

“Construction of Social Accounting Matrix for India”

M.R Saluja

(India Development Foundation)

12th Dec, 2013

- SAM is an organised matrix representation of all transactions and transfers between different production activities, factors of production and institutions (Households, firms and government) within the economy.
- Each row of the SAM gives receipts of an account while the column gives the expenditure.
- SAM is an extension of Input-Output (I-O) table. In I-O table final consumption expenditure, capital formation, & trade are shown by product or industry of origin and intermediate consumption both by product or industry of origin and destination. Income generation is given by value added. SAM in addition gives the inter-relationship between income distribution and final expenditure.

Continue

- Production of goods & Services requires inputs and factors of production, viz. labour and capital. Inputs are made available as intermediate products from other sectors or same sector itself.
- The factors of production are contributed by the institutions (viz. households, firms and government). Institutions receive factors' payment as value added.
- The other sources of income of institutions are transfer payment from the government and remittances from rest of the world. Income, thus earned, is spent as the consumption expenditure on goods & services, paid to the government as taxes and the rest is saved. The demand of Goods & Services and factors is harmonized by imports. The saving is used as investment.

- First attempt made by Sarkar & Subbarao(1981).
- Sarkar & Panda (1986)
- Detailed SAM for Indian economy for 1994-95 (60 sectors, two factors of production, six categories of occupational households separately for rural & urban). Updated upto1997-98 and to 2002-03.
- SAM for 2003-04 consists of 73 production sectors, two factors of production, five household classes by expenditure level separately for rural and urban .First SAM which gives the household classes by expenditure levels.
- SAM for 2007-08 consisting of 78 sectors, two factors of production and seven economic agents.

Aggregated SAM for India, 2007-08

(Values in Billion Rs)

	Agriculture	Manufacturing	Services	Labour	Capital	PFCE Rural	PFCE Urban
Agriculture	1752	5836	689	0	0	4329	1956
Manufacturing	1337	18186	4634	0	0	4146	2692
Services	935	7479	4408	0	0	5179	7231
Labour	4860	5324	11243	0	0	0	0
Capital	4345	5898	11559	0	0	0	0
Rural	0	0	0	10330	7435	0	0
Urban	0	0	0	11070	3143	0	0
Priv. Corp.	0	0	0	0	3968	0	0
Pub. Enter.	0	0	0	0	1058	0	0
Govt	0	0	0	0	891	879	1052
Ind. Tax	-446	1738	478	0	0	588	626
Capital A/C	0	0	0	0	5095	5540	3656
ROW	3051	8629	637	0	0	0	0
Total	15835	53090	33648	21400	21590	20659	17212

Aggregated SAM for India, 2007-08

(Values in Billion Rs)

	Pvt. Corp.	Public Enter.	GFCE	Indirect tax	GFCF	Exports	Total
Agriculture	0	0	80	0	221	972	15835
Manufacturing	0	0	519	0	15697	5879	53090
Services	0	0	4091	0	916	3409	33648
Labour	0	0	0	0	0	-27	21400
Capital	0	0	0	0	0	-211	21590
Rural	0	0	2525	0	0	369	20659
Urban	0	0	1732	0	0	1268	17212
Priv. Corp.	0	0	177	0	0	0	4145
Pub. Enter.	0	0	0	0	0	0	1058
Govt	1641	0	0	4052	0	-100	8414
Ind. Tax	0	0	58	0	1011	0	4052
Capital A/C	2504	1058	-767	0	0	-49	17037
ROW	0	0	0	0	-808	0	11509
Total	4145	1058	8414	4052	17037	11509	

Aggregate SAM for India (2003-04)					(Rs. Lakhs)			
	C1	C2	C3	C4	Labour	Capital	RHH	UHH
Commodities								
C1	7752747	33736795	2952488	1772065	0	0	26216709	16025755
C2	6712876	66772935	17237511	10736658	0	0	27225643	16532093
C3	3873752	30554839	10794900	5188897	0	0	25816249	25946866
C4	180852	5742449	7494329	5181026	0	0	13740837	25555630
Labour	33906785	31817767	28857329	36452239			0	0
Capital	29564122	25229525	43918046	22735596			0	0
RHH	0	0	0	0	53618727	54954683	0	0
UHH	0	0	0	0	77102794	22232225	0	0
Private corporations	0	0	0	0		9557281	0	0
Public Enterprises	0	0	0	0		4626200	0	0
Government	0	0	0	0		3618000	2198579	4152921
Indirect taxes	-1268166	8789880	3754198	1549069			3240068	2928646
Capital a/c	0	0	0	0		25363700	35296544	17818559
Rest of the world	12756258	28730550	3326565	4213424			0	0
Total	93479226	231374739	118335366	87828974	130721520	120352089	133734629	108960469

Aggregate SAM for India (2003-04) (Rs. Lakhs) (Continued)							
	Private corporations	Public Enterprises	Government	Indirect taxes	Capital a/c	Rest of the world	Total
Commodities							
C1	0	0	241399	0	1803923	2977345	93479226
C2	0	0	5156329	0	55616737	25383959	231374740
C3	0	0	2292963	0	3261191	10605708	118335365
C4	0	0	24415224	0	693607	4825022	87828976
Labour						-312600	130721520
Capital						-1095200	120352089
RHH	0	0	17326511	0	0	7834709	133734628
UHH	0	0	6978881	0	0	2646569	108960469
Private corporations					1216819		10774100
Public Enterprises							4626200
Government	6099400			24616465		-250087	40435278
Indirect taxes			685090		5094808	-157128	24616465
Capital a/c	4674700	4626200	-16661119			-3431498	67687085
Rest of the world							49026797
Total	10774100	4626200	40435278	24616465	67687085	49026800	

Aggregated SAM for India, 1997-98 (Rs in lakh)										
Activities	S1	S2	S3	S4	C1	C2	C3	C4	Labour	Capital
S1					54967396	189039	27087	159304		
S2					131295	115686034	926492	4143192		
S3					0	0	48304483	0		
S4					0	0	0	39465298		
Commodities										
C1	6647750	16218876	1590438	133656						
C2	4376847	40796070	7706339	2980678						
C3	2637585	18882208	3279207	1012564						
C4	534243	5692974	4914069	1796532						
Labour	21296481	16772825	12117083	17834451						
Capital	21416698	17378493	16734328	15424027						
Rural HH									37417762	27519872
Urban HH									30579579	20023286
Priv. Corp.										4078688
Pub. Enter.										1662400
Govt.										1319800
Ind. Taxes	-1566777	5145568	1963020	283389						
Capital A/C										15052500
ROW					3779145	11627727	947847	1464987		
Total	55342826	120887014	48304483	39465298	58877836	127502801	50205909	45232780	67997341	69656545

Activities	Rural HH	Urban HH	Priv. Corp.	Pub. Enter.	Govt.	Ind. Taxes	Capital A/C	ROW	Total
S1									55342826
S2									120887013
S3									48304483
S4									39465298
Commodities									
C1	21710038	10671630			216624		406377	1282447	58877836
C2	14737783	11377680			2890612		33040371	9596420	127502800
C3	9467709	8196190			824409		2047333	3858704	50205909
C4	8492647	9998998			12542907		0	1260410	45232780
Labour								-23500	67997341
Capital								-1297000	69656545
Rural HH					6456529			986808	72380970
Urban HH					3401159			3389592	57393616
Priv. Corp.					514012				4592700
Pub. Enter.									1662400
Govt.	2354383	2272217	2001600			13120000			21068000
Ind. Taxes	2924992	2169281			242648		2049104	-91224	13120001
Capital A/C	12693417	12707620	2591100	1662400	-6020900			-1142951	37543186
ROW									17819706
Total	72380970	57393616	4592700	1662400	21068000	13120000	37543185	17819706	

Steps

1. Construction of Absorption matrix.
2. Construction of Make matrix.
3. Division of value added – wage and non-wage income.
4. Distribution of personal income and expenditure among household categories.

Absorption Matrix

- Provides the inputs of commodities into industries ($C \times I$). It also gives different components of final demand.
- Each column represents the industries and the rows as group of commodities which are the principal products of the corresponding industries.

Make Matrix

- Row of the make matrix gives the distribution of the output of different commodities produced by the industry of that row. Column of the matrix gives the value of output of that commodity produced by different industries.

Methodology for additional blocks of SAM

➤ Division of GVA into wage and non-wage income

- Agriculture: NAS gives the breakdown of the net value added (NVA) into compensation to employees and operating surplus separately for organized and unorganized components of Agriculture and animal husbandry. The wage income of self employed has been imputed and added along with other wage income.
- Manufacturing Industries: For the organized manufacturing industries the ratio of wages and non-wages income is taken from ASI 2007-08. Wage income includes wages and other benefits from firms to employees. The ratio of wage and non-wage income for unorganized manufacturing industries has been taken from NSS 62nd round survey (year 2005-06) on unorganized manufacturing.
- Other Sectors: For the organized parts, the estimates of wage and non wage income are available from NAS. For unorganized parts, the wage components are directly estimated by making use of the follow up surveys of the economic census conducted by the NSS.

➤ Distribution of Sector-wise consumption expenditure by occupational categories of households.

- The population is divided into five rural and four urban classes. For 2004-05, detailed item wise expenditure by occupational categories is given by the NSS. The households categories based on occupation have been defined according to their principal source of income. The total sector wise PFCE is divided into occupational categories by applying the relative sector wise expenditure of each class.

Rural		Urban	
RH1	Non-agricultural Self Employed	UH1	Self Employed
RH2	Agricultural Labour	UH2	Salaried Class
RH3	Non-agricultural Labour	UH3	Casual labour
RH4	Agricultural Self Employed	UH4	Other Households
RH5	Other Households		

➤ Distribution of Household Income by Occupation Categories

- NCAER survey on income and expenditure 2004-05 gives the estimates of average per household income as well as expenditure by occupations. Using the ratio's of personal income to consumption expenditure on the estimates of total personal expenditure, the personal income estimates are obtained for different occupational categories of rural as well as urban areas.

➤ Distribution of Household Income by Source of Income

- The total income of the households consists of labour and non labour income. Non-labour income consists of capital income, interest on public debt , government transfers and current transfers from rest of the world.
- After deducting government transfers and current transfers from rest of the world, ratios from SAM 2002-03 has been taken to divide the residual between labour and capital income.
- Households income from government transfers and current transfers from rest of the world , as obtained from NAS 2009, has been distributed among different households depending upon ratios from SAM 2002-03 for occupational categories and from SAM 2003-04 for expenditure classes.

➤ Direct taxes

- Land revenue to agricultural self-employed households
- Other direct taxes distributed among occupational classes in proportional to their personal income, assuming no tax to be paid by labour class.

➤ Capital account

- This account represents the macro balancing of savings and investments. Savings include those by households, private corporate sector, public non departmental enterprises, Government and rest of the world. Net savings along with depreciation equals gross domestic capital formation.
- In the case of households, the saving of different classes are derived by subtracting their consumption and direct taxes from their total personal incomes.
- Retained earnings of the private corporate sector and non-departmental public enterprises are treated as their savings. For the government, the difference between revenue and current expenditure is its savings. Foreign savings meet the difference between gross domestic capital formation and gross domestic savings.

Applications of SAM

- Through SAM, the impact of changes in the various policy instruments can be estimated. The instruments can be social programmes, as MGNREGA, Indra Awaz Yojana etc floated by government along with growth.
- One can estimate the effect on the employment, income generation and distribution and revenue earned by the government, etc. by using output, income and employment multipliers.
- The impact can be on different producing sectors of the economy and different sections of the households. The poverty alleviation effects of policy instruments can be estimated.
- SAM can also be used as a base for the CGE models.

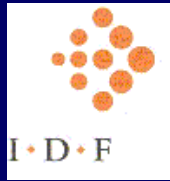
- SAM provides a framework and consistence data for the economy wide models with detailed classification of sectors such as industries, categories of employed persons and institutional sub sectors, including various socio economic household groups. Sam can be used as database of CGE or other economic models.

➤ Specific applications

- The all India SAM constructed by IDF for 2003-04 , is used by planning commission for estimating the effects of policy changes such as trade liberalization , tax rates and structural adjustment programmes on growth and income distribution. The SAM was also used for getting policy perspectives in the energy sector by making use of an energy model.
- SAM for 2003-04 was used by IDF to evaluate a) effect of increase in services exports on the different sectors of the economy and different sections of households, b) the impact of slowdown on economy and households.

- The regional SAM for 2003-04 were constructed by dividing Indian states into four regions based on state incomes. A CGE model was then constructed that helped the finance commission in allocating funds for different categories of states.
- SAM constructed for village in Gujarat to analyses the effect of the MNREGA on the local economy.
- Using SAM for 2002-03 a 28 sector CGE model used to evaluate the impact of the HIV epidemic on the different sectors of the Indian economy. This was under the UNDP programme and commissioned by NACO.

- SAM for 2007-08 was used as part of 11th five year plan and beyond. A project undertaken by IEG and supported by planning commission.
- SAM can provide an analysis of the interrelationship between the production structure of an economy and the distribution of income and expenditure of different household groups.



THANK YOU
msaluja@idfresearch.org