy is feasible since services products do not attract generally any export, import and CII. Some services are exported/ imported but that component, if any would only be minor. Thus we can reconcile SUT perfectly for most services products.

For services products reconciliation exercises of supply of product outputs (from Supply Table converted to purchasers prices meaning including net taxes on products) and use of product (generated in the respective row of Use Table) therefore should be undertaken to remove inconsistencies that might occur in the estimates. Since services sectors contribute major share (about seventy per cent) in the economy, the reconciliation exercise is thus possible for major part of products in the economy. Beside information on certain specific products like crude to a refinery or a mineral ore import / export are readily available in the statistical system and thus reconciliation of supply and use of such products would be cool. Thus it is feasible to prepare reasonably well a SUT at regional level almost reconciled and thereby leading to an almost balanced GSDP estimate at the region (State) level.

8.   Concluding Remarks

In 2008 SNA there is no place for statistical discrepancies/errors and omissions in any of the accounts. All statistical discrepancies are reconciled in a balanced SUT which is must and a pre-requisite for compiling Sequence of Accounts

In the Indian national accounts since commodity flow approach is followed in the estimation of PFCE and GFCF, reconciliation of supply and use of products has been found feasible.

At State level the SUT poses challenges on account of differently defined exports/ imports and data problems for various aggregates. Almost balanced estimate of GSDP is feasible provided State level GFCF estimates for private sector are completed to start with by allocation method.

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Consolidated set of Accounts in the 1968 SNA

Account 1: GROSS DOMESTIC PRODUCT AND EXPENDITURE

1.1	Net domestic product at factor cost (3.6)	1.6	Government Final Consumption Expenditure (3.1)
1.2	Consumption of fixed capital (5.6)	1.7	Private Final Consumption Expenditure (3.2)
1.3	Indirect taxes (3.9)	1.8	Gross Fixed Capital Formation (5.1.1)
1.4	*Less* Subsidies (3.10)	1.9	Change in Stocks (5.1.2)
		1.10	Exports of goods and services (6.1)
		1.11	*Less* Imports of goods and services (6.7)
		1.12	*Discrepancies*
1.5	**Gross domestic product (1.13)**	**1.13**	**Expenditure on GDP (1.5)**

Account 3: NATIONAL DISPOSABLE INCOME AND ITS APPROPRIATION

3.1	Govt. Final Consumption Expenditure (1.6)	3.6	Net domestic product at factor cost (1.1)
3.2	Private Final Consumption Expenditure (1.7)	3.7	Compensation of employees from ROW, net (6.2-6.8)
3.3	Saving (5.5)	3.8	Property and entrepreneurial income from ROW, net (6.3-6.9)
3.4	*Statistical discrepancies*	3.9	Indirect taxes (1.3)
		3.10	*Less* Subsidies(1.4)
		3.11	Other current transfers from ROW,net (6.4-6.10)
3.5	**Appropriation of national disposable income (3.12)**	**3.12**	**Disposable income (3.5)**

Account 5: CAPITAL FINANCE

5.1	Gross Capital Formation	5.5	Domestic saving (3.3)
5.1.1	Gross Fixed Capital Formation (1.8)	5.6	Consumption of fixed capital (1.2)
5.1.2	Change in Stocks (1.9)	5.7	Capital transfers from the ROW, net (6.15)
5.1.4	Errors and Omissions		
5.2	Purchase of intangible assets from ROW, net (6.18)		
/5.3	Net lending from the ROW, net (6.20-6.16)		
5.4	**Gross accumulation (5.8)**	**5.8**	**Finance of Gross accumulation (5.4)**

Account 6: EXTERNAL TRANSACTIONS

	Current transactions		
6.1	Exports of goods and services (1.10)	6.7	Imports of goods and services (1.11)
6.2	Compensation of employees from ROW (3.7)	6.8	Compensation of employees to ROW (3.7)
6.3	Property and entrepreneurial income from ROW (3.8)	6.9	Property and entrepreneurial income to ROW (3.8)
6.4	Other current transfers from ROW (3.11)	6.10	Other current transfers to ROW(3.11)
6.5	*Adjustment of merchandise exports to the change of ownership basis*	6.11	*Adjustment of merchandise imports to the change of ownership basis*
		6.12	Surplus of the nation on current accounts
6.6	Current receipts (6.1-6.5)	6.13	Disposal of current receipts
	Capital transactions		
6.14	Surplus of the nation on current accounts	6.18	Purchase of intangible assets from ROW, net (5.2)
6.15	Capital transfers from the ROW (5.7)	6.19	Capital transfers to the ROW (5.7)
6.16	Net incurrence of foreign liabilities (5.3)	6.20	Net acquisition of foreign financial assets (5.3)
6.17	**Receipts**	**6.21**	**Disbursements**

National Accounts and Macro-economic Aggregates in 2008 SNA

Production: In SNA, measure of production is Gross Value Added (GVA) defined as GVA = GVO – IC, where GVO stands for Gross Value of Output and IC for intermediate consumption. Gross Domestic Product (GDP) is the sum of GVAs of enterprises in the economy and taxes on products less subsidies on products. GVA and GVO are at basic prices whereas intermediate consumption (IC) is at purchaser's price. Following rules of accounts of the SNA, the uses on left hand side and resources on right hand side the **Production Account** is as under

	Uses	Resources
Production Account	Intermediate Consumption	Output, *of which*:
		Market output;
		Output for own final use and
		Non-market output
		(Taxes-subsidies) on products and imports
	GVA / GDP (B1)	

Generation of Income: GVA resulting from the process of production is the income generated, which in turn is distributed to the owners of resources (human resource, natural resource, financial resource and produced resource) as primary incomes Primary incomes are in fact incomes accruing to units for their involvement in or for ownership of assets used in production processes. Households as employees receive Compensation of employees (CE) for their labour in an enterprise and remaining primary income in the enterprise is termed as gross Operating surplus (OS). Own account entrepreneurs/ Self-employed cannot distinguish CE or OS thus for them the primary income is termed mixed income (MI)-a mix of CE and OS. Government receives taxes on products (both domestic products and imports) less subsidies on products which the system considers part of income (in GDP). OS includes rent which the Government receives as owner of natural resources/assets for its usage; interest which the owners of financial resource receive for usage of their money capital (investment income); profit/loss accrues to owners of entrepreneurship. Primary income is also received from (and paid to) rest of the world (RoW). Gross OS also includes consumption of fixed capital (CFC). The **Generation of Income Account** is presented below

	Uses	Resources
Generation of income Account		*GVA / GDP (B1)*
	Compensation of employees	
	(Taxes – subsidies) on production and imports	
	Mixed income(B3) +Operating surplus (B2)	

Allocation of Primary Income: For an institutional unit Balance of Primary Income is the total value of the primary incomes receivable less total of the primary incomes payable. At the level of the total economy, the same is called gross national income (GNI). Thus, GNI = primary income generated in the domestic economy (GDP) + (net) primary income receivable from RoW. The **Primary Distribution of Income Account** showing allocation of income at total economy is presented below

	Uses	Resources
Primary Distribution of Income		*Mixed income (B3) +Operating surplus (B2)* Compensation of employees (Taxes – subsidies) on production & imports
	Property Income payable *Gross National Income (B5)*	Property Income receivable

Secondary Distribution of Income: Out of the balance of primary income (gross), the institutional units may pay and/or receive current transfers: that is transactions in which an institutional unit provides part of primary income to another unit without receiving from the latter anything in return as a direct counterpart. After making the current transfers, the institutional units are left with Gross National Disposable Income (GNDI). Thus, GNDI = GNI + Current Transfers receivable - Current Transfers payable

Secondary Distribution of Income Account presented below shows GNDI as the balancing item.

	Uses	Resources
Secondary Distribution of Income		*Gross National Income (B5)*
	Taxes on income and wealth payable	Taxes on income and wealth receivable
	Social contributions and other social benefits payable	Social contributions & other social benefits receivable
	Other current transfers payable	Other current transfers receivable
	Gross National Disposable Income (B6)	

Use of Income: The GNDI the available income is spent by the households, government and NPISHs on final consumption. Gross Saving = GNDI- Final Consumption Expenditure
The *Use of Income Account* is presented below showing Gross Saving as the balancing item.

	Uses	Resources
Use of disposable Income Account		*Gross National Disposable Income (B6)*

	Final Consumption Expenditure, *of which*:
	    Household FCE;
	    NPISHs and Government FCE	

	Adjustments for households pension funds payable	Adjustments for households pension funds receivable
	Gross Saving (B8)	

The balance gross saving, then flows to the financial market. Enterprises borrow from the financial market for their acquisition of non-financial capital assets, i.e., gross domestic capital formation. This leads to the accumulation accounts in the form of capital account and financial account. Using the expenditure and income side identities, this reduces to

Gross Saving = Gross Domestic Capital Formation (GDCF)
            + Acquisition less disposal of non-produced non-financial assets
            - (net) Capital transfer receivable + Net lending (to ROW)

Where, GDCF is the sum of gross fixed capital formation (GFCF), change in inventories (CII), and acquisition less disposal of valuables. Following rules of accounts of the SNA in accumulation accounts, the changes in assets on left hand side and changes in liabilities and net worth on the right hand side, ***Capital Account and Financial Account*** are presented below

	Changes in Assets	**Changes in Liability and Net Worth**
Capital Account	Gross Fixed Capital Formation Change in Inventories Acquisition less disposal of valuables Acquisition less disposal of non-produced non-financial assets *Minus* CFC ***Net Lending /Borrowing (B9)***	***Gross Saving (B8)*** Capital transfers receivable *minus* capital transfers payable
Financia l Account	Net acquisition of financial assets ***Net Lending /Borrowing (B9)***	***Net Lending /Borrowing (B9)*** Net incurrence of liabilities

Summarizing above in short the main identities in SNA, each providing an account are:
Commodity balance: Gross value of output of goods and services at market prices (mp)

$$GVO_{mp} \equiv IC + PFCE + GFCE + GFCF + CII$$
$$+ \text{ Acquisition less disposal of valuables} + X - M \quad \ldots \quad \ldots \quad \ldots \quad [1]$$

Where, PFCE: private final consumption expenditure (household final consumption expenditure (HFCE) and FCE of Non-Profit Institutions serving Households (NPISHs); GFCE: Government final consumption expenditure, GFCF: gross fixed capital formation, CII: change in inventories, X: exports, M: imports.

Production-side identity:
$$GDP_{mp} \equiv GVO_{bp} - IC + \text{product (t-s)} + \text{(t-s) on imports} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad [2]$$

Where product (t-s) denotes taxes on products less subsidies on products; and (t-s) on imports denotes taxes on imports less subsidies on imports.

Income-side identities:
$$GDP_{mp} \equiv (CE + OS + MI) \text{ generated in domestic enterprises}$$
$$+ \text{ Product (t-s)} + \text{(t-s) on imports} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad [3]$$
Where CE denotes compensation of employees, OS denotes operating surplus, and MI denotes mixed income, the mix of CE and OS due to self-employed/ own account enterprises.
$$GNI \equiv (CE + OS \,\&\, MI) \text{ generated in domestic enterprises}$$
$$+ \text{ Product (t-s)} + \text{(t-s) on imports}$$
$$+ \text{ CE from RoW (net)} + \text{PI from RoW (net)} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad [4]$$

$$GNDI \equiv GNI + \text{(net) current transfers}$$
$$+ \text{(Net) taxes on income and wealth from RoW} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad [5]$$

Expenditure-side identities:

$$GDP_{mp} \equiv PFCE + GFCE + GFCF + CII$$
$$+ \text{Acquisition less disposal of valuables} + X - M \quad \ldots \quad \ldots \ldots \quad \ldots \qquad [6]$$

$$\text{Gross Savings} \equiv GNDI - (PFCE + GFCE) \qquad \ldots \quad \ldots \quad \ldots \quad \ldots \qquad [7]$$

Implies,   Net lending from RoW $\equiv$

Gross Savings + (net) Capital transfer receivable
- (GDCF + acquisition less disposal of valuables)
- Acquisition less disposal of non-produced non-financial assets … …   [8]

SNA framework reflects the economic processes through sequence of accounts that provides an overview of a given economy. Sequence of Accounts is the core of accounting framework and is structured by institutional sectors (including ROW) in three sub-sets of accounts, namely: Current accounts, Accumulation accounts and Balance sheet accounts. Institutional sectors comprise Corporate Financial, Corporate Non-financial, General Government, NPISH, and Household sector and sequence of accounts are to be compiled for each of the institutional sectors.

Current accounts record production, distribution and redistribution of income as illustrated in the various equations shown above as identities. Thus Production account is identity [2]; Income accounts comprising Generation of income account   is identity [3]; Allocation of primary income account is identity [4]; Secondary distribution of income account is identity [5]; Use of income account is identity [7]. Accumulation accounts record all changes in assets and changes in liabilities in the Capital and Financial account is identity [8]. Besides, as per 2008 SNA, the Other changes in assets account includes 'Other changes in volume of assets account' and 'Revaluation account'. Balance sheets record stocks of assets and liabilities and the difference between them.

Each account has a balancing item that is significant as a macro-economic aggregate like gross / net domestic product (GDP / NDP), gross / net national income (GNI/ NNI), gross / net disposable income (GNDI/NNDI), gross / net saving; and in the capital/ financial account as net lending/borrowing.