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No. 171

Social Accounting Matrix of Pakistan for 1989-90

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Pakistan
Institute of
Development
Economics

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1. INTRODUCTION

Since last three decades, the social accounting matrix (SAM) has been extensively used as a tool for policy analysis.[1] Recently, the SAM framework is commonly used in computable general equilibrium (CGE) models for analysing structural adjustment reforms and their impact on income distribution and poverty in developing countries (for example, Robinson (1988) and Taylor (1990) provide a comprehensive survey on SAM-based CGE modelling). The classification and disaggregation of accounts in a social accounting matrix can take various forms, depending on how the constituent accounts are defined and depending on one's analytical interests and specific policy concerns. There are two main objectives of the report. First, it develops a latest social accounting matrix for the year 1989-90 with possible disaggregation of the households sector based on income levels. It is worth to note that earlier social accounting matrix for the year 1984-85 developed by the Federal Bureau of Statistics did not provide a disaggregation of the households sector. This limits the analysis of the households sector, particularly when distributional and redistributional aspects need to be given importance. Therefore, this paper fills this gap. The SAM developed here will later assist in operationalising the CGE model to be developed for Pakistan in order to analyse the Micro Impact of Macroeconomic Adjustment Policies (MIMAP) on income distribution and poverty in Pakistan under MIMAP-Pakistan Project. Second, this report intends to calculate the impact multipliers of socio-economic linkages using the static fixed-price SAM-based framework.

The compilation of a comprehensive input-output (I-O) table started in Pakistan in 1975-76 by the Pakistan Institute of Development Economics (PIDE) and the first detailed 1-O table was produced in 1983 and the first social accounting matrix for the year 1979 was published in 1985 by the Pakistan Institute of Development Economics. While the Federal Bureau of Statistics (FBS) started compilation of the social accounting matrix for 1984-85 and the second consolidated SAM for the year 1984-85 was produced by the FBS in 1993 with the collaboration of the Dutch Government under Improvement of National Accounting System (INAS) project. The macroeconomic variables in the accounting matrix for 1984-85 were derived from the estimates of the Institutional Sector Accounts for 1984-85 and from the 1-O table 1984-85 for

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[1]For example, Pyatt and Round (1977, 1979, 1985), Pyatt (1985, 1988, 1991a, 1991b), King (1985), Thorbecke (1985), James and Khan (1993), and Iqbal (1996) all provide excellent introduction to SAMs and their uses.

Pakistan. The FBS continued its endeavours and produced the second 1-O table for the year 1989-90 in 1996. The information presented in 1-O table 1989-90 includes supply and use tables and the industry by industry flow table. The 1-O table provides an elaboration of the production account of the system of national accounts in Pakistan for the year 1989-90. The Integrated Economic Accounts (IEA) for the same year 1989-90 have also been compiled in conjunction with the 1-O table for 1989-90.[2] The IEA was developed using different data sources, for example, National Accounts Statistics; Balance of Payment Statistics; Household Income and Expenditure Survey; and Public Finance Statistics. The Integrated Economic Accounts provide a comprehensive overview of inter-relationships between economic agents involved in income generation, distribution, accumulation and finance in the economy. The full details of the methodology and data sources used in the preparation are described in the main documents of 1-O table and IEA for 1989-90.[3]

Since the FBS did not produce the social accounting matrix for the year 1989-90, using input-output table and integrated economic accounts for the year 1989-90, we attempt to compile a latest social accounting matrix for the same year 1989-90 with disaggregation of the households sector. In the present SAM, the input-output industry classifications have been condensed into five main production accounts namely agriculture, industry, health, education and other sectors. The SAM 1989-90 also includes two factors of production (labour and capital), four economic institutions (households, firms, government, and rest of the world) and one aggregate capital accumulation account. The households account is further disaggregated by four income categories of rural and urban households in Pakistan. These accounts relate to the circular flow of production, consumption, and accumulation. It also provides details about the key macroeconomic variables and institutional relationships of Pakistan's economy for the year 1989-90 in the framework of the integrated system of national accounts. In this format, it yields a 28 x 28 social accounting matrix of Pakistan.[4]

The report is divided into six sections. Following the introduction, section II describes the schematic presentation of a SAM. Section III shows the compilation of aggregate SAM of Pakistan for the year 1989-90 and describes the production, income, expenditure, and accumulation accounts. Disaggregation

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institutional Sector Accounts for 1984-85 and Integrated Economic Accounts for 1989-90 have almost similar characteristics.

[3]For IEA, see Rizvi (1996) Integrated Economic Accounts for 1989-90, Federal Bureau of Statistics, Statistics Division, Government of Pakistan and for 1-O table see Federal Bureau of Statistics (1996), Supply and Use Tables of Pakistan 1989-90, Statistics Division, Government of Pakistan.

[4]Since the compilation of a SAM is quite flexible, it has been condensed according to our own choice and specific policy objectives, which will be analysed in detail in the later analysis.

of the households sector is described in section IV. The multipliers are calculated and explained in Section V. The final section gives concluding remarks and also indicates the extension of work for the modelling component of MIMAP - Pakistan.

2. THE STRUCTURE OF A SOCIAL ACCOUNTING MATRIX

A Social Accounting Matrix (SAM) for the year 1989-90 in Table 1 presents a summarized but comprehensive picture of the whole economy by showing the interrelationship among different aspects of economic transactions in production, consumption, and investment. According to standard accounting principles of a SAM, incoming (income) in one account is balanced by an outgoing (expenditure) of another account. Since incoming and outgoing are recorded in a single entry system, the social accounting matrix is a square matrix by definition. For every row there is a corresponding column and sum along the row is equal to the sum along the corresponding column. A theoretical structure of a social accounting matrix (with the aggregate households sector) for the year 1989-90 is reported in Table 1. It is 21 x 21 matrix which includes 20 rows and columns for real sectors and one row and its respective column for aggregate capital account. This SAM presents four types of accounts: factors account, institutions account. production account, and capital account. These accounts are disaggregated on the basis of requirements and availability of data. Factors of production account is disaggregated into labour (L) and capital (K) accounts. Institutions accounts consist of aggregate households (HH), firms (F), government (G), and rest of the world (R). These accounts elaborate the inter-institutional linkages. Production account is disaggregated into agriculture (A), industry (I), education (E), health (H) and other sectors (O). Further disaggregation of production account of ith goods is also made on the basis of goods for domestic market and for export market. Finally, it presents consolidated capital account. A brief discussion on each account reported in Table 1 is given in the following sub sections.

2.1. Factors Account

This account is related to two factors of production namely labour and capital. It distinguishes between the wages to labour and capital income (operating surplus) engaged in the production activities in i sectors of the economy. Ten cells at the cross of first two rows and 7 to 11 columns indicated in Table 1 together constitute value added module. Where W_A, W_I, W_E, W_H, and W_O in these cells present wages to labour from agriculture, industry, education, health, and other sectors, respectively. Similarly, RK_A, RK_I, RK_E, RK_h, and RK_O present, respectively, capital income from agriculture, industry, education, health, and others sectors. This income is distributed among 1 agents. **All** wage income (W) is received by households as remuneration for their

Table 1

Structure of Aggregate Social Accounting Matrix of Pakistan, 1989-90

		Factors of Production		Agents			Total Production						Goods for Domestic Market					Goods for Exports Market				Aecumu Lation	
		Labour	Capital	Households	Firms	Government	Rest of World	Agriculture	Industry	Education	Health	Other Sectors	Agriculture	Industry	Education	Health	Other Sectors	Agriculture	Industry	Health	Other Sectors	Accumulation	Total
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Labour	(1)							WA	W,	WK	W„	W,,											W
Capital	(2)							RKA	RK,	RKK	RK	RIG,											RK
Households	(3)	W	RK		DIV,,,	TOIIII.	T_{Kltrl}																Y„
Firms	(4)		RKK			T_{tIF}																	YF
Government	(5)		RIG,	ID,,	IDK		TRG	IIA	II,	III	III,	»,	TMA	TM,	TM,	TM„	TM,						Y,;
Rest of World	(6)				TKR								MA	M,	M,,	M„	M,						RR
Agriculture	(7)					SUBA							VDA					ETA					VXAS
Industry	(8)					SUB,								VD,					ET,				VX,S
Education	(9)					SUBh									VDK								VX,S
Health	(10)					SUB„										VD„				ET„			VX„S
Other Sectors	(11)					SUBo											VDr,				ET«		VX0S
Agriculture	(12)			D„HA		DGA		IC_{AA}	ICA,	1CAK	ICA	ICAo										IVA	VXA°
Industry	(13)			D„II,		DG,		$1C_{,A}$	IC„	IC„,	IC,	ICR,										IV,	VX,”
Education	(14)			Dun,,-		DGK		1CKA	ICH	1C„:	ICKH	ICHO										IVE	VXK[1]
Health	(15)			DJUJH*		DG„		$1C_{A}$	IC„,	IC_{K}	IC„,	ICJK,										IV„	VX„[,]
Other Sectors	(16)			DJHIO		DG„,		IOM	IG„,	ICoK	IC„„	ICoO										IV,,	$VX_{(,)}$”
Agriculture	(17)						ETA																ETA
Industry	(18)						ET,																ET,
Health	(19)						ET„																ET„
Other Sectors	(20)						ET_{O}																ET_{O}
Accumulation	(21)			S,,,,	SK	Sc:	CAB	DA	D,	D_{k}	D„	Do											ST
Total	(22)	W	RK	Y„	YF	Y,:;	RR	VXAS	$VX,^{S}$	VX_{k},*	VX„*	VX0S	VXA”	VX,[n]	VXE°	VX„*	VXp[*]	ETA	ET,	ET„	ET,,	IT	

* Third H| is for heath.

Table 2

Notation and Definition

Notation	Definition
i = (A,I,E,H,O)	Branches of production (A=agriculture, I=industry, E=education, H=health, O = other sectors)
1 = (HH,F,G,R,)	Agents (HH=households, F=firms, G=government, and R= rest of the world)
n	Households income groups (1,2,3,4)
CAB	Current account balance (foreign savings)
D1V,,,,	Dividends paid to households
Dmij	Households consumption of good i
DG,	Government consumption of good I
D,	Depreciation
ET,	Exports of good i
HR	Rural households
HU	Urban households
HU1/HR1, HU2/HR2, HU3/HR3, HU4/HR4	Households groups (HU1/HR1= urban/rural households having income level upto Rs.2500, HU2/HR2= urban/rural households having income level Rs.2501-4000, HU3/HR3= urban/rural households having income level Rs.4001-7000, and HU4/HR4= urban/rural households having income level Rs.7001&above.
1D1	Income tax paid by agent I
II,	Indirect taxes on good i
IC_{ij}	Intermediate consumption produced by branch I and consumed by branch j
IT	Total gross investment
IV,	Consumption of good i for investment uses
M,	Imports of good i
RK,	Capital income from i branches of production
RK1	Capital income of agent I
RK	Total Capital Income
RR	Total payments to or receipts from the rest of the world
S,	Agent I's savings
SUB,	Subsidies on production i
ST	Total gross savings
Toim	Government transfers to households
f,,,	Government transfers payments to firms
TRHH	Foreign transfers to households (in local currency)
TR	Foreign transfers to government (in local currency)
T_{WR}	Firms transfers to the rest of the world
TM,	Import duties on good i
VD,	Local production of good I sold in domestic market
VX_i^S	Total supply of good I
VX_i''	Total demand of good I
W,	Wages paid by branch I
W	Total wage payments

services of supplied labour. On the other hand, capital income is distributed among all agents namely households (RKHH), firms (RKF), and the government (RKo). Algebraically, equations for labour income and capital income can be written down. Left side of each equation represents income of an account and right side shows expenditure of that account.

Labour Account

$$WA + W, + WE + WH + W_O = W \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Capital Account

$$RKA + RK, + RKE + RK + RK_O = RKHH + RKF + RKg. = RK \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Gross domestic product at factor cost (GDP$_{\wedge}$1

$$W + RK = GDPFC \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Gross domestic product at market price (GDPmd

$$W + RK + 27, + ITMi + 2D, = GDPMP \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

2.2. Agents Account

This account comprises aggregate households, firms, government, and rest of the world. Rows 3-6 present income of these agents and 3-6 columns present expenditure of the respective accounts in Table 1. Accounts of these agents are described in the following paragraphs.

2.2.1. Aggregate Households Account

The households receipts (Y$_{\wedge}$) are presented in the third row of the SAM 1989-90, which include labour income (W) and capital income (RKHH) from five production activities (agriculture, industry, education, health, and other sectors). In addition to these incomes, households also receive income from other institutions such as dividends from firms (DIV$_{,,,}$), transfers from the government (TGHH), and transfers from the rest of world (TRHH). In accounting principle, income df households must be equal to households expenditure. Therefore, direct taxes paid to the government (IDHH), households consumption of goods of agriculture, industry, education, health and other sectors (DHHA, DHH$_{I}$, DHHE, DH$_{HH}$, DHHO), comprise households total expenditure where SHH is saving of households. The mathematical expression for income and expenditure of the households can be written as follows:

Income: $W + RKHH + DIV + TGHH + TmH = YHH \quad \ldots \quad \ldots \quad \ldots \quad (5)$

Expenditure: $IDm + EDHHi + SHH = YHH$ ... ... **(6)**

2.2.2. Firms Account

Firms' income (YF) includes capital income (RKF) and transfers from the government (TGF). This income has to be balanced with firms' payment to households in terms of dividends (DIVHH), direct taxes paid to the government (IDf), transfers to the rest of the world (TFR) and their saving (SF). Income and expenditure of firms can be mathematically written as:

Income: $RKF + TCF = YF$ ... ... — (7)

Expenditure: $DIVm + IDF + TFR + SF = YF$ ... ... **(8)**

2.2.3. The Government Account

This account describes the balance between government receipts and expenditure. Government receipts (Y_O) include capital income from production process ($RK_{\wedge}$), direct taxes paid by households ($ID_{\wedge}$) and by firms (IDF), transfers from the rest of the world (TRG), indirect taxes from agriculture, industry, education, health and other sectors (£11,), and import duties from agriculture, industry, education, health and other imports (ZTM,). Corresponding column shows the composition of government expenditure in the form of transfers to households (TGHH), transfers to firms (TGF), production subsidies to agriculture, industry, education, health and other sectors (ESUB,), final consumption of agriculture, industry, education, health and other sectors (EDG,) and its saving/deficit (SG). Equations for this account are as follows:

Income: $RKC + IDHH + IDF + TRG + 27/, + 2TA/, = Yc$ ... ... (9)

Expenditure: $TGHH + T_{OF} + ISUBj + HDG, + SG. = Ya$ ... ... **(10)**

2.2.4. Rest of the World Account

This institution account shows demand for our exports to and supply of imports from the rest of the world. Along the 6th row of Table 1 are transfers by firms (Tfr) to the rest of the world and demand for imports of agriculture, industry, education, health and others (EM,), which together constitutes income of the rest of world. Along the corresponding column are expenditure of rest of the world which includes net transfers to households (TRHH), transfers to the government (TRG) from the rest of the world and demand for our exports for agriculture, industry, education, health and other sector (SET,). Income and expenditure of die rest of the world are balanced by adding foreign savings (CAB) along the column in the capital accounts, that is current account balance of the balance of payments. The equations for this account are as follows:

Income: $TFR + EMt = RR$ ... ... (11)

Expenditure: $TRHH + TRG + EETi + CAB = R_{n}$ ... ... (12)

23. Production Account

The classification of the production account includes agriculture, industry, education, health and other sectors. (These accounts are condensed by aggregation of 86 sub-sectors in Input-Output Table for 1989-90 prepared by the FBS (1996). Agriculture sector includes major and minor crops plus fisheries. Industry, includes large scale manufacturing, small scale manufacturing and mining and quarrying. Besides education and health, rest is included in other sectors.) The rows 7 to 11 show the revenue received which includes production subsidies (ZSUBj), sale of goods of agriculture (VDA), industry (VD_i), education (VDE), health (VDH), and other sectors (VD_o) to domestic market and to export market (ETa, ET_n, ETe, ETh, ETg), which are balanced by the cost of production of these commodities mentioned in the corresponding columns 7 to 11 by value added paid to the factors of production (W+RK), indirect taxes paid to the government (Zllj), intermediate sectoral inputs transfers (ZlCy), and consumption of fixed capital (depreciation) in these sectors (ZDj). We can write down these identities as follows:

Supply: $ESUBt + EVD_i + EETi = EVXf$ ... ... – (13)

Demand: $EWi + ERK_i + EIl_i + 27C_9 + ED_i = EVXf$ ... ... (14)

The production account is further disaggregated on the basis of goods demanded on domestic market and goods for export market. These two accounts are discussed in the following sub-sections.

23.1. Goods for Domestic Market

Along the rows 12 to 16, this account shows domestic supply of ith goods while along the corresponding columns is total demand of ith goods. The rows include households consumption of ith good (ZDHHi), government consumption of ith goods (ZDGj) intermediate demand by agriculture, industry, education, health and other sectors (ZlCy) and consumption of goods i for investment uses (ZlVj). This should be equal to aggregate demand for domestic output (ZVD_i), imports of goods (ZMj), and imports duties (ZTM_i). The mathematical expressions are:

Supply: $EDHHI + EDGi + EIC_0 + EIVi = EVX?$ ... ... (15)

Demand: $ETMi + EM_n + EVD_i = EVXf$ ... ... (16)

2.3.2. Goods for Export Market

Along the rows 17-20, this account shows supply of our exports of agriculture (ETA), industry (ET,), health (ETH) and other exports (ET_O) to the rest of the world.[5] Respective columns shows demand of our exports (ETA, ET„ ETH, ET_O) by the rest of the world. The equations are as follows:

Supply: $ETA + ET, + ETH + ET_O = LET,$ ... ... (17)

Demand: $ETA + ET, + ETH + ET_O = IET,$ ... ... (18)

2.4. Consolidated Capital Account

This account is very important as it determines its link with the real sectors of Pakistan's economy. The aggregate capital account shows that total investment (IT) is financed by total gross savings (ST). Gross saving is calculated by adding consumption of fixed capital in producing i goods (Sty) to the sum of households saving (SHH), firms saving (SF), government saving (SG), and foreign saving (CAB). Along the column 21, it shows gross investment in agriculture (IVA), industry (IV,), education (IVE), health (IVH) and other sectors (IV_O). According to principle of national accounts, gross savings must be equal to gross investment. Following equations show mathematical expression for consolidated capital account.

Gross Savings: $SHH + SF + SG + CAB + ID, = ST$ ... ... (19)

Gross Investment: $IVA + IV, + IVE + IVH + IV_O = IT$ ... ... **(20)**

3. THE AGGREGATE SOCIAL ACCOUNTING MATRIX FOR 1989-90

The aggregate social accounting matrix of Pakistan for the year 1989-90 is presented in Table 3. The Table is, in essence, the matrix presentation of the standard production, income and outlay, and capital and finance accounts combined with the input-output table 1989-90. The present matrix focuses on inter-sectoral linkages. Its presentation allows each transaction in the accounts to be represented by a single cell in the matrix. It is compiled using simple accounting principle; each flow implies an income for the row account and an outlay for the corresponding column account. Table 3 provides a complete picture of the circular flow of Pakistan's economy for the year 1989-90. It recognises factors account, institutions account, production account and aggregate capital account. Further, the production account is distinguished into goods for domestic market and goods for export market. In the following sub-sections, we describe the main accounts of the aggregated SAM reported in Table 3.

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[5] There is no export of education in the 1-O Table 1989-90.

Table 3

Aggregate Social Accounting Matrix of Pakistan, 1989-90

		Factors of Production		Agents				Total Production					Goods for Domestic Market					Goods for Exports Market				Accumulation	
		Labour	Capital	House-holds	Firms	Government	Rest of World	Agri-culture	Industry	Education	Health	Other Sectors	Agri-culture	Industry	Education	Health	Other Sectors	Agri-culture	Industry	Health	Other Sectors	Accumu-lation	Total
		0)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(IS)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Labour	(1)							45681	45415	13883	2839	101471										209289
Capital	(2)							157847	83837	2613	2815	210285										457397
Households	(3)	209289	371058		48559	9225	47410															685541
Firms	(4)		86339			45308																131647
Government	(5)			3409	24588		11544	1557	44845	2	4	13799	857	42844	0	0	3					143452
Rest of World	(6)				20713								12378	166554	0	122	18153					217920
Agriculture	(7)					0							353501					3867				357368
Industry	(8)					4742								568520					102210			675472
Education	(9)					2									19044							19046
Health	(10)					0										8914				9		8923
Other Sectors	(11)					3534											608584				22386	634504
Agriculture	(12)			203898		0		49893	103486	175	0	7826									1458	366736
Industry	(13)			264161		0		37381	227552	505	2110	149984									96225	777918
Education	(14)			4673		14137		0	82	33	0	112									7	19044
Health	(15)			4549		4231		12	31	0	176	23									14	9036
Other Sectors	(16)			151006		102438		55832	149439	999	670	101008									65348	626740
Agriculture	(17)						3867															3867
Industry	(18)						102210															102210
Health	(19)						9															9
Other Sectors	(20)						22386															22386
Accumulation	(21)			53845	37787	-40165	30494	9165	20785	836	309	49996										163052
Tout	(22)	209289	457397	685541	131647	143452	217920	357368	675472	19046	8923	634504	366736	777918	19044	9036	626740	3867	102210	9	22386	163052	

3.1. The Income and Expenditure Account

Estimates of Gross Domestic Product

Table 4 shows the broad contours of production structure of Pakistan's economy. It reports breakdown of estimates of GDP under standard expenditure and income approaches, which are derived from the social accounting matrix for 1989-90 reported in Table 3. The notable feature of SAM 1989-90 is that there are no discrepancies between the three measures of GDP. Table 4 shows that GDP in the year 1989-90 was Rs.843.4 billion, which are close (with marginal difference) to the estimate of GDP given in Pakistan National Accounts (PNA) Rs.855.9 billion in the same year 1989-90. Under the expenditure approach, final household consumption contributes in GDP by 74.5 percent, final government consumption 14.3 percent, total gross fixed capital formation 19.3 percent, aggregate exports of goods and non-factor services 15.2 percent and aggregate imports of goods and non-facto services 23.3 percent in the year 1989-90. Similarly, under income approach, the share of wage payments to labour in

Table 4

Expenditure and Income Approaches of GDP*

	(Rs. million)	(% ofGDP)
Expenditure Approach of GDP		
Final households consumption *(ED,m)*	628287	74.5
Final government consumption (XDGJ	120806	14.3
Total gross fixed capital formation (X/K,)	163052	19.3
Exports of goods and non-factor services *(SET)*	128472	15.2
Imports of goods and non-factor services *(EM)*	(197207)	(23.3)
Gross Domestic Product	843410	100.0
Income Approach of GDP		
Wage payments *(XW)*	209289	24.8
Capital income *(ERK)*	457397	54.2
Gross domestic indirect tax (X7/,)	60207	7.1
Import duties *(ETM)*	43704	5.2
Consumption of fixed capital *(ED)*	81091	9.6
Production Subsidies *(ESUB)*	(8278)	(0.9)
Gross Domestic Product	843410	100.0
Sectoral Value Added		
Agriculture *(WA + RKA + IIA + TMA + D, - SUB)*	215107	25.5
Industry *(W, + RK, + //, + TM, + D, - SUB,)*	232984	27.6
Education *(W, + RK, + IIE + TMf: + D, - SUB,)*	17332	2.1
Health *(W,, + RK,, + II$_H$ + TM,, + D,, - SUB,)*	5967	0.7
Other sectors *(W$_O$ + RKa + II$_O$ + TM$_O$ + D$_O$ - SUB,)*	372020	44.1
Gross Domestic Product	843410	100.0

* Figures in parentheses are with minus sign.

GDP was 24.8 percent, capital income 54.2 percent, gross indirect tax 7.1 percent, import duties 5.2 percent, and consumption of fixed capital (normally known as depreciation) 9.6 percent in the year 1989-90. Government also provides 1% of GDP as production subsidies to various sectors of the economy. Regarding the sectoral shares in GDP, Table 4 shows that the agriculture sector contributes 25.5 percent, industry 27.6 percent, education 2.1 percent, health 0.7 percent and other sectors 44.1 percent in the year 1989-90.

3.2. Factors of Production Account

Table 5 delineates the sectoral shares in aggregate wage payments to labour and capital income. It reveals that the share of wages from agriculture sector in aggregate wage payments was 21.8 percent, industry 21.7 percent, education 6.6 percent, health 1.4 percent and other sectors 48.5 percent in the year 1989-90. Similarly, the agriculture sector contributes in aggregate capital income by 34.5 percent, industry 18.3 percent, education 0.6 percent, health 0.6 percent and other sectors 46.0 percent.

Table 5

Sectoral Shares in Wages of Employees and Capital Income

Sectors	Wages of Employees (W)	% shares in total wages of employees	Capital income **(RK)**	Sectoral % shares in total capital income
Agriculture (A)	45681	21.8	157847	34.5
Industry (I)	45415	21.7	83837	18.3
Education (E)	13883	**6.6**	2613	0.6
Health (H)	2839	1.4	2815	0.6
Other sectors (O)	101471	48.5	210285	46.0
Total	**209289**	100.0	**457397**	100.0

3.3. Sources and Uses of Income of Agents

Sources of Income of Agents

Table 6 shows the sources of income of various institutions during the year 1989-90. These estimates are derived from Table 3 of aggregate social accounting matrix for 1989-90. Starting from households, Table 6 indicates that all wages are allocated to households, which are 30.5 percent of total households income. In addition, households receive 54.1 percent rent of their total income as capital income, which is the predominant share, while the remaining shares of households income are 7.1 percent as dividends from firms, 1.4 percent as transfers from the government, and 6.9 percent of total income as

net factor income from the rest of the world. Firms receive 65.6 percentage share of their total income as capital income and the remaining 34.4 percent are received as transfers from the government. Table 6 also shows that of the total

Table 6

Sources of Incomes of Agents

	(Rs. million)	% share in total income
Sources of Income		
Households		
Wages of labour (If)	209289	30.5
Capital income *(RKmi)*	371058	5,4.1
Dividends from Firms *(DIV)*	48559	7.1
I ransfers from government *(Tnnu)*	9225	1.4
Net factor income from the rest of the world ($T_{S:}$)	47410	6.9
Total income ($Y_{}$)	685541	100
Firms		
Capital income (/?£,)	86339	65.6
Transfers from the government *($T_{,,}$)*	45308	34.4
Total income *(Yh)*	131647	100
Government		
Direct tax from households *(IDWI)*	3409	2.4
Corporate tax from firms *($ID_{}$)*	24588	17.1
Transfers from the rest of the world *(TnrJ*	11544	8.0
Gross indirect tax (2.7/,)	60207	42.0
Import duties (274/,1	43704	30.5
Total income *($Y_{}J$*	143452	100
Rest of the World		
Interest payments by firms *(7,.«/*	20713	9.5
Imports of goods and non-factor services *($EM_{}$)*	197207	90.5
Total income *($R_{}$)*	217920	100

income, the government receives 2.4 percent as direct tax from households, 17.1 percent as corporate tax from firms, 8.0 percent as transfers from the rest of the world, 42.0 percent as indirect tax and 30.5 percent as import duties. Finally, the rest of the world receives 9.5 percent of its total income as interest payments from the firms and the remaining 90.5 percent are received from imports of goods and non-factor services by Pakistan in the year 1989-90.

Uses of Income by Agents

The respective columns of each row in the aggregate social accounting matrix reported in Table 3 give uses of income by the various institution, which are summarised in Table 7. It shows that of the total uses of income, the households spend 0.5 percent as direct tax paid to government, 91.6 percent as final consumption, and the remaining 7.9 percent are households saving. Of the total uses of income, firms pay 36.9 percent as dividends to households, 18.7 percent as corporate tax to the government, 15.7 percent as transfers to the rest of the world and the remaining 28.7 percent are treated as their saving. The government uses its total income as 6.4 percent on transfers to households, 31.6 percent on transfers to firms, 5.8 percent on production subsidies to production

Table 7

Uses of Incomes of Institutions

	(Rs. million)	% share in total income
Uses of Income		
Households		
Direct tax paid to government (IDHi)	3409	0.5
Final consumption (DHHi)	628287	91.6
Saving (SHH)	53845	7.9
Total expenditure (YHH)	685541	100
Firms		
Dividends to household (DIV)	48559	36.9
Corporate tax paid to government (IDF)	24588	18.7
Transfers to the rest of the world (TFR)	20713	15.7
Saving (SF)	37787	28.7
Total expenditure (YF)	131647	100
Government		
Transfers to households (TGHH)	9225	6.4
Transfers to firms (TGF)	45308	31.6
Production subsidies (SUB;)	8278	5.8
Final consumption (DG;)	120806	84.2
Saving (SG)	-40165	-28.0
Total expenditure (Yc)	143452	100
Rest of the World		
Net factor transfers to households (TBHH))	47410	21.8
Transfers to the government (TRG)	11544	5.3
Exports of goods and non-factor services (ET;)	128472	58.9
Saving (CAB)	30494	14.0
Total expenditure (RR)	217920	100

sectors, 84.2 percent on final consumption, while the government possesses negative savings (current deficit) of 28.0 percent of its income during the year 1989-90. Table 7 also shows that the rest of the world spends its income as 21.8 percent on net factor transfers to households, 5.3 percent on transfers to the government, 58.9 percent on exports of goods and non-factor services and the balancing 14.0 percent are foreign savings.

3.4. Goods for Domestic Market and Export Market

Table 8 shows separate estimates of goods for domestic market and goods for exports market. It shows that a lion's share of agricultural production 98.9 percent is consumed domestically, while the remaining 1.1 percent is exported to the rest of the world. Similarly, of the total industrial production, 84.8 percent is used for domestic consumption and 15.2 percent is exported. Regarding the production of other sectors of the economy, 96.5 percent is consumed domestically and 3.5 percent is exported to the external market. Table 8 also shows that agriculture contributes in total exports by 3 percent, industry 79.6 percent and other exports 17.4 percent.

Table 8

Goods for Domestic Market and Export Market for the Year 1989-90

Sectors	Tout production ($VX,^{S}$)	Domestic demand of tout production ($VX,^{O}$)	Domestic demand as % of total production	Exports of goods (ET,)	Exports as % of total production	Sectoral shares in total exports (%)
Agriculture (A)	357368	353501	98.9	3867	1.1	3.0
Industry (I)	670730	568520	84.8	102210	15.2	79.6
Education (E)	19044	19044	100.0	0	0	0.0
Health (H)	8923	8914	99.9	9	0.1	0.01
Other sectors (O)	630970	608584	96.5	22386	3.5	17.4

3.5. The Capital Account

The aggregate capital account presents the consolidated balance between total savings and total investment in Pakistan for the year 1989-90. The accounts show that how total investment is financed through the savings of various economic agents namely households, firms, government, and rest of the world. Table 9 shows the estimates of savings of various economic agents and sources of financing of overall investment in Pakistan for the year 1989-90. It shows that total investment is financed by 33 percent of household saving, 23.1 percent of firms savings, and 18.7 percent of foreign savings. In addition to savings of economic agents, consumption of fixed capital (depreciation) accounts for 49.7 percent of total investment. It is also noted from Table 9 that in the year 1989-90, the government had negative saving of 24.6 percent of total savings. Regarding the sectoral breakdown of aggregate investment, Table 9 also shows

that the share of total investment in agriculture is less than 1 percent, in industry 59 percent, and the remaining 40.0 percent of total investment is allocated to the other sectors of the economy. It is worth to note that only 0.012 percent share of total investment is allocated to both education and health.

Table 9

Saving-Investment Balance in 1989-90

	(Rs. Million)	(% of total savings/investment)
Households savings (SHH)	53845	33.0
Firms savings (SF)	37787	23.1
Government savings (SG)	-40165	-24.6
Foreign savings (CAB)	30494	18.7
Consumption of fixed capital (D_i)	81091	49.7
Total Saving (ST) (Gross)	163052	100.0
Investment in agriculture (IVA)	1458	0.9
Investment in industry (IV_i)	96225	59.0
Education (IVE)	7	0.004
Health (1VH)	14	0.008
Investment in other sectors (IV_O)	65348	40.0
Total Investment flTI	163052	100.0

4. DISAGGREGATION OF HOUSEHOLDS BY INCOME GROUPS

In the following sub-sections, we describe the theoretical and numerical perspectives of the disaggregation of urban and rural households by income groups in Pakistan.

4.1. Disaggregation of Households by Income Groups: A Theoretical Perspective

Aggregate households account in SAM 1989-90 (developed in the earlier section in Table 1) is disaggregated by four income groups for rural and urban areas of Pakistan separately. Both urban and rural households are distinguished into four income groups namely lowest income group having monthly income upto Rs.2500, low income group Rs.2501-4000, middle income group Rs.4001-7000 and high income group Rs.7001 & above. The structure of disaggregated SAM for 1989-90 is presented in Table 10. The disaggregation of the households turns the aggregate SAM 1989-90 of 21x21 matrix reported in Table 1 into 28x28 matrix which is presented in Table 10. Thus, rows 3 to 10 in Table 10 present the disaggregation of row 3 in Table 1 (aggregate income account of households).

These rows show the channeling of income from domestic production activities to various categories of factors of production and then to these households groups. Rows 3 to 10 also show other sources of income of the households i.e., income from capital, dividends from firms, transfers from the government and net transfers from the rest of the world. The respective columns 3 to 10 in Table 10 present the disaggregation of column 3 (aggregate expenditure of the households) in Table 1. These columns present the expenditure of above mentioned income groups on different commodities. In other words, columns 3 to 10 present demand of these households for agriculture, industry, education, health, and other commodities. First four columns (3-6 columns) in Table 10 show the demand of these commodities by urban households. While the later four columns (7-10 columns) present the expenditure by four rural income groups. Households' income and expenditure identities for rural and urban income groups can be written by balancing the rows with their respective columns as follows:

Urban Households

Income: $WHU_n + RKHUH + DIVHU_n + TCHtM + TRHU_n = Yhl_n$ ... ... **(21)**

Expenditure: $IDHU_n + DHUni + SHUn = YHU_n$ ... ... **(22)**

Rural Households

Income: $W'_{HRI_n} + RKHR + DIVHR + TGHR + TRHR = YHRn$ ... ... (23)

Expenditure: $IDHRn + DHRni + SHR_n = YHR_n$ ... ... (24)

WHUn and RKHUn are labour income and capital income, respectively, received by nth income groups in urban areas of Pakistan. All these households also receive incomes from other institutions such as dividends from firms (DIVHUn), transfers from the government (TGHUn) and net transfers from die rest of the world ($T_{\wedge\wedge}$). Similalry, WHR_n and RKHRn are labour income and capital income, respectively, received by nth income groups in rural areas of Pakistan and incomes from other institutions for rural households are dividends from firms (DIVHRn), transfers from the government (TGHRn, and net transfers from the rest of the world (TRHRn). The disaggregation shows the distribution of income from different sources among various households groups. In accounting principal, income of households must be equal to households expenditure as mentioned in identities (21-24). Therefore, taxes paid to the government (IDHUn) and households consumption of goods and services (DHUnj) represent the total expenditure by the nth households groups in the urban areas on ith commodity and the rest is saved by the households as saving (SHUn). Similarly, IDHRn, (DHRj), and SHRn show the expenditure of nth income groups on indirect taxes paid to the government, expenditure on ith commodities and savings, respectively, by rural income groups in Pakistan.

Table 10

Structure of Social Accounting Matrix of Pakistan, 1989-90: Disaggregation of household Sector

		Factors of Production		Agents										
		Labour	Capital	HU1 (urban)	HU2 (urban)	HU3 (urban)	HU4 (urban)	HR1 (rural)	HR2 (rural)	HR3 (rural)	HR4 (rural)	Firms	Government	Rest of World
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Labour	(1)													
Capital	(2)													
HU1 (urban)	(3)	WHU_1	RK_{HU1}									DIV_{HU1}	T_{GHU1}	$TRHU_1$
HU2 (urban)	(4)	WHU_2	RK_{HU2}									DIV_{HU2}	$TGHU_2$	$TRHU_2$
HU3 (urban)	(5)	WHU_3	$RKHU_3$									$DIVHU_3$	$TGHU_3$	T_{RHU3}
HU4 (urban)	(6)	WHU_4	RK_{HU4}									$DIVHU_4$	$TGHU_4$	$TRHU_4$
HR1 (rural)	(7)	WHRI	RK_{HR1}									DIV_{HR1}	TGHRI	T_{RHRi}
HR2 (rural)	(8)	WHR_2	RK_{HR2}									DIV_{HR2}	TGH_{R2}	$TRHR_2$
HR3 (rural)	(9)	WHR_3	RK_{HR3}									$DIVHR_3$	$TGHR_3$	$TRHR_3$
HR4 (rural)	(10)	WHR_4	$RKHR_4$									DIV_{HR4}	$TGHR_4$	$TRHR_4$
Firms	(11)		RKF										TGF	
Government	(12)		RKG	IDHU!	$IDHU_2$	$IDHU_3$	$1DHU_4$	IDHRI	If/\HR2	$1DHR_3$	$IDHR_4$	IDp		TRG
Rest of World	(13)											T_{FR}		
Agriculture	(14)												SUBA	
Industry	(15)												SUB_I	
Education	(16)												SUBE	
Health	(17)												SUBH	
Other Sectors	(18)												SUB_O	
Agriculture	(19)			D_{HU1A}	$/\_{HU2A}$	DHU_{3A}	DHU_{4A}	DHR_{1A}	DHR_{2A}	DHR_{3A}	DHR_{4A}		DG_A	
Industry	(20)			DHUII	DHU_{21}	$/\_{HU3I}$	C_{HU4I}	$/\_{HRM}$	DHR_{2I}	$/\_{HR3I}$	D_{HR4I}		DG_I	
Education	(21)			DHUIE	DHU_{2E}	DHU_{3E}	$D_{»U4E}$	$I/\_{HRIE}$	DHR_{2E}	$E*_{HR3E}$	DHR_{4E}		DGe	
Health	(22)			DHUIH	DHU_{2H}	DHU_{3H}	DHU_{4H}	$I/\_{HRIH}$	DHR_{2H}	$t>_{HR3H}$	DHR_{4H}		DGH	
Other Sectors	(23)			DHUIO	D_{HU20}	DHU_{30}	DHU_{40}	DHRIO	DHR_{2O}	DHR_{30}	DHR_{40}		DG_O	
Agriculture	(24)													ETA
Industry	(25)													ETi
Health	(26)													ETH
Other Sectors	(27)													ET_O
Accumulation	(28)			SHUI	SHU_2	SHU_3	SHU_4	SHR_1	SHR_2	SHR_3	SHR_4	SF	SG	CAB
Total	(29)	W	RK	Y_{HU1}	YHU_2	$Yfflj_3$	YHU_4	VHR_I	YHR_2	YHR_3	YHR_4	YF	YG	RR

Continued—

Table 10—(*Continued*)

Total Production					Goods for Domestic Market					Goods for Exports Market				Accumulation	
Agriculture (14)	Industry (15)	Education (16)	Health (17)	Other Sectors (18)	Agriculture (19)	Industry (20)	Education (21)	Health (22)	Other Sectors (23)	Agriculture (24)	Industry (25)	Health (26)	Other Sectors (27)	Accumulation (28)	Total (29)
WA	W_1	WE	WH	W_O											W
RKA	RK_1	RKE	RKH	RK_O											RK
															YHU_1
															YHU_2
															YHU3
															YHU_4
															YHR1
															YHR_2
															YHR_3
															YHR_4
IIA	II_1	HE	IIH	HO	TMA	TM_1	TME	TMH	TM_O						Yp
					MA	M_1	ME	MH	M_O						YG
					VDA					ETA					RR
						VD_1					ET_1				VXAS
							VDE								VX_1^S
								VDH				ETH			VX_E^S
															VX_H^S
									VD_O				ET_O		VX_O^S
ICAA	ICAI	IC_{AE}	ICAH	ICAO										IVA	VXAD
IC_{1A}	IC_{11}	IQE	IC_{1H}	IQo										IV,	VX_1^D
IC_{EA}	ICE,	ICEE	ICEH	ICEO										rvE	VX_E^D
IC_{HA}	ICH,	IC_{HE}	ICHH	ICHO										IVH	VX_H^D
IC_{OA}	IC0,	IC_{OE}	IQ_{DH}	ICQO										IV_O	VX_O^D
															ETA
															ET_1
															ETH
															ET_O
DA	D_1	DE	DH	DQ											ST
VXAS	VX_1^S	VXES	VXHS	VX_O^S	VXAD	VX_1^D	VXED	VXhD	VXQD	ETA	ET_1	ETH	ET_O	IT	

4.2. Disaggregation of Households by Income Groups: A Numerical Presentation

Table 11 present SAM-1989-90 with disaggregation of household sector by income groups for rural and urban areas of Pakistan. Receipts and expenditures of urban and rural income groups are presented in it. Rows 3 to 10 in Table 11 show distribution of income from different sources among the rural and urban households of Pakistan by the nth income groups. Similarly, columns 3 to 10 provide structure of consumption of goods by sector of origin of these households. Detailed patterns of income and expenditure of these income groups are given in Tables 12 to 19, which are derived from Table 11. These Tables show percentage distribution of income and expenditure across income groups and within income groups for rural and urban areas of Pakistan. The patterns of income and expenditure of various income groups are briefly described as follows.

4.2.1. Income Distribution by Sources of Income

Table 12 presents percentage distribution of income from different sources across the income groups in urban areas of Pakistan. It shows that 43.1 percent households are in the lowest income group, who earns upto Rs.2500 per month. While the second and third income groups who earn between Rs.2501-4000 and Rs.4001-7000 per month, respectively, consist of 29.1 percent and 19.2 percent of total urban households. The highest income group contains only 8.3 percent of total households. Table 12 also shows that the highest income group receives highest percentage of total income i.e., 31 percent (although the minimum percentage of households lie in this group). On the other hand, maximum percentage of households lies in the lowest income group but they receive minimum percentage of total income i.e. only 18 percent of total income).

Pakistan is a labour abundant country and labour power is the main source of income specially for the poor people. Second row of Table 12 shows that 43.1 percent poorest households receive 24.4 percent of total wages and salaries and 8.3 percent richest households receive *21.9* percent of total wages and salaries. While 48.4 percent of total households (both low and middle income groups) receive about 53.8 percent of total wages and salaries. Table 12 also shows that the high income group receives the highest share almost from all other sources, i.e., capital income (28.6 percent), dividends from firms (56.2 percent), transfers from the government (52.2 percent) arid net transfers from the rest of the world (63 percent). On the other hand, the lowest income group (but the highest percentage of households) receives lowest share from the other sources of income, i.e. 17.6 percent as capital income, 3.2 percent as dividends from firms, 16.2 percent as transfers from the government, and only 2.7 percent as transfers from the rest of the world. Thus, it presents a clear picture of skewed income distribution in urban areas of Pakistan.

Table 11

Social Accounting Matrix of Pakistan, 1989-90: Disaggregation of Household Sector

		Factors of Production		Agents										
		Labour	Capital	HU1 (urban)	HU2 (urban)	HU3 (urban)	HU4 (urban)	HR1 (rural)	HR2 (rural)	HR3 (rural)	HR4 (rural)	Firms	Government	Rest of World
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Labour	(1)													
Capital	(2)													
HU1 (urban)	(3)	32446	25252									680	681	763
HU2 (urban)	(4)	37200	35573									3403	445	2980
HU3 (urban)	(5)	34383	41347									5150	884	6860
HU4 (urban)	(6)	29121	41005									11842	2191	18069
HR1 (rural)	(7)	38959	59032									2719	786	2821
HR2 (rural)	(8)	17847	57223									4325	419	3962
HR3 (rural)	(9)	13040	60586									6231	263	3993
HR4 (rural)	(10)	6293	51040									14209	3556	7962
Firms	(11)		86339										45308	
Government	(12)			126	329	640	649	255	127	204	1079	24588		11544
Rest of World	(13)											20713		
Agriculture	(14)												0	
Industry	(15)												4742	
Education	(16)												2	
Health	(17)												0	
Other Sectors	(18)												3534	
Agriculture	(19)			25837	27784	24995	16085	47929	28600	22050	10618		0	
Industry	(20)			33485	36436	34039	23174	59768	35334	28120	13805		0	
Education	(21)			406	742	851	1363	404	366	337	204		14137	
Health	(22)			556	606	637	327	1004	594	549	276		4231	
Other Sectors	(23)			17820	21677	22181	24415	24758	16347	14642	9166		102438	
Agriculture	(24)													3867
Industry	(25)													102210
Health	(26)													9
Other Sectors	(27)													22386
Accumulation	(28)			-18408	-7973	5281	36215	-29801	2408	18211	47912	37787	-40165	30494
Total	(29)	209289	457397	59822	79601	88624	102228	104317	83776	84113	83060	131647	143452	217920

Continued—

Table 11—(*Continued*)

Total Production					Goods for Domestic Market					Goods for Exports Market				Accumulation	
Agriculture (14)	Industry (15)	Education (16)	Health (17)	Other Sectors (18)	Agriculture (19)	Industry (20)	Education (21)	Health (22)	Other Sectors (23)	Agriculture (24)	Industry (25)	Health (26)	Other Sectors (27)	Accumulation (28)	Total (29)
45681	45415	13883	2839	101471											209289
157847	83837	2613	2815	210285											457397
															59822
															79601
															88624
															102228
															104317
															83776
															84113
															83060
															131647
1557	44845	2	4	13799	857	42844	0	0	3						143452
					12378	166554	0	122	18153						217920
					353501					3867					357368
						568520					102210				675472
							19044								19046
								8914				9			8923
									608584				22386		634504
49893	103486	175	0	7826										1458	366736
37381	227552	505	2110	149984										96225	777918
0	82	33	0	112										7	19044
12	31	0	176	23										14	9036
55832	149439	999	670	101008										65348	626740
															3867
															102210
															9
															22386
9165	20785	836	309	49996											163052
357368	675472	19046	8923	634504	366736	777918	19044	9036	926740	3867	102210	9	22386	163052	

Table 12

Percentage Shares of Income by Different Sources Across Urban Households

Sources of income	Households by income groups				
	up to Rs.2500	Rs.2501-4000	Rs.4001-7000	Rs.7001 & above	Total
Percentage shares of households	43.08	29.12	19.23	8.25	100
Wage and salaries	24.37	27.94	25.82	21.87	100
Capital income	17.64	24.85	28.88	28.64	100
Dividends from firms	3.23	16.15	24.44	56.19	100
Transfers from the government	16.21	10.59	21.04	52.16	100
Transfers from the rest of the world	2.66	10.39	23.93	63.02	100
Total	18.11	24.10	26.83	30.95	100

Table 13 presents the percentage shares of total income within an income group from different sources. First column of Table 13 shows that the main source of income of the poorest household is wages and salaries i.e. 54.2 percent of their total income comes from wages and salaries and 42.2 percent of their total income comes from capital. The remaining income of the lowest income group is received as dividends from firms (1.1 percent), transfers from the government (1.1 percent) and transfers from the rest of the world (1.3 percent). The richest group of households earns 28.5 percent from wages and salaries and 40.1 percent from the capital income. It is worth noting that as contrast to the lowest income group, high income group receives largest share from capital income. The incomes of this group from other sources are also higher than the income of the lowest income group. It receives 11.6 percent of their total income from firms as dividends, 2.1 percent as transfers from the government and 17.7 percent as transfers from the rest of the world.

Table 13

Percentage Shares of Income by Different Sources Within Urban Households

Sources of Income	Households by Income Groups			
	up to Rs.2500	Rs.2501-4000	Rs.4001-7000	Rs.7001& above
Percentage of households	43.08	29.12	19.23	8.25
Wage and salaries	54.24	46.73	38.80	28.49
Capital income	42.21	44.69	46.65	40.11
Dividends from firms	1.14	4.27	5.81	11.58
Transfers from the government	1.14	0.56	1.0	2.14
Transfers from the rest of the world	1.28	3.74	7.74	17.68
Total	100	100	100	100

Table 14 shows the percentage distribution of income across the rural income groups from different sources. It shows that 59.8 percent of aggregate households in rural areas are in the lowest income group and only 4.5 percent households are in the high income group. Table 14 shows that 51.2 percent of total wages and salaries in mral areas is earned by poorest households. On the other hand, the high income group receives 8.3 percent of total wages and salaries.

Table 14 also shows that 25.9 percent income from capital accrues to poorest income group and 22.4 percent to richest households. The largest shares from firms as dividends (51.7 percent), transfers from the government (70.8 percent) and transfers from the rest of the world (42.5 percent) go to the richest households group. The lowest income group receives 9.9 percent of total dividends as dividends from firms, 15.6 percent of total transfers as transfers from the government and 15.1 percent as transfers from the rest of the world. It is worth to note that 70.8 percent of total government transfers is going to the richest households while only 15.6 percent government transfers go to the poorest households.

Table 14

Percentage Shares of Income by Different Sources Across Rural Households

Sources of income	Households by income groups				
	up to Rs.2500	Rs.2501-4000	Rs.4001-7000	Rs.7001& above	Total
Percentage of households	59.80	22.10	13.58	4.46	100
Wage and salaries	51.17	23.44	17.13	8.27	100
Capital income	25.90	25.11	26.59	22.40	100
Dividends from Firms	9.89	15.74	22.67	51.70	100
Transfers from the government	15.64	8.35	5.24	70.77	100
Transfers from the rest of the world	15.06	21.14	21.31	42.49	100
Total	29.36	23.58	23.68	23.38	100

Table 15 shows income received by rural income groups from different sources as percentage of their respective incomes. All income groups in rural areas earn highest income from capital. It contributes 56.6 percent, 68.3 percent, 72 percent, and 61.5 percent in incomes of the lowest, low, middle, and high rural income groups, respectively. Table 15 also shows that lowest income group receives 37.4 percent of their total income from wages and salaries. While the highest group receives 7.6 percent of their total income from wages and salaries. It is worth to note from Table 15 that as mral households monthly income level increases, percentage shares in dividends from firms and percentage shares in transfers from the rest of the world also increase. These groups from the lowest to the highest income groups receive 2.6 percent, 5.2 percent, 7.4 percent and 17.1 percent of their respective income as dividends from firms, respectively. Transfers from the government as percentage of the household income are 4.3 percent to the high income group, 0.3 percent to the middle income group, 0.5 percent to the low income and 0.8 percent to the lowest income group. It is worth noting that shares of wages and salaries in households total income fall as income rises and shares of income from all other sources increase as monthly incomes of rural households rise.

Table 15

Percentage Shares of Income by Different Sources Within Rural Households

Sources of income	Households by income groups			
	up to Rs.2500	Rs.2501-4000	Rs.4001-7000	Rs.7001& above
Percentage shares of households	59.80	22.10	13.58	4.46
Wage and salaries	37.35	21.30	15.50	7.58
Capital income	56.59	68.30	72.03	61.45
Dividends from firms	2.61	5.16	7.41	17.11
Transfers from the government	0.75	0.50	0.31	4.28
Transfers from the rest of the world	2.70	4.73	4.75	9.59
Total	100	100	100	100

4.2.2. Expenditure by Different Income Groups

Tables 16 shows uses of households income by various urban income groups. It shows that expenditure on agriculture is 27.3 percent by the lowest income group and 17.0 percent by the highest income group in urban areas. Expenditures on manufacturing products are 18.2 percent and 26.3 percent of total expenditure by the high and lowest income groups, respectively. Fourth row in Table 16 also shows expenditure on education by different urban income groups. It is worthwhile to note that the expenditure on education rises with the rise of income levels, i.e., 40.6 percent of total expenditure by the high income group and only 12.1 percent of total expenditure by the lowest income group. The order is reverse for expenditure on health as the lowest income group spends 26.2 percent and high income group 15.4 percent of total expenditure on health. Expenditure on commodities other than mentioned above is high by the highest income group and low by the lowest income group. In Pakistan tax system is progressive, so the highest share in total taxes (37.2 percent) is paid by the high income group (as the highest income group receives highest share from total income 31 percent of total income). While the lowest income group pays 7.3 percent of total taxes in urban areas. Similarly, households with high income contribute lions' share to total households saving while lowest and low income groups have negative savings as reported in Table 16.

Table 16

Uses of Incomes by Urban Households

Uses of Incomes	Income Groups				
	up to Rs.2500	Rs.2501-4000	Rs.4001-7000	Rs.7001 & above	Total
Percentage of households	43.08	29.12	19.23	8.25	100
Agriculture	27.28	29.34	26.39	16.98	100
Manufacturing	26.34	28.66	26.77	18.23	100
Education	12.05	22.08	25.32	40.55	100
Health	26.15	28.50	29.96	15.38	100
Others	20.70	25.18	25.76	28.36	100
Taxes paid	7.25	18.84	36.71	37.20	100
Saving	-121.78	-52.75	34.94	239.59	100
Total	18.11	24.10	26.83	30.95	100

Table 17 presents the percentage expenditure by various urban income groups. It reveals that the largest share of incomes of all income groups is spent on manufactured products such as 56 percent by the lowest income group, 45.8 percent by the low income group, 38.4 percent by the middle income group and 22.7 percent by the high income group.

Table 17

Uses of Income Within Urban Households

Uses of Income	Income Groups			
	up to Rs.2500	Rs.2501-4000	Rs.4001-7000	Rs.7001 & above
Percentage of households	43.08	29.12	19.23	8.25
Agriculture	43.19	34.90	28.20	15.73
Manufacturing	55.97	45.77	38.41	22.67
Education	0.68	0.93	0.96	1.33
Health	0.93	0.76	0.72	0.32
Others	29.79	27.23	25.63	23.88
Taxes paid	0.21	0.41	0.72	0.63
Saving	-30.77	-10.02	5.96	35.43
Total	100.0	100.0	100.0	100.0

The second highest expenditure is on agriculture products by all income groups. Lowest, low, middle and high income groups, respectively, spend 43.2 percent, 34.9 percent, 28.2 percent and 15.7 percent of their total income on agriculture. Comparison of the percentage expenditure on education by these income groups shows that it increases with the rise of income levels but conversely percentage expenditure on health declines with the rise of income levels. The poorest group of households spends 0.7 percent of their total income on education and 0.9 percent of their income on health. While the richest income group spends 1.3 percent of their income on education and 0.3 percent of their income on health. Low and middle income groups spend 0.9 percent and 1.0 percent of their income on education and 0.8 percent and 0.7 percent on their health, respectively. Table 17 also shows that the lowest and low income groups are net dissaver as negative 30.8 percent and negative 10 percent of their expenditure are financed by consuming existing assets or through borrowing. While the highest income group saves 35.4 percent of their total income.

Table 18 presents expenditure pattern of rural households where 60 percent of total population live. It shows almost the similar pattern in expenditure as is found in the case of urban income groups. It clearly shows that the highest shares of total expenditure on agriculture and manufactured commodities are spent by the poorest income group. It is worth noting that as income level increases, the expenditures on these two commodities decline. The same patterns are found in expenditures on education, health and others commodities. As is the case of urban

income groups, the largest share in taxes paid to the government is by the high income group. The same is the case with households savings. The first two income groups are dissaver as their savings are negative 76.9 percent and 6.2 percent of total saving. But the later two income groups are net saver and largest contribution to the household saving is by the high income group.

Table 18

Uses of Income by Rural Households

Uses of Income	Income Groups				
	up to Rs.2S00	Rs.2S01-4000	Rs.4001-7000	Rs.7001 & above	Total
Percentage of households	59.80	22.10	13.58	4.46	100
Agriculture	43.89	26.19	20.19	9.72	100
Manufacturing	43.62	25.79	20.52	10.07	100
Education	30.82	27.92	25.71	15.56	100
Health	41.44	24.52	22.66	11.39	100
Others	38.14	25.18	22.56	14.12	100
Taxes paid	15.31	7.654	12.24	64.80	100
Saving	-76.94	-6.22	47.02	123.70	100
Total	29.36	23.58	23.68	23.38	100

Table 19 shows the pattern of expenditure within the rural income groups. It reveals that the lowest income group spends 45.9 percent of total expenditure on agriculture and 57.3 percent on manufactured commodities. Table 19 also shows that as income rises percentage expenditure of total expenditure on these commodities declines. The expenditures on agriculture commodities are 34.1 percent, 26.2 percent, and 12.8 percent of total expenditure by low, middle and high income groups of their total expenditure, respectively. Similarly, expenditures on manufactured commodities are 42.2 percent, 33.4 percent, and 16.6 percent of total expenditure by the low, middle, and high income groups. Expenditure on education by all these income groups is less than 0.5 percent of their income. The same is case for the health expenditure by all income groups. It is also worth noting that the expenditure on health as percentage of their total income declines as income level rises. The high income group pays 1.3 percent of its income as taxes to the government. While the lowest, low and middle income groups pay less than 0.5 percent of their incomes as taxes to the government. Lowest rural income group is a dissaver as last row of Table 19 shows 28.6 percent dissaving of this group, which means that it spends more than its income. The other three rural income groups save, respectively, 2.9 percent, 21.7 percent and 57.7 percent of their incomes. It is also worth noting that high income group in rural areas saves 57.7 percent of its income as compared to the urban high income group, who saves 35.4 percent of its income.

Table 19

Uses of Income Within Rural Households

Uses of Income	Income Groups			
	up to Rs.2500	Rs.2501-4000	Rs.4001-7000	Rs.7001 & above
Percentage of households	59.80	22.10	13.58	4.46
Agriculture	45.94	34.14	26.21	12.78
Manufacturing	57.29	42.18	33.43	16.62
Education	0.39	0.44	0.40	0.25
Health	0.96	0.71	0.65	0.33
Others	23.73	19.51	17.41	11.03
Taxes paid	0.24	0.15	0.24	1.30
Saving	-28.57	2.87	21.65	57.68
Total	100.0	100.0	100.0	100.0

5. MULTIPLIER ANALYSIS

The mosfcommon feature of compiling a social accounting matrix is that it can be used to calculate impact multipliers of socio-economic linkages in an economy. Pyatt and Round (1985) provided a comprehensive measure of multiplier effects, which is used here. This measure provides average propensities of endogenous and exogenous accounts, Leontief input-output multipliers, aggregate multipliers and leakage multipliers in a general equilibrium framework. The aggregate multiplier can be further decomposed in order to derive the direct and indirect effects and the main causal linkages underlying the structure of the economy. The procedure to calculate the multiplier effects is as follows. First, the SAM for Pakistan for the year 1989-90 reported in Table 11 is divided into exogenous and endogenous accounts. Here, we consider government, rest of the world, and capital accumulation as exogenous accounts while all other accounts in the SAM are treated as endogenous accounts. The total income of endogenous accounts (Y_n) is given by the sub total of income of endogenous accounts (N) – matrix of SAM transactions between endogenous accounts – plus sub total of income of exogenous accounts (X) – matrix of injections from exogenous into endogenous accounts. So we can write down the equation for total income of endogenous accounts as follows:

$$Y_n = N + X \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (25)$$

In die SAM framework, there is linear proportional relationships between particular expenditures and their corresponding totals, which are called average propensity to spend (AJ, which can be calculated as dividing each cell of endogenous accounts by its respective column sum. The matrix of the sub total of income of endogenous accounts (N) can be calculated as follows:

$$N = A_{nn} \cdot Y_n \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (26)$$

Substituting equation (26) into equation (25) and rearranging it we get:

$$Y_n = (I - AJr' . X = Ma.X \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (27)$$

Where M, is aggregate multiplier. Similarly, total income of exogenous accounts (YJ consists of matrix of leakages frpm endogenous accoimts into exogenous accoimts (L) and matrix of SAM transactions between exogenous accounts (R), which can be written as:

$$Y_X = L + R \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (28)$$

The average propensities to leake $(A_,)$ can be calculated as dividing each cell of exogenous accounts by its respective column sum. The matrix of average propensities to leak from endogenous accounts can be calculated from the following equation:

$$L = A_, . Y_„ \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (29)$$

Substitutiiig equation (27) for $Y_„$ into equation (29) we get:

$$L = A_, . Ma . X \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (30)$$

Where $(A_,.MJ$ is aggregate leakage multiplier matrix for exogenous accounts. Incorporating equation (30) for L into equation (28) we get total income of exogenous accounts (Y_X) with its aggregate leakage multiplier matrix as follows:

$$Y_X = A_, . Ma . X + R \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (31)$$

In order to decompose aggregate multiplier (MJ into intra-group effects, extra-group effects and cross effects, we need to define a block diagonal matrix $A_\wedge$ which is a matrix of coefficients of endogenous accounts including elements at the intersection of different groups of accounts in order to identify different multiplier effects. Therefore, the matrix of average propensities to spend (AJ pan be further partioned into matrix of diagonal elements $(A_\wedge)$ and matrix of off-diagonal elements $(A_\wedge$, which is written as follows:

$$An = A_a + Ans \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad — \quad (32)$$

After defining $A_{„0}$ and $A_{„5}$, the aggregate multiplier matrix (MJ can be decomposed into three components such as intra-group effects (Mal), extra-group effects $(M_\wedge)$, cross effects (Mtf), which are written as follows:

$$Mal = (I - AJ' \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (33)$$

$$Ma: = (I + AlK + Aj) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (34)$$

$$Ma_3 = (I - Aj)^{-1} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (35)$$

Where Mal captures the effects of one group on itself through direct transfers and M_{a2} captures the cross-effects of the multiplier process whereby an injection into one account of the system has repercussions on the other accounts. Matrix M_{a3} shows the full circular effects of an injection going round the system and back to its point of origin in a series of repeated and dampening cycles. Thus, equation (27) can be rewritten as follows:

$$Yn = (MaI \cdot Ma_2 \cdot Ma_3) \cdot X \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (36)$$

Pyatt and Round respecify equation (32) as:

$$Y_{n} = (1 + T + O + C) \cdot X \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (37)$$

Where I is referred as initial impulse or identity multiplier, T as transfer multiplier, O as open-loop multiplier, and C as closed -loop multiplier, which can be written in algebraic forms as follows:

$$T = (Ma, - I) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (38)$$

$$O = (Ma, - I) \cdot Ma, \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (39)$$

$$C = (Ma_3 - I) \cdot Ma_2 \cdot Ma, \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (40)$$

The estimates of all the above mentioned equations (25) to (40) are presented in Appendix Tables 1 to 14 which are briefly discussed. Appendix Table 1 shows the average propensities to expenditure for endogenous accounts (AJ while average propensities to leak for exogenous accounts (A,) are reported in Appendix Table 2. Appendix Table 3 presents block diagonal elements (An_0), which are the matrix of coefficients of endogenous accounts including elements at the intersection of different groups of accounts and they identify as intra-group multiplier effects. Appendix Table 4 presents aggregate multipliers (MJ. Leakage multiplier matrix (Aj.MJ is presented in Appendix Table 5, which shows that, in aggregate, injections into the system are equal to the leakages[6]. Appendix Tables 6 to 8 present the decomposition of aggregate multipliers into intra-group or direct effects (Ma,), extra-group or own indirect effects ($M_{\wedge}$), and cross effects ($M_{\wedge}$), respectively. Further decomposition of aggregate multiplier effects into transfer multiplier effects (T), open-loop multiplier effects (O), and closed-loop multiplier effects (C) are reported in Appendix Tables 9 to 11, which are also summarised in

[6] For detail on further derivation see Pyatt and Round (1985)

Appendix Table 12. Furthermore, multiplier effects by types of endogenous accounts are reported in Appendix Tables 13 and 14.

On the basis of above mentioned Appendix Tables, the results of the multipliers are summarised in Table 20, which are of our great interest. The values in columns 1 to 5 give the 'backward linkages' of the endogenous accounts, which indicate the measure of the opportunities offered to suppliers arising from marginal changes in the final demand (i.e. one unit increase in exogenous accounts). While the vector of the sum of rows in Table 20 gives the 'forward linkages' which give the total effect on endogenous accounts of a unit change in all exogenous accounts. Thus, these accounting multipliers show the effect of injections into the system through exogenous accounts on endogenous accounts. Table 20 also shows that the multipliers for all endogenous accounts imply a high degree of integration of the accounts in Pakistan's economy. For the production sectors, backward linkages are strongest for the education, followed by agriculture, health, other sectors and industry. The largest forward linkage multipliers are found for industry, followed by other sectors, agriculture, health, and education. Regarding the households income groups, the largest backward linkage is found for the urban poorest (HU1 having income less than Rs.2500 per month) and smallest for the rural rich (HR4 having income more than Rs.7000 per month). While the largest forward linkage is for the rural poorest (HR1 having income less than Rs.2500 per month) and smallest for the urban poorest (HU1 having income less than Rs.2500 per month).[7]

The linkages between the accounts of the SAM can also be analysed by decomposing the aggregate multiplier effects into the intra-group effects (the effect of an exogenous injection into the group of accounts where it was originally entered); open-loop effects (the first round of extra-group or cross effects of an injection outside the group of accounts where the injection was originally entered); closed-loop effect (the circular or inter group effects starting with repercussions of the extra group effects on the original accounts and die subsequent round effects). The breakdown of aggregate multipliers is also reported in Table 20. Columns 2 and 7 in Table 20 show the initial impulse (i.e. unit increase), which is the amount injected into endogenous accounts through exogenous accounts. Table 20 shows the various degree of impacts of this injected unit on all the endogenous accounts. Starting from backward linkages, for example, transfer multiplier in column 3 is 0.369 only for the firms while for all other accounts the values are zeros. Columns 4 and 5 in Table 20 reports open-loop multipliers and closed-loop multipliers, which show the impact of an injection before reaching the original account and after reaching the original account, respectively. Regarding the households income groups, open-loop and closed-loop multipliers are highest for the poorest income groups in urban and rural areas and smallest for the richest income groups in both

[1] The multipliers need to be interpreted with caution because of several restrictive assumptions underlying the multiplier methodology.

Table 20

Decomposition of Total Multiplier Effects

	SUM COLUMNS OF MATRIX M, (backward linkages)					SUM ROWS OF MATRIX M, (forward linkages)				
	Aggregate Multiplier (M,) (1)	Initial Inpulse f]) (2)	Transfer Multiplier (T) (3)	Open-Loop Multiplier (O) (4)	Closed-loop Multiplier (C) (5)	Aggregate Multiplier (M,) (6)	Initial Impulse (I) (7)	Transfer Multiplier (T) (8)	Open-Loop Multiplier (O) (9)	Closed-loop Multiplier (C) (10)
Labour	12.436	1.000	.000	2.022	9.414	11:099	1.000	000	2.772	7.326
Capital	10.095	1.000	.000	1.856	7.240	24,141	1.000	.000	2.637	17.505
HU1 (urbffli)	14.310	1.000	.000	2.436	10.874	3.914	1.000	.005	.504	2.404
HU2 (urban)	12.199	1.000	.000	2.048	9.151	4.746	1.000	.026	.621	3.099
HU3 (urban)	10.540	1.000	.000	1.745	7.794	4.930	1.000	.039	.624	3.266
HU4 (wban)	7.607	1.000	.000	1.205	5.402	4.889	1.000	.090	.585	3.214
HR1 (rural)	14.053	1.000	.000	2.389	10.664	5.898	1.000	.021	.760	4.117
HR2 (rural)	10.890	1.000	000	1.808	8.082	4.755	1.000	.033	.513	3209
HR3 (rural)	8.969	1.000	.UOO	1.458	6.511	4.728	1.000	.047	,482	3.199
HR4 (rural)	5.199	1.000	.000	.768	3.431	4231	1.000	.108	.382	2.741
Firms	4.119	1.000	.369	.503	2.248	4.991	1.000	.000	.444	3.547
Pro. Agriculture	11.297	1.000	.000	1.933	8.364	19.726	1.000	.000	3.671	15.055
Pro. Industry	10.169	1.000	.000	1.712	7.457	24.537	1.000	.000	3.781	19.756
Pro. Education	12.379	1.000	.000	1.913	9.466	2.267	1.000	.000	1.058	.209
Pro. Health	11.193	1.000	.000	1.886	8.307	2289	1.000	.000	1.061	228
Pro., Oth. Sectors	10215	1.000	.000	1.753	7.462	22.177	1.000	.000	3.410	17.767
Dem Agriculture	11.889	1.000	.000	1.899	8.990	19.427	1.000	.000	3.666	14.761
Dem Industry	8.432	1.000	.000	1.391	6.041	32.206	1.000	.000	5.773	25.433
Dem. Education	13.379	1.000	.000	1.956	10.423	1267	1.000	.000	.073	.194
Dem Health	12.042	1.000	.000	1.938	9.103	1.307	1.000	.000	.108	.198
Dem Oth. Sectors	10.920	1.000	.000	1.844	8.075	21.809	1.000	.000	3.535	17.274

the areas, implying that any injection into exogenous accounts may have more impact on poorest than richest people. Regarding commodity producing sectors, the largest open-loop multiplier is for the agriculture and lowest for the industry. On the other hand, closed-loop multiplier is highest for the education followed by agriculture, health, other sectors, and industry. Similarly, regarding the forward linkages, transfers, open-loop, and closed-loop multiplier effects are reported in columns 8 to 10 in Table 20. It shows that the transfer multiplier is highest for the richest rural income group (HR4) and lowest for the poorest urban income group (HU1). Open-loop multipliers in column (9) show that among the income groups, the poorest rural households possess the maximum multiplier while the richest rural households hold die minimum multiplier impact. Regarding the commodity producing sectors, industry has the highest multiplier effect while education has the minimum multiplier effect. Finally, closed-loop multiplier effects reported in column 10 of Table 20 show that rural poorest income group holds the maximum multiplier and the poorest urban group possesses the minimum multiplier effect. Similarly, industry has die highest multiplier effect while education has the lowest multiplier impact.

6. CONCLUDING REMARKS

Given that the objective is to understand Pakistan's economy, the starting point is to design a social accounting matrix that, through appropriate choice of classifications, can capture its important characteristics. Therefore, the main objective of this study has been to compile a latest social accounting matrix for the year 1989-90, using the Integrated Institutional Accounts, Input-Output Table and Households Integrated Economic Survey for the same year. The matrix framework provides useful information about the structure of Pakistan's economy. Within this framework, the preferred classifications of various accounts are undertaken according to the policy objectives and later model building. In its present form, the matrix is not different in information contents from the national accounting system. A data base in a SAM format is relevant and useful for economic analysis of policy issues which concern various economic agents of the economy. The SAM presents four types of accounts: factors account, institutions account, production account, and capital account. These accounts are disaggregated on the basis of requirements and availability of data. Factors of production account is disaggregated into labour and capital accounts. Institutions accounts consist of households, firms (non-financial and financial), government, and rest of the world. Households account is further disaggregated by four income categories of rural and urban households. These accounts elaborate the inter-institutional linkages. Production account is disaggregated into agriculture, industry, education, health and other sectors.

Further disaggregation of production account is also made on the basis of goods for domestic market and for export market. Finally, it presents consolidated capital account. It is worth to note that earlier social accounting matrix for the year 1984-85 developed by the Federal Bureau of Statistics did not provide a disaggregation of the households sector. This limits the analysis of the households sector, particularly when distributive and redistributive aspects need to be given importance. Therefore, this paper fills this gap. In addition, the matrix is also used as a tool for multiplier analysis to provide backward and forward linkages in production, consumption, distribution and accumulation accounts. The multipliers for all endogenous accounts imply a high degree of integration of the accounts. For the production sectors, backward linkages are strongest for the education, followed by agriculture, health, other sectors and industry. The largest forward linkage multipliers are found for industry, followed by other sectors, agriculture, health, and education. Regarding the households income groups, the largest backward linkage is for the urban poorest and smallest for the rural rich. While the largest forward linkage is for the rural poorest and smallest for the urban poorest.

Definition of Notations Used in Appendix Tables 1 to 14

Notations	Definitions
FPLA1	Labour account
FPKA2	Capital account
CIHU1	Account of urban households (HU1 having income upto Rs.2500 per month)
CIHU2	Account of urban households (HU2 having income between Rs.2501-4000 per month)
CIHU3	Account of urban households (HU3 having income between Rs.4001-7000 per month)
CIHU4	Account of urban households (HU3 having income between Rs.7000 & above per month)
CIHR5	Account of rural households (HU1 having income upto Rs.2500 per month)
CIHR6	Account rural households (HU2 having income between Rs.2501-4000 per month)
CIHR7	Account of rural households (HU3 having income between Rs.4001-7000 per month)
CIHR8	Account of rural households (HU3 having income between Rs.7000 & above per month)
CIFI9	Firms account
CIG10	Government account
CIR11	Rest of the world account
PAAG1	Production of agriculture
PAIN2	Production of industry
PAED3	Production of education
PAHE4	Production of health
PAOT5	Production of other sectors
DDAG1	Domestic demand of agriculture goods
DDIN2	Domestic demand of industry goods
DDED3	Domestic demand of education
DDHE4	Domestic demand of health
DDOT5	Domestic demand of other sectors
XXAG1	Agriculture goods for export market
XXIN2	Industrial goods for export market
XXHE3	Health related goods for export market
XXOT4	Goods of other sectors for export market
KIAC1	Accumulation account

Appendix Table 1

Matrix of Average Propensities - Endogenous- Matrix A„

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIUR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAG1	PAIN2	PAED3	PAHE4	PAOT5	DDAG1	DDIN2	DDED3	DDHE4	DDOT5
FPLA1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.128	.007	.729	.318	.160	.000	.000	.000	.000	.000
FPKA2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.442	.124	.137	.315	.331	.000	.000	.000	.000	.000
CIHU1	.155	.055	.000	.000	.000	.000	.000	.000	.000	.000	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU2	.178	.078	.000	.000	.000	.000	.000	.000	.000	.000	.026	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU3	.164	.090	.000	.000	.000	.000	.000	.000	.000	.000	.039	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU4	.139	.090	.000	.000	.000	.000	.000	.000	.000	.000	.090	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR5	.186	.129	.006	.000	.000	.000	.000	.000	.000	.000	.021	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR6	.085	.125	.000	.000	.000	.000	.000	.000	.000	.000	.033	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR7	.062	.132	.000	.000	.000	.000	.000	.000	.000	.000	.047	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR8	3)30	.112	.000	.000	.000	.000	.000	.000	.000	.000	.108	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIFI9	.000	.189	.000	.000	.000	.000	.000	.006	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	000	.000	.000
PAAG1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.964	.000	.000	.000
PAIN2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.731	.000	.000	.000
PAED3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000
PAHE4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.986	.000
PAOT5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.971
DDAG1	.000	.000	.432	.349	.282	.157	.459	.341	.262	.128	.000	.140	.153	.009	.000	.012	.000	.000	.000	.000	.000
DDIN2	.000	.000	.560	.458	.384	.227	.573	.422	.334	.166	.000	.105	.337	.027	.236	.236	.000	.000	.000	.000	.000
DDED3	.000	.000	.007	.009	.010	.013	.004	.004	.004	.002	**.000**	.000	.000	.002	.000	.000	.000	.000	.000	.000	.000
DDHE4	.000	.000	.009	.008	.007	.003	.010	.007	.007	.003	.000	.000	.000	.000	.020	.000	.000	.000	.000	.000	.000
DDOT5	.006	.000	.298	.272	.250	.239	.237	.195	.174	.110	.000	.156	.221	.052	.075	.159	.000	.000	.000	.000	.000

Appendix Table 2

Matrix of Average Propensities - Exogenous- Matrix A_i

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAG1	PAIN2	PAED3	PAHE4	PAOTS	DDAG1	DDIN2	DDED3	DDHE4	DDOT5
CIG10	.000	.000	.002	.004	.007	.006	.002	.002	.002	.013	.187	.004	.066	.000	.000	.022	.002	.055	.000	.000	.000
C1R11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.157	.000	.000	.000	.000	.000	.034	.214	.000	.014	.029
XXAG1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
XXIN2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
XXHE3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
XXOT4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
KIAC1	.000	.000	-.308	.100	.060	-.354	-.286	.029	.217	.577	.287	.026	.031	.044	.035	.079	.000	.000	.000	.000	.000

Appendix Table 3

Matrix - Ano - Block Diagonal

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAG1	PAIN2	PAED3	PAHE4	PAOT5	DDAG1	DDIN2	DDED3	DDHE4	DDOT5
FPLA1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	000	.000	.000	.000	.000	.000
FPKA2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005	.000	.000	.000	.000	.000	**.000**	.000	.000	.000	.000
CIHU2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.026	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.039	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.090	.000	.000	.000	.000	.000	.000	.000	.000	.000	**.000**
CIHR5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.021	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR6	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.033	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.047	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR8	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.108	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIF19	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAAG1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAIN2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAED3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAHE4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	**.000**	**.000**	**.000**	**.000**	.000
PAOT5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	**.000**	**.000**	**.000**	**.000**	.000
DDAG1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDIN2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDED3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDHE4	.000	.000	.000	J000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDOT5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Appendix Table 4

Matrix - Ma = (I-AJ^{-1} = Ma$_3$. MaZ MaI, Aggregate Multiplier Matrix

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIF19	PAAG1	PAIN2	PAED3	PAHE4	PAOT5	DDAG1	DDIN2	DDED3	DDHE4	DDOT5	TOTAL
FPLA1	1.418	.321	.530	.449	.385	.274	.514	.392	.317	.168	.111	.495	.415	1.116	.673	.486	477	.303	LI16	.663	.472	11.099
FPKA2	1.003	1.771	1.279	1.075	.914	.632	1.256	.952	.766	.404	.264	1.329	.955	1.062	1.145	1.098	.1.281	.698	1.062	1.130	1.066	21.141
CIHIJ1	.276	.149	1.154	.130	.111	.078	.151	.114	.092	.049	.037	.151	.118	.233	.169	.137	.146	.086	.233	.166	.133	3.914
CIHU2	.335	.203	.200	1.169	.144	.101	.196	.148	.120	.063	.067	.198	.153	.2*6	.214	.177	.191	.112	.286	.211	.172	4.746
CIHU3	.331	.226	.212	.179	1.153	.107	.208	.158	.127	.067	.083	.211	.162	.167	.222	.187	.204	.118	.287	.219	.182	4.930
CIHTJ4	.304	.234	.210	.177	.151	1.105	.206	.156	.126	.066	.134	.211	.160	.26**	.216	.185	.203	.117	.269	.213	.179	4.889
CIHR5	.397	.295	.269	.227	.193	.135	1.263	.200	.161	.085	.076	.269	.204	.349	.277	.236	.259	.149	.349	.274	.230	5.898
C1HR6	.253	.260	.213	.180	.153	.106	.209	1.159	.128	.067	.077	.217	.161	.235	.208	.186	.209	.117	.235	.205	.180	4.755
CIHR7	.230	.270	.214	.180	.153	.106	.210	.159	1.128	.068	.092	.219	.161	.220	.204	.186	.211	.118	220	.201	.180	4.728
CIHR8	.175	.243	.185	.155	.132	.092	.181	.137	.111	1.058	.146	.190	.138	.174	.171	.160	183	.101	.174	.169	.155	4.231
CIFI9	.189	.334	.241	.203	.173	.119	.237	.180	.145	.076	1.050	.251	.180	.200	.216	.207	.242	.132	.200	.213	.201	4.991
PAAG1	1.046	.807	1.344	1.115	.932	.602	1.359	1.021	.809	.414	.271	1.916	.803	.943	.793	.705	1.847	.587	.943	.782	.685	19.726
PAIN2	1.284	.987	1.644	1.375	1.168	.783	1.626	1.224	.983	.512	.336	1.070	2.121	1.179	1.188	1.079	1.031	1.550	1.179	1.172	1.047	24.537
PAED3	.017	.012	.018	.019	.018	.019	.015	.013	.011	.006	.005	.011	.009	1.016	.012	.010	.011	.006	1.016	.012	.010	2.267
PAHE4	.016	.013	.021	.017	.015	.009	.021	.016	.013	.007	.004	.012	.009	.015	1.032	.010	Oil	.006	.015	1.018	.010	2.289
PAOT5	1.127	.865	1.425	1.220	1.057	.795	1.345	1.033	.849	.465	.304	1.039	1.004	1.070	.966	1.955	.1.002	.734	1.070	.953	1.898	22.177
DDAG1	1.085	.837	1.394	1.156	.967	.625	1.410	1.060	.839	.430	.281	.951	.833	.979	.823	.732	1.916	.609	.979	.812	.711	19.427
DDIN2	1.757	1.351	2.249	1.881	1.598	1.072	2.225	1.674	1.345	.700	.459	1.464	1.534	1.613	1.626	1.476	1.411	2.121	1.613	1.604	1.433	32.206
DDED3	.017	.012	.018	.019	.018	.019	.015	.013	.011	.006	.005	.011	.009	.016	.012	.010	.011	.006	1.016	.012	.010	1.267
DDHE4	.017	.013	.021	.018	.016	.009	.021	.016	.014	.007	.004	.012	.009	.015	.032	.010	.011	.006	.015	1.032	.010	1.307
DDOT5	1.161	.891	1.468	1.256	1.088	.818	1.385	1.064	.874	.479	.313	1.070	1.034	1.102	.995	.984	1.032	.756	1.102	.982	1.955	21.809
TOTAL	12.436	10.095	14.310	12.199	10.540	7.667	14.053	10.890	8.969	5.199	4.119	11.297	10.169	12.379	11.193	10.215	11.889	8.432	13.379	12.042	10.920	222.332

Appendix Table 5

Leakage Multiplier Matrix - At . Ma

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAG1	PAIN2	PAED3	PAHE4	PAOT5	DDAG1	DDIN2	DDED3	DDHE4	DDOT5
CIG10	.159	.236	.328	.278	.240	.165	.323	.244	.198	.115	.256	.240	.292	.244	.244	.246	233	.269	.244	.240	.239
CIR11	.476	.396	.609	.510	.434	.293	.602	.454	.365	.190	.282	.416	.415	.442	.439	.402	.435	.517	.442	.447	.419
XXAG1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
XXIN2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
XXHE3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
XXOT4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
KIAC1	.264	.368	.062	.212	.126	.542	.075	.303	.438	.694	.461	.344	.293	.314	.317	.352	.332	.214	.314	.313	.342
TOTAL	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Appendix Table 6

Matrix - Mal = (I-Ana)-1, - Direct Effects (Intra-Group Effects)

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAG1	PAIN2	PACD3	PAHE4	PAOT5	DDAG1	DDIN2	DDED3	DDHE4	DDOT5
FPLA1	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
FPKA2	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	000	.000	.000	.000	.000
CIHU1	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU2	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.026	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU3	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.039	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU4	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.090	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR5	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.021	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR6	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.033	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHR7	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.047	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
C1HR8	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.108	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIFI9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAAG1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PA1N2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000
PAED3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.000
PAHE4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.000
PAOT5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.000
DDAG1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.000
DDIN2	.000	.000	.000	.000	.000	.000	.000	.000	000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
DDED3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.000
DDHE4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.000
DDOT5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.000

Appendix Table 7

Matrix - $Ma_2 = (I + An_s + An_s^2)$, Own Indirect Effects (Extra-Group Effects)

	FPLAI	FPKA2	CIHU1	CIHU2	CIHU3	C1HU4	CIHR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAGI	PADV2	PAED3	PAHE4	PAOT5	DDAGI	DDIN2	ODED3	DDHE4	DDOT5
FPLAI	1.000	.000	.000	.000	.000	**.000**	.000	.000	.000	.000	.000	.128	.067	.729	.318	.160	.123	.049	.729	.314	.195
FPKA2	.000	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.442	.124	.137	.315	.331	426	.091	.137	.311	.322
CIHU1	.155	.056	1.000	.000	.000	.000	.000	.000	.000	.000	.000	.045	.017	**.121**	.067	.043	.000	.000	.000	.000	.000
CIHU2	.178	.083	**.000**	**1.000**	**.000**	.000	.000	.000	.000	.000	.000	.059	.022	.141	.083	.056	.000	.000	.000	.000	.000
C1HU3	.164	.098	.000	.000	1.000	.000	.000	.000	.000	.000	.000	.064	.023	.133	.083	.059	.000	.000	.000	.000	.000
CIHU4	.139	.107	.000	.000	.000	1.000	.000	.000	.000	.000	.000	.065	.023	.116	.078	.058	.000	.000	.000	.000	.000
CIHR5	.186	.133	.000	.000	.000	.000	1.000	.000	.000	.000	.000	.083	.029	.154	.101	.074	.000	.000	.000	.000	.000
CIHR6	.085	.131	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.069	.022	.080	.069	.057	.000	.000	.000	.000	.000
C1HR7	.062	.141	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.070	.022	.065	.064	.057	.000	.000	.000	.000	.000
CIHR8	.030	.132	.000	.000	.000	.000	.000	.000	.000	1.000	.000	.062	.018	.040	.051	.049	.000	.000	.000	.000	.000
CIFI9	.000	.189	.000	.000	.000	.000	.000	.000	.000	.000	1.000	.083	.023	.026	.060	.063	.000	.000	.000	.000	.000
PAAGI	.000	.000	.416	.336	.272	.152	.443	.329	.253	.123	.000	1.135	.148	.009	.000	.012	.964	.000	.000	.000	.000
PAIN2	.000	.000	.409	.335	.281	.166	.419	.308	.244	.121	.000	.076	1.246	.019	.173	.173	000	.731	.000	.000	.000
PAED3	.000	.000	.007	.009	.010	.013	.004	.004	.004	.002	.000	.000	.0001	.002	.000	.000	.000	.000	1.000	.000	.000
PAHE4	.000	.000	.009	.008	.007	.003	.009	.007	.006	.003	.000	.000	.000	.000	1.019	.000	.000	.000	.000	.986	.000
PAOT5	.000	.000	.289	.264	.243	.232	.230	.189	.169	.107	.000	.152	.215	.051	.073	1.155	.000	.000	.000	.000	.971
DDAGI	.332	.257	.432	.349	.282	.157	.459	.341	.262	.128	.000	.140	.153	.009	.000	.0121	.135	.112	.009	.000	.012
DDEN2	.431	.332	.560	.458	.384	.227	.573	.422	.334	.166	.000	.105	.337	.027	.236	.236	.101	1.246	.027	.233	.230
DDED3	.008	.005	.007	.009	.010	.013	.004	.004	.004	.002	.000	.000	.000	.002	.000	.000	.000	.000	1.002	.000	.000
DDHE4	.007	.006	.009	.008	.007	.003	.010	.007	.007	.003	.000	.000	.000	.000	.020	.000	.000	.000	.000	1.019	.000
DDOT5	.244	.186	.298	.272	.250	.239	.237	.195	.174	.110	.000	.156	**.221**	.052	.075	.159	.151	.162	.052	.074	1.155

Appendix Table 8

Matrix - $M_{a3} = (I - A_j)^{-1}$, Cross Effects

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAG1	PAIN2	PAED3	PAHE4	PAOT5	DDAG1	DDIN2	DDED3	DDHE4	DDOT5
FPLA1	1.116	.090	.241	.207	.178	.131	.232	.178	.145	.077	.000	.132	.144	.111	.115	.114	.131	.081	.170	.141	.120
FPKA2	.278	1.214	.589	.496	.421	.293	.578	.439	.353	.187	.000	.323	.345	.260	.257	.261	.314	.193	.409	.338	.287
CIHU1	.032	.024	1.043	.036	.031	.021	.042	.032	.026	.013	.000	.039	.032	.049	.041	.036	.071	.032	.152	.094	.067
CIHVI2	.041	.032	.056	1.047	.040	.027	.055	.042	.033	.017	.000	.051	.041	.064	.054	.046	.093	.042	.181	.117	.086
CIHU3	.044	.034	.059	.050	1.042	.029	.058	.044	.035	.019	.000	.054	.044	.068	.057	.049	.100	.044	.176	.120	.091
CIHU4	.043	.033	.059	.049	.042	1.028	.058	.044	.035	.018	.000	.054	.044	.067	.056	.049	.100	.043	.158	.114	.090
CIHR5	.055	.043	.075	.063	.053	.036	1.074	.056	.045	.023	.000	.068	.056	.086	.072	.062	.128	.055	.208	.148	.115
CIHR6	.044	.034	.059	.050	.042	.029	.059	1.044	.036	.019	.000	.054	.044	.068	.057	.049	.105	.043	.123	.105	.090
C1HR7	.044	.034	.059	.050	.042	.029	.059	.044	1.036	.019	.000	.054	.044	.068	.057	.049	.106	.043	.108	.101	.089
CIHR8	.038	.029	.051	.043	.036	.025	.051	.038	.031	1.016	.000	.047	.038	.059	.050	.043	.093	.037	.077	.083	.077
CIF19	.050	.038	.067	.056	.048	J032	.066	.050	.040	.021	1.000	.061	.050	.077	.065	.056	.124	.048	.074	.101	.099
PAAG1	.517	J99	.342	.289	.246	.172	.335	.254	.205	.108	.000	1.234	.222	.242	.220	.204	.327	.237	.250	.205	.190
PAIN2	.577	.444	.437	.368	.314	.220	.427	.324	.261	.138	.000	.3121	.291	.335	.302	.277	.331	.350	.329	.435	.400
PAED3	.010	.007	.005	.004	.004	.003	.005	.004	.003	.002	.000	.003	.003	1.002	.002	.002	.003	.002	.005	.003	.003
PAHE4	.010	.008	.005	.004	.004	.003	.005	.004	.003	.002	.000	.003	.003	.002	1.002	.002	.003	.002	.004	.022	.003
PAOT5	.476	.364	.383	.323	.275	.192	.375	.285	.230	.121	.000	.287	.260	.319	.283	1.256	.376	.311	.323	.307	.357
DDAG1	.279	.214	.347	.289	.244	.161	.347	.261	.208	.107	.000	.355	.266	.468	.378	.317	1.234	.168	.251	.225	.205
DDIN2	.469	.361	.635	.535	.457	.318	.620	.469	.380	.201	.000	.568	.480	.705	.609	.534	.411	1.291	.458	.407	.368
DDED3	.004	.003	.003	.003	.002	.002	.003	.002	.002	.001	.000	.006	.003	.009	.006	.005	.003	.002	1.002	.002	.002
DDHE4	.004	.003	.003	.003	.002	.002	.003	.002	.002	.001	.000	.006	.003	.008	.007	.005	.003	.002	.003	1.002	.002
DDOT5	.310	.238	.461	.387	.329	.227	.453	.342	.276	.145	.000	.373	.328	.441	.384	.342	.285	.196	.329	.288	1.256

Appendix Table 9

Transfer Multiplier Effects - T = Mal-I

	FPLA1	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIF19	PAAGI	PABM2	PAED3	PAHE4	PAOT5	DDAGI	DDIN2	DDED3	DDHE4	DDOT5	TOTAL
FPLA1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
FPKA2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
CIHU1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.005
CIHU2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.026	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.026
CIHU3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.039	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.039
CIHU4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.090	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.090
CIHR5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.021	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.021
CIHR6	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.033	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.033
CIHR7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.047	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000	.047
CIHR8	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.108	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.108
CIFI9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAAGI	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAEV2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAED3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAHE4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
PAOT5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDAGI	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDIN2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDED3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDHE4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
DDOT5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
TOTAL	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.369	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.369

Appendix Table 11

Closed Loop Multiplier Effects - C = (M - I)*Ma2*Mal

	FPLAl	FPKA2	CIHU1	CIHU2	CIHU3	CIHU4	CIHR5	CIHR6	CIHR7	CIHR8	CIFI9	PAAG1	PAEV2	PAED3	PAHE4	PAOT5	DDAG1	DDIN2	DDED3	DDHE4	DDOT5	TOTAL
FPLAl	.418	.321	.530	.449	.385	.274	.516	.392	.317	.168	.111	.367	.348	.388	.354	.326	.354	.254	.388	.350	.317	7.326
FPKA2	.003	.771	1.279	1.075	.914	.632	1.256	.952	.766	.404	.264	.887	.830	.925	.830	.767	.855	.607	.925	.818	.744	17.505
CIHU1	.121	.093	.154	.130	.111	.078	.151	.114	.092	.049	.032	.107	.101	.112	.102	.094	.146	.086	.233	.166	.133	2.404
CIHU2	.157	.121	.200	.169	.144	.101	.196	.148	.120	.063	.042	.139	.130	.145	.132	.121	.191	.112	.286	.211	.172	3.099
CIHL3	.167	.128	.212	.179	.153	.107	.208	.158	.127	.067	.044	.147	.138	.154	.139	.129	.204	.118	.287	.219	.182	3.266
CIHU4	.165	.127	.210	.177	.151	.105	.206	.156	.126	.066	.044	.146	.137	.153	.138	.127	.203	.117	.269	.213	.179	3.214
C1HR5	.211	.162	.269	.227	.193	.135	.263	.200	.161	.085	.056	.186	.175	.195	.176	.163	.259	.149	.349	.274	.230	4.117
C1HR6	.167	.129	.213	.180	.153	.106	.209	.159	.128	.067	.044	.148	.139	.154	.139	.128	.209	.117	.235	.205	.180	3.209
CIHR7	.168	.129	.214	.180	.153	.106	.210	.159	.128	.068	.044	.148	.139	.155	.139	.129	.211	.118	.220	.201	.180	3.199
CIHR8	.145	.111	.185	.155	.132	.092	.181	.137	.111	.058	.038	.128	.120	.134	.120	.111	.183	.101	.174	.169	.155	2.741
C1FI9	.189	.146	.241	.203	.173	.119	.237	.180	.145	.076	.050	.167	.157	.175	.157	.145	.242	.132	.200	.213	.201	3.547
PAAG1	1.046	.807	.928	.778	.661	.451	.916	.692	.556	.291	.191	.782	.655	.935	.793	.694	.883	.587	.943	.782	.685	15.055
PAIN2	1.284	.987	1.235	1.040	.887	.618	1.208	.915	.739	.390	.256	.993	.875	1.159	1.015	.906	1.031	.819	1.179	1.172	1.047	19.771
PAED3	.017	.012	.012	.010	.008	.006	.011	.009	.007	.004	.002	.011	.008	.015	.012	.010	.011	.006	.016	.012	.010	.209
PAHE4	.016	.013	.012	.010	.008	.006	.011	.009	.007	.004	.002	.011	.009	.015	.012	.010	.011	.006	.015	.031	.010	.228
PAOT5	1.127	.865	1.136	.955	.814	.563	1.114	.844	.680	.358	.235	.888	.789	1.019	.893	.801	1.002	.734	1.070	.953	.927	17.767
DDAG1	.753	.580	.962	.807	.685	.468	.950	.718	.577	.302	.198	.811	.680	.970	.823	.720	.782	.497	.970	.812	.699	14.761
DD1N2	1.325	1.019	1.690	1.423	1.214	.845	1.652	1.253	1.011	.534	.350	1.359	1.197	1.586	1.389	1.239	1.310	.875	1.586	1.371	1.204	25.433
DDE03	.009	.007	.012	.010	.008	.006	.011	.009	.007	.004	.002	.011	.009	.015	.012	.010	.011	.006	.015	.012	.010	.194
DDHE4	.009	.007	.012	.010	.009	.006	.012	.009	.007	.004	.002	.012	.009	.015	.012	.010	.011	.006	.015	.012	.010	.198
DDOT5	.917	.705	1.170	.984	.838	.580	1.147	.869	.700	.369	.242	.914	.813	1.050	.920	.824	.881	.594	1.050	.908	.801	17.274
TOTAL	9.414	7.240	10.874	9.151	7.794	5.402	10.664	8.082	6.511	3.431	2.248	8.364	7.457	9.466	8.307	7.462	8.990	6.041	10.423	9.103	8.075	164.502

Appendix Table 13

Multiplier Effects by Type of Account

	Subtotal Columns of Matrix MA (Backward Linkages)				
	Total	FP	Cl	PA	DD
FPLA1	12.436	2.420	2.490	3.490	4.036
FPKA2	10.095	2.092	2.215	2.684	3.104
CIHU1	14.310	1.809	2.898	4.452	5.151
CIHU2	12.199	1.525	2.599	3.745	4.330
CIHU3	10.540	1.299	2.363	3.191	3.687
CIHU4	7.607	.906	1.950	2.208	2.543
CIHR5	14.053	1.772	2.859	4.366	5.056
CIHR6	10.890	1.345	2.411	3.307	3.827
CIHR7	8.969	1.084	2.137	2.665	3.083
CIHR8	5.199	.572	1.600	1.404	1.622
CIF19	4.119	.375	1.762	.920	1.063
PAAG1	11.297	1.824	1.916	4.048	3.508
PAIN2	10.169	1.370	1.436	3.945	3.418
PAED3	12.379	2.178	2.252	4.223	3.725
PAHE4	11.193	1.818	1.897	3.991	3.487
PAOT5	10.215	1.584	1.660	3.759	3.212
DDAG1	11.889	1.758	1.847	3.902	4.381
DDIN2	8.432	1.001	1.049	2.883	3.498
DDED3	13.379	2.178	2.252	4.223	4.725
DDHE4	12.042	1.793	1.872	3.937	4.440
DDOT5	10.920	1.538	1.612	3.650	4.119
TOTAL	222.332	32.240	43.081	70.996	76.016

Appendix Table 14

Multiplier Effects by Type of Account

	Subtotal Columns Of Matrix MA (Forward Linkages)				
	Total	FP	Cl	PA	DD
FPLA1	11.099	1.739	3.143	3.185	3.032
FPKA2	21.141	2.774	7.543	5.588	5.236
CIHU1	3.914	.425	1.916	.808	.764
CIHU2	4.746	.538	2.208	1.028	.972
CIHU3	4.930	.557	2.293	1.070	1.010
CIHL4	4.889	.538	2.332	1.039	.980
CIHR5	5.898	.692	2.609	1.336	1.261
CIHR6	4.755	.512	2.291	1.005	.946
C1HR7	4.728	.501	2.310	.989	.929
CIHR8	4.231	.418	2.198	.833	.782
C1FI9	4.991	.524	2.424	1.055	.988
PAAG1	19.726	1.853	7.867	5.161	4.845
PAIN2	24.537	2.271	9.650	6.636	5.979
PAED3	2.267	.029	.124	1.058	1.055
PAHE4	2.289	.029	.124	1.076	1.059
PAOT5	22.177	1.992	8.492	6.035	5.658
DDAG1	19.427	1.922	8.162	4.317	5.026
DDIN2	32.206	3.107	13.205	7.712	8.182
DDED3	1.267	.029	.124	.058	1.055
CDHE4	1.307	.030	.126	.077	1.074
DDOT5	21.809	2.051	8.745	5.185	5.826
TOTAL	222.332	22.532	87.886	55.253	56.6

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ABSTRACT

This report compiles a latest social accounting matrix (SAM) of Pakistan for the year 1989-90. The SAM framework provides useful information about the structure of Pakistan's economy. Within this framework, the preferred classifications of various accounts are undertaken according to the policy objectives and later model building. The SAM presents four types of accounts: factors account, institutions account, production account, and capital account. These accounts are disaggregated on the basis of requirements and availability of data. Factors of production account is disaggregated into labour and capital accounts. Institutions accounts consist of households, firms, government, and rest of the world. Households account is further disaggregated by four income categories for rural and urban areas. Production account is disaggregated into agriculture, industry, education, health and other sectors. Further disaggregation of production account is also made on the basis of goods for domestic market and for export market. Finally, it presents consolidated capital account.

This study also aims to undertake a multiplier analysis, which provides backward and forward linkages in production, consumption, distribution and accumulation accounts of the economy. The multipliers for all endogenous accounts imply a high degree of integration of the accounts. For the production sectors, backward linkages are strongest for the education, followed by agriculture, health, other sectors and industry. The largest forward linkage multipliers are found for industry, followed by other sectors, agriculture, health, and education. Regarding the households income groups, the largest backward linkage is found for the urban poorest and smallest for the rural rich. While the largest forward linkage is for the rural poorest and smallest for the urban poorest.

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