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Distributional Impact of Structural Adjustment on Income Inequality in Pakistan: A SAM-based Analysis

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1. Introduction

Domestic poverty and income inequality are closely related to the state of the economy, which is linked with internal and external economic policies. Since 1988, under the rubric of structural adjustment program (SAP), Pakistan has made use of fiscal, monetary and trade policies to correct her macro economic imbalances. It is hard to substantiate with proof that these programs protect the poor. A number of studies have found that income inequality has been getting worse during the adjustment period in Pakistan.[1] For example, Kemal (1994), Khattak and Jaffery (1995) and Anwar (1996) found that SAP accompanied with rising income inequality and poverty in Pakistan. But these studies are restricted as they did not employ an adequate methodology to assess the impact of structural adjustment reforms on income inequality.[2] This paper, however, uses a simple static fixed-price SAM-based framework to analyze distributional outcome of incomes for rural and urban households. This methodology is useful because social accounting matrix (SAM) represents the whole economy and it does not need a large data set.

In particular, this study intends to analyze the impact of fiscal policy relating to subsidies (production and consumption subsidies), government current expenditure and expenditure on health and education on incomes of various urban and rural households in Pakistan. It attempts to seek an appropriate answer of the main research question: *whether or not adjustment polices have had adverse effects on income inequality in Pakistan.*

The plan of the paper is as follows. Following introduction, section 2 presents historical overview of adjustment policies and income distribution in Pakistan. Section 3 describes methodology and data. Results are discussed in section 4. Final section gives conclusion.

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[1] For other developing countries opting for SAP, see Khan (1993), who concluded that out of 55 countries only seven succeeded to achieve positive impact on income distribution.

[2] White (1995) and McGillivary *et. al* (1994)) argued that performing counter factual analysis using econometric or general equilibrium models is the most legitimate approach to examining the relationship between poverty and economic reforms.

2. Historical Overview of Adjustment Policies and Income Distribution

Fiscal performance of Pakistan deteriorated significantly up to financial year 1987-88. Budget deficit reached to 8.5% of GDP in 1987-88. A large portion of government expenditure was utilized for subsidy provision as consumer subsidies were supposed to help the poor and production subsidies to provide assisstance in production process and for exports. At the same time, there have been many tax exemptions. Pakistan, therefore, was needed tax reforms with efficiency and equity objectives as well as to reduce budget deficit by revenue generation accompanied with reduction in current expenditure in order to free resources for development expenditure. In the first extensive adjustment program embarked on July 1988, a number of recommendations were made by the IMF and the World Bank [3] It was recommended that tax revenue should be increased from 13.0% of GDP in 1986-87 to 16.9% of GDP in 1992-93 with an increase in direct tax revenue from 1.9% of GDP to 3.3% of GDP and indirect tax revenue from 11.2 % of GDP to 13.6% of GDP. At the same time, it was emphasized a gradual reduction in government total expenditure from 26.7 % of GDP in 1987-88 to 24.8 % of GDP in 1990-91 by reducing current expenditure with main emphasis on lowering subsidies from 1.7% of GDP to 0.5% of GDP. Therefore, since 1988 the government has been making strenuous efforts to reverse the inherited trend in fiscal balance by broadening the tax base, abolishing tax exemptions and tax holidays and increasing the elasticity of tax system by shifting the emphasis from imports to domestic consumption. Initially, consumption subsidies were incurred to provide safeguard to poor against rising prices of essentials, such as wheat, edible oils while production subsidies were aimed to promote economic activities in areas with long run interest of the nation. But under the deregulation plan and to move towards more market oriented economy, subsidies are substantially withdrawn from 1.7% of GDP in 1988-89 to 0.5% of GDP in 1997-98 as reported in Table 1. Current and development expenditures are also declined, respectively, from 19.8% to 18.8% of GDP and from 6.9% to 3.1% of GDP. Fiscal deficit has declined from 8.5% of GDP in 1987-88 to 5.4% of GDP during 1997-98. Table 1 also shows that

[3] For more detail, see World Bank (1988), Pakistan Growth Through Adjustment.

Table 1: Key Indicators of Fiscal Policy in Pakistan (% of GDP)

		Government Expenditure				
Year	Tax Revenue	Total	Subsidies	Health[1]	Education[1]	Budget Deficit
1987-88	13.8	26.7	1.50	1.0	2.4	8.5
1988-89	14.3	26.1	1.66	1.0	2.4	7.4
1989-90	14.0	25.7	1.47	1.0	2.2	6.5
1990-91	12.7	25.6	1.10	0.9	2.1	8.7
1991-92	13.6	26.5	0.94	0.7	2.2	7.4
1992-93	13.3	26.0	0.73	0.7	2.2	8.0
1993-94	13.2	23.2	0.58	0.7	2.2	5.9
1994-95	13.7	22.8	0.35	0.6	2.4	5.6
1995-96	14.1	23.9	0.64	0.8	2.4	6.3
1996-97	13.5	22.3	0.54	0.8	2.6	6.2
1997-98	12.9	21.1	0.48	0.7	2.3	5.4

Source: Pakistan Economic Surveys (various issues).
[1]Expenditure on health and education are as percentage of GNP.

public expenditure on education and health are declined, although SAP directed to increase expenditure on education and health. Though, the fiscal adjustment programs emphasize resource mobilization and low income groups are supposed to be protected, recent studies show that income inequality has increased during the period of adjustment in Pakistan. Historical trend in income distribution indicated by gini-coefficients along with GDP growth rates are presented in Table 2. It shows that the country has been growing satisfactorily, but income distribution has worsened over the period 1988 to 1994. Gini coefficients for Pakistan as a whole and for rural and urban areas reported in Table 2 show that gini-coefficients increased for Pakistan from 0.35 in 1987-88 to 0.40 in 1993-94, for rural areas from 0.31 to 0.35 and for urban areas from 0.37 to 0.40 for the same years. Table 2 also shows that on the whole, income distribution during the period under consideration is more worse in urban area as compared to in rural area except in 1990-91. It seems that benefits of growth did not trickle down to the poor. However, these results

have provoked us to conduct a study on income distribution to determine the possible causes of this outcome.

Table 2 Trends of Gini Coefficients and Growth Rates of GDP

Years	Gini Coefficients			Growth rate of GDP (%)
	Pakistan	Rural	Urban	
1987-88	0.35	0.31	0.37	6.44
1990-91	0.41	0.41	0.39	5.57
1992-93	0.41	0.37	0.42	2.27
1993-94	0.40	0.35	0.40	4.54

Source: Pakistan Economic Survey, 1997-98.

3. Methodology and Data

This section briefly describes salient features of a social accounting matrix used for the analysis.[4] After this, it explains a simple static fixed-price SAM-based model, which is used to analyse the impact of selected fiscal policies under structural adjustment on households incomes.

3.1 Structure of a Social Accounting Matrix

Interest in the social accounting matrix has mainly occurred in the last three decades, when it was extensively used as a tool for policy analysis. 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. The SAM framework is also 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) provided a comprehensive survey on SAM-based CGE modelling. The classification and disaggregation of accounts in a social accounting

[4] For further details on Social Accounting Matrix, 1989-90, see Siddiqui and Iqbal (1999).

matrix can take various forms, depending on how the constituent accounts are defined and depending on one's analytical interests and specific policy concerns.

The compilation of a comprehensive input-output (I-O) table started in Pakistan in 1975-76 and the first detailed I-O table was produced in 1983 and the 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) compiled a social accounting matrix for the year 1984-85, using I-O table and Institutional Sector Accounts for the same year. The FBS continued its endeavours and produced the second I-O table for the year 1989-90. The information presented in I-O table 1989-90 includes supply and use tables and the industry by industry flow table. The I-O table 1996 provides an elaboration of 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 I-O table for 1989-90.[5] 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 I-O table and IEA for 1989-90.[6]

Since the FBS did not produce the social accounting matrix for the year 1989-90, we attempt to compile a social accounting matrix for 1989-90, using input-output table and integrated economic accounts for the same year. It yields a 28 x 28 social accounting matrix of Pakistan.[7] A Social Accounting Matrix for the year 1989-90 reported in Appendix 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

[5] Institutional Sector Accounts for 1984-85 and Integrated Economic Accounts for 1989-90 have almost similar characteristics.

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

[7] Since the compilation of a SAM is quite flexible, it has been condensed according to our own choice and specific policy objectives.

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. 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 m goods for domestic market and for export market. Finally, it presents consolidated capital account. Since our analysis mainly focus on the households sector, the following sub section describes the disaggregation of the households by income groups and their sources and uses of income in a more detail.

3.2 Sources and Uses of Incomes of Households

Sources of income of households

Table 3 shows the sources of incomes of various urban and rural income groups during the year 1989-90. These estimates are derived from Appendix Table 1 of social accounting matrix for 1989-90. 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. Starting from urban households, Table 3 indicates that wages and salaries contribute the highest share of 54.2% in the total income of the urban lowest income group while the remaining sources of income of this group are operating surplus (42.2%), dividends from firms (1.1%), transfers from the government (1.1%) and transfers from the rest of the world (1.3%). Similarly, for the second urban low income group, wages and salaries contributes 46.7%, operating surplus 44.7%, dividends from firms 4.3%, transfers from the government 0.56%, and transfers from the rest of the

world 3.7% in its total income. As contrast to the earlier two urban income groups, the middle and high income groups, respectively, receive largest shares from operating surplus 46.7% and 40.1%. While the remaining sources of incomes of both the middle and high income groups are, correspondingly, wages and salaries 38.8% and 28.5%, dividends from firms 5.8% and 11.6%, transfers from the government 1.0% and 2.1%, and transfers from the rest of the world 7.7% and 17.7% of their total incomes.

Regarding the rural households, operating surplus contributes the largest shares in incomes of all the four categories of rural income groups, i.e. 56.6%, 68.3%, 72.0% and 61.5% in incomes of the lowest, low, middle and high income groups, respectively. While the other sources of incomes of all the four rural income groups are, correspondingly, wages and salaries 37.4%, 21.3%, 15.5%, and 7.6%; dividends from firms 2.6%, 5.2%, 7.4%, and 17.1%; transfers from the government 0.75%, 0.5%, 0.31%, and 4.3%; and transfers from the rest of the world are 2.7%, 4.7%, 4.8% and 9.6%.

Uses of income by Rural and Urban Households

The respective columns of the social accounting matrix reported in Appendix Table 1 give uses of income by the various rural and urban income groups, which are same as defined earlier in the case of sources of incomes. The uses of incomes are summarised in in Table 4. It shows that total uses of income are equal to total sources of income of respective income groups. Starting from urban households, Table 4 shows that of the total uses of income, the largest share is spent on manufactured products by all the four urban income groups such as 56.0% by the lowest income group, 45.8% by the low income group, 38.4% by the middle income group and 22.7% by the highest income

Table 3 Sources of Households Income by Income Groups, 1989-90 (percentage shares)

	Urban (HU1) (rupees) (upto-2500)	Urban (HU2) (rupees) (2501-4000)	Urban (HU3) (rupees) (4001-7000)	Urban (HU4) (rupees) (7001&above)	Rural (HR1) (rupees) (upto-2500)	Rural (HR2) (rupees) (2501-4000)	Rural (HR3) (rupees) (4001-7000)	Rural (HU4) (rupees) (7001&above)
Wages & Salaries	54.24	46.73	38.80	28.49	37.35	21.30	15.50	7.58
Operating Surplus	42.21	44.69	46.65	40.11	56.59	68.30	72.03	61.45
Dividends from Firms	1.14	4.27	5.81	11.58	2.61	5.16	7.41	17.11
Transfers from Govt.	1.14	0.56	1.00	2.14	0.75	0.50	0.31	4.28
Transfers from ROW	1.28	3.74	7.74	17.68	2.70	4.73	4.75	9.59
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

group. The second largest expenditure component is on agricultural product where the lowest income group spends 43.2%, low income group 34.9%, middle income group 28.2% and high income group 15.7% of their total incomes. On other activities (including services), lowest income group spends 29.8%, low income group, 27.2%, middle income group 25.0% and high income group 23.9% of their incomes. Table 4 also shows that all these groups spend a small share i.e. less than 2% of their incomes on both education and health. It is interesting to note that all the urban income groups pay less than 1% of their incomes as a direct taxes to the government. It is also evident from Table 4 that both urban lowest and low income groups are net dissavers (i.e. -30.8% and -10.0% of their income, respectively) while the other two groups middle and high income groups save, respectively, 6.0% and 35.4% of their total incomes.

Regarding rural households, Table 4 shows different uses of incomes by the lowest, low, middle and high income groups in Pakistan. As similar to urban households, it shows that all rural income groups spend largest proprotion of their incomes (i.e. 57.3%, 42.2%, 33.4%, and 16.6%, respectively) on manufactured goods. While the second largest consumption component is agricultural product on which they spend, correspondingly, 45.9%, 34.1%, 26.2%, and 12.8% of their total incomes. The expenditure on other commodities (including services) remains 23.7%, 19.5%, 17.4%, and 11.0%, respectively. As similar to urban income groups, the rural income groups also spend a small proportion of their income on health and education which is even lesser than spending by the urban groups. The rural income groups also pay a small amount of their incomes (i.e. less than 1% except highest income group which pays 1.3%) as direct taxes to the government. Table 4 shows that the rural lowest income group is a net dissaver of 28.6% of its income while the other groups are the savers as the low income group saves 2.9%, middle income group 21.7%, and high rural income 57.7% of their total incomes in 1989-90.

Table 4 Uses of Households Income by Income Groups, 1989-90 (percentage shares)

	Urban (HU1) (rupees) (upto-2500)	Urban (HU2) (rupees) (2501-4000)	Urban (HU3) (rupees) (4001-7000)	Urban (HU4) (rupees) (7001&above)	Rural (HR1) (rupees) (upto-2500)	Rural (HR2) (rupees) (2501-4000)	Rural (HR3) (rupees) (4001-7000)	Rural (HU4) (rupees) (7001&above)
Agriculture Product	43.19	34.90	28.20	15.73	45.94	34.14	26.21	12.78
Manufacturing Product	55.97	45.77	38.41	22.67	57.29	42.18	33.43	16.62
Education	0.68	0.93	0.96	1.33	0.39	0.44	0.40	0.25
Health	0.93	0.76	0.72	0.32	0.96	0.71	0.65	0.33
Others	29.79	27.23	25.03	23.88	23.73	19.51	17.41	11.03
Taxes Paid	0.21	0.41	0.72	0.63	0.24	0.15	0.24	1.30
Savings	-30.77	-10.02	5.96	35.43	-28.57	2.87	21.65	57.68
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

3.3 A SAM-Based Model

A static fixed-price SAM-based model is used to calculate the impact multipliers of socio-economic linkages using the social accounting matrix for the year 1989-90 reported in Appendix Table 1. This simple model provides multipliers in a general equilibrium framework. The multipliers can be further decomposed in order to derive the direct and indirect effects and the main causal linkages underlying the structure of the economy. Pyatt and Round (1985) provided a comprehensive measure of multiplier analysis, which is also used here. The multiplier model includes Leontief input-output multipliers and the impact of exogenous shocks on income generation, distribution and consumption. The procedure of the multiplier analysis is as follows. In a SAM-based analysis, it is a common practice to take government accounts, capital accounts, and the rest of the world accounts as exogenous, on the assumption that they are externally determined. Thus, exogenous accounts are taken into vector x and total incomes of the endogenous accounts as vector y, while the transactions of the endogenous accounts relative to total income are taken as matrix A. All these lead to the following equation:

$$y = Ay + x = (I - A)^{-1}. x = M_a . x \qquad (1)$$

The aggregate multiplier (M_a) in equation (1) can be further decomposed into three matrices M_1, M_2, and M_3 in order to derive direct and indirect effects. M_1 captures the effects of one group on itself through direct transfers. M_2 captures the cross-effects of the multipliers process whereby an injection into one part of the system has repercussions on other parts. Matrix M_3 shows the full circular effects of an income injection going round the system and back to its point of origin in a series of repeated and dampening cycles. The mathematical expression is as follows:

$$y = (M_3.M_2.M_1) . x \qquad (2)$$

Pyatt and Round respecify equation (2) as:

$$y = (I + T + O + C) . x \qquad (3)$$

where

I = initial impulse or identity multiplier (unit increase)

T = (M_1 - I) named as transfer multiplier

O = (M_2 - I). M_1 named as open-loop multiplier

C = (M_3 - I) . M_2 . M_1 named as closed -loop multiplier

In this study, using equation (3), we undertake the multiplier analysis and simulate some exogenous changes relating to fiscal policy in Pakistan. The simulation results will provide the direct and indirect effects of exogenous shocks on income distribution of aforementioned various urban and rural income groups.

4. Results and Discussion

The results of selected adjustment polices on households incomes and income distribution represented by gini-coefficients are described in the following sub-sections.

4.1 Impact of Adjustment Polices on Households Incomes

Using the SAM-based model, the aggregate multipliers (M_a) and its decomposition into initial impulse (I), transfer multiplier (T), open-loop multiplier (O), and closed-loop multiplier (C) are calculated and are reported in Appendix Table 2. It shows that values in column (M_a) give the 'backward' linkages of the endogenous accounts, which indicate the measure of the opportunities offered to suppliers arising from marginal changes in final demand (i.e. exogenous accounts). The vector of the sum of rows gives the 'forward' linkages or the effect of changes in supply on output of using sectors. 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, which give the total effect on each account of a unit change in all endogenous accounts, are found for industry, followed by other sectors, agriculture,

Table 5 Simulation Results by Changes in Exogenous Accounts

(percentage changes in incomes)

Endogenous Accounts	50% reduction in consumption subsidies (1)	50% reduction in production subsidies (2)	50% reduction in overall subsidies (3)	5% reduction in government overall current expenditure (4)	10 % reduction in government expenditure on education and health (5)	Total effect of all three policies (3+4+5) (6)
Labour (wages)	-0.66	-0.88	-1.54	-1.87	-0.89	-4.18
Capital (op. surp.)	-0.72	-0.92	-1.64	-1.70	-0.43	-3.67
HU1 (urban)	-1.23	-0.87	-2.11	-1.82	-0.67	-4.46
HU2 (urban)	-0.93	-0.85	-1.78	-1.79	-0.62	-4.06
HU3 (urban)	-1.12	-0.81	-1.92	-1.74	-0.56	-4.10
HU4 (urban)	-1.60	-0.69	-2.29	-1.65	-0.46	-4.27
HR1 (rural)	-1.04	-0.86	-1.91	-1.78	-0.58	-4.14
HR2 (rural)	-0.90	-0.85	-1.75	-1.73	-0.50	-3.87
HR3 (rural)	-0.81	-0.84	-1.65	-1.74	-0.47	-3.76
HR4 (rural)	-2.71	-0.73	-3.45	-1.89	-0.38	-5.53
Firms	-0.47	-0.60	-1.07	-2.84	-0.28	-4.13
Pro. Agriculture	-0.94	-0.88	-1.82	-1.57	-0.47	-3.74
Pro. Industry	-0.62	-1.03	-1.64	-1.23	-0.32	-3.10
Pro. Education	-0.32	-0.21	-0.53	-4.16	-7.57	-11.85
Pro. Health	-0.60	-0.43	-1.03	-3.30	-5.06	-9.08
Pro. Other Sector	-0.60	-0.92	-1.52	-1.94	-0.30	-3.67
Dem. Agriculture	-0.95	-0.89	-1.84	-1.59	-0.47	-3.79
Dem. Industry	-0.73	-0.80	-1.54	-1.42	-0.38	-3.24
Dem. Education	-0.32	-0.20	-0.52	-4.16	-7.57	-11.85
Dem. Health	-0.60	-0.43	-1.03	-3.31	-5.06	-9.09
Dem. Other Sector	-0.62	-0.67	-1.29	-2.00	-0.31	-3.52

health, and education. Regarding the households income groups, the largest backward linkage is 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).[8]

For the present analysis, we focus on Table 5, which is a summary Table of Appendix Tables 3 to 7. Table 5 gives the simulation results of changes in various exogenous accounts on all households income groups along with other endogenous accounts. Here, the simple simulation exercise assesses the nature of socio-economic linkages in Pakistan's economy. Table 5 summarises the results of the simulations of various exogenous injections relating to selected structural adjustment reforms in Pakistan. The simulation results are briefly explained as follows:[9]

50 percent reduction in subsidies: In almost all the structural and sectoral adjustment programs, the much emphasis has been placed on reduction in subsidies. As indicated earlier in Table 1, since the embarkation of SAP, subsidies have been significantly reduced from Rs.7.3 billion in 1988-89 (1.7% of GDP) to Rs.3.2 billion (0.5% of GDP) in 1997-98, showing one of the most significant compliance indicators of structural adjustment programs in Pakistan. Using the simple model described above, the simulations are performed by reducing the overall subsidies as well as consumption and production subsidies separately by 50 percent. The results are reported in Table 5. Starting from reduction in overall subsidies, Table 5 shows that the incomes of richest rural (HR4 having income more than Rs.7000 per month) and richest urban (HU4 having income more than Rs.7000 per month) are the most affected as their incomes declined by 3.5 percent and 2.3 percent, respectively. The second most affected income groups by reducing subsidies are the poorest urban and poorest rural (HU1 and HR1 both having income less than Rs.2500 per month) as their incomes are reduced by 2.1 percent and 1.9 percent, respectively. Reducing consumption and production subsidies separately by 50 percent, production subsidies affects the poorest group the most. The second most affected groups are the poorest urban and poorest rural. These results imply that the richest people in the country are the higher beneficiary of subsidies provided by the government. Regarding the producing sectors, the reduction in overall subsidies has more adverse impact on the agriculture sector, followed by industry, other sectors, health, and education. Table 5 also shows that operating surplus of the capital declines more than the wages of the labour due to a reduction in overall subsidies.

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

(ii) 5 percent reduction in government overall current expenditure: All the World Bank-IMF adjustment programs have emphasized that Pakistan should reduce public current expenditure in order to correct the persistent fiscal imbalances. Public current expenditures were19.8 percent of GDP in 1987-88, which declined to 18.0 percent of GDP in 1997-98. The persistent reduction in current government spending is taken as one of the indicators of the implementation of adjustment reforms in Pakistan. A summary of the main results of a reduction in government current expenditure is presented in Table 5. To standardise the simulations, we have reduced the level of government overall current expenditure by 5 percent below that of the base year 1989-90. The effects of a contraction in government spending appear to be negative on the incomes of all the urban and rural household groups. The largest reduction appears in the income of the richest rural (HR4), followed by poorest urban (HU1), whose incomes are reduced by 1.9 percent and 1.8 percent, respectively. Regarding factors of production, labour income is affected more (1.9 percent reduction) than capital income (1.7 percent decline). For the production sector, reduction in government current spending has more adverse impact on education followed by health, other sectors, agriculture and industry.

(iii) 10 percent reduction in government expenditure on education and health: In the recent adjustment reforms, it has been greatly emphasised to increase investment on education and health in order to enhance human capital in the country. The role of human capital in explaining variation in the rate of growth of output is one that has been given considerable attention in the current literature relating to economic growth in developing countries. Recent economic growth studies have listed human capital as a primary source of economic growth.[10] In spite of this positive phenomenon, government expenditure on education and health has been declining from 3.4% of GDP in 1987-88 to 3.0% of GDP in 1997-98, although the Bank-Fund guided programs emphasised to increase investment on human capital. Table 5 shows that the simulation result of 10 percent decline in public expenditure on education and health reduces activities in the education sector by 7.6 percent and the health sector by 5.1 percent. It also shows that the poorest urban (HU1) and poorest rural (HR1) adversely affected more than the other relatively better-off urban and rural income groups by reducing

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[9] The results should be interpreted with caution because of the assumption of no supply constraints in the system.

[10] Iqbal and Zahid (1998), Barro and Sala-i-Martin (1995), Barro and Lee (1994), Mankiw et al. (1992), Barro (1991, 1989), Romer (1990), Becker et al. (1990), Lucas (1988), and Psacharopoulos (1973) argued that promoting human capital is instrumental in enhancing economic growth.

public expenditure on health and education as the incomes of both the groups decline. Similarly, income of the labour declines relatively more than operating surplus of the capital.

(iv) Simulation result of all three policies: Each adjustment program for Pakistan contains a set of policy variables that need to be implemented simultaneously. Therefore, all the aforementioned policy variables (i.e. 50% reduction in overall subsidies, 5% reduction in overall government current expenditure, and 10% reduction in government expenditure on education and health) are now taken together and the policy simulations are performed collectively. The results of the combinations of the policy reforms are reported in Table 5, which show that all joint policies have considerable negative impact on incomes of all the rural and urban households groups. Among the urban households, the poorest income group affected more than the other income groups as its income is reduced by 4.5%. Among rural households, the richest rural income group is affected more as its income is reduced by 5.5%, followed by the poorest rural income group whose income is declined by 4.1%. Regarding factors of production, labour income is affected negatively more than income of the capital. Among the production sectors, combined adjustment policies have considerable negative impact on education, followed by the health sector as activities in these sectors are declined by 11.9% and 9.1%, respectively.

5. Concluding Remarks and Extension of Work

Structural adjustment reforms advocated by the World Bank and the IMF began in Pakistan in 1988. The Bank-Fund adjustment programs were intended primarily to overcome a variety of macroeconomic distortions as well as a set of deep-rooted structural problems in the economy. After more than a decade of intensive adjustment reforms, still no consensus can be found about the effects they have had on Pakistan's economy. More recently, the important area of research is to analyse the social impact of adjustment reforms, particularly on income distribution and poverty, using an

appropriate quantitative framework. Therefore, this paper attempts to contribute to a more adequate assessment of structural adjustment reforms on income distribution in Pakistan.

In this study, a latest social accounting matrix with disaggregated households sector for the year 1989-90 is used as a tool for structural analysis to provide a quantitative description of the process of production, consumption, distribution, and accumulation. Using a static fixed-price SAM-based model, related simulation exercises are performed to describe the impact of three key structural adjustment policies such as 50% reduction in subsidies, 5% reduction in overall public current spending, and 10% reduction in public spending on education and health (referred as human capital) on incomes of various urban and rural households groups in Pakistan. The main conclusions are as follows. First, the results show that reduction in subsidies has the more adverse impact on the incomes of richest rural and urban households, implying that the richest people in the country are the higher beneficiary of subsidies provided by the government. The second most affected income groups by reducing subsidies are the poorest urban and poorest rural. In particular, consumption subsidies are basically to provide assistance in consumption to the poor but the richest urban and rural groups are benefiting more. Second, the effects of a contraction in government spending appear to be negative on the incomes of all the urban and rural household groups. The largest reduction appears in the income of the richest rural, followed by poorest urban. Third, the simulation results show that decline in public expenditure on education and health discourages activities in the education and health sectors. It also shows that the poorest urban and poorest rural are affected more than the other relatively better-off urban and rural income groups. Finally, the results of the combinations of the policy reforms show that all joint policies have considerable negative impact on incomes of all the rural and urban households groups. Among the urban households, the poorest income group affected more than the other income groups. Among rural households, the richest rural income group is affected more, followed by the poorest rural income group. It is worth noting that because of several restrictive assumptions underlying the multiplier methodology, policy implications derived from the results obtained in the study are limited in nature though a fair idea can be obtained about the impact of changes in exogenous demand, that is, the results show that structural adjustment programs have worse distributional impact on urban and rural households incomes in Pakistan.

Although our analysis has captured some of the main policy variables involved in structural adjustment reforms, it has no means captured all of them. There is thus a need to explore the potential influence of other variables in future research on this topic. However, the present analysis will be extended

by developing a computable general equilibrium (CGE) model for Pakistan's economy in order to analyse all possible structural adjustment polices on poverty and income distribution in Pakistan.

Table 11 Social Accounting Matrix (with disaggregation of households) of Pakistan, 1989-90

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

Table 11 Social Accounting Matrix (with disaggregation of households) of Pakistan, 1989-90

				Total Production				Goods for Domestic Market				Goods for Exports Market				Accumulation	
ulture	Industry	Educatio n	Health	Other Sectors	Agriculture	Industry	Education	Health	Other Sectors	Agriculture	Industry	Health	Other Sectors	Accumulati on	Total
4)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
681	45415	13883	2839	101471											209289
7847	83837	2613	2815	210285											457397
															59822
															79601
															88624
															102228
															104317
															83776
															84113
															83060
															131647
557	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
893	103486	175	0	7826										1458	366736
381	227552	505	2110	149984										96225	777918
0	82	33	0	112										7	19044
2	31	0	176	23										14	9036
832	149439	999	670	101008										65348	626740
															3867
															102210
															9
															22386
65	20785	836	309	49996											163052
7368	675472	19046	8923	634504	366736	777918	19044	9036	926740	3867	102210	9	22386	163052	

Appendix Table 2 Decomposition of Total Multiplier Effects

	SUM COLUMNS OF MATRIX M_a (backward linkages)					SUM ROWS OF MATRIX M_a (forward linkages)				
	Aggregate Multiplier (M_a)	Initial Impulse (I)	Transfer Multiplier (T)	Open-Loop Multiplier (O)	Closed-loop Multiplier (C)	Aggregate Multiplier (M_a)	Initial Impulse (I)	Transfer Multiplier (T)	Open-Loop Multiplier (O)	Closed-loop Multiplier (C)
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	21.141	1.000	.000	2.637	17.505
HU1 (urban)	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 (urban)	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	3.209
HR3 (rural)	8.969	1.000	.000	1.458	6.511	4.728	1.000	.047	.482	3.199
HR4 (rural)	5.199	1.000	.000	.768	3.431	4.231	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	2.289	1.000	.000	1.061	.228
Pro. Oth. Sectors	10.215	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	1.267	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

Appendix Table 3 SIMULATION: CHANGE IN EXOGENOUS ACCOUNT (50% reduction in households subsidies)

	MSAF Total	SUM EXOGENOUS	CALCUL INCOME	NEW EXOGENOUS	SIMUL. INCOME	DECREASE IN INCOME (%)
Labour	209289.	0.	209289.	0.	207913.	- .66
Capital	457397.	0.	457397.	0.	454114.	- .72
HU1 (urban)	59822.	1444.	59822.	1104.	59084.	-1.23
HU2 (urban)	79601.	3425.	79601.	3203.	78863.	- .93
HU3 (urban)	88624.	7744.	88624.	7302.	87635.	-1.12
HU4 (urban)	102228.	20260.	102228.	19165.	100591.	-1.60
HR1 (rural)	104317.	3607.	104317.	3214.	103231.	-1.04
HR2 (rural)	83776.	4381.	83776.	4172.	83018.	- .90
HR3 (rural)	84113.	4256.	84113.	4125.	83432.	- .81
HR4 (rural)	83060.	11518.	83060.	9740.	80807.	-2.71
Firms	131647.	45308.	131647.	45308.	131027.	- .47
Pro. Agriculture	357368.	3867.	357368.	3867.	354000.	- .94
Pro. Industry	675472.	106952.	675472.	106952.	671297.	- .62
Pro. Education	19046.	2.	19046.	2.	18986.	- .32
Pro. Health	8923.	9.	8923.	9.	8870.	- .60
Pro. Oth. Sectors	634504.	25920.	634504.	25920.	630726.	- .60
Dem. Agriculture	366736.	1458.	366736.	1458.	363242.	- .95
Dem. Industry	777918.	96225.	777918.	96225.	772206.	- .73
Dem. Education	19044.	14144.	19044.	14144.	18984.	- .32
Dem. Health	9036.	4245.	9036.	4245.	8982.	- .60
Dem. Oth. Sectors	626740.	167786.	626740.	167786.	622849.	- .62

Appendix Table 4 SIMULATION: CHANGE IN EXOGENOUS ACCOUNT (50% reduction in production subsidies)

	MSAF TOTAL	SUM EXOGENOUS	CALCUL INCOME	NEW EXOGENOUS	CALCUL INCOME	DECREASE IN INCOME (%)
Labour	209289.	0.	209289.	0.	207445.	-.88
Capital	457397.	0.	457397.	0.	453193.	-.92
HU1 (urban)	59822.	1444.	59822.	1444.	59300.	-.87
HU2 (urban)	79601.	3425.	79601.	3425.	78926.	-.85
HU3 (urban)	88624.	7744.	88624.	7744.	87910.	-.81
HU4 (urban)	102228.	20260.	102228.	20260.	101523.	-.69
HR1 (rural)	104317.	3607.	104317.	3607.	103415.	-.86
HR2 (rural)	83776.	4381.	83776.	4381.	83067.	-.85
HR3 (rural)	84113.	4256.	84113.	4256.	83404.	-.84
HR4 (rural)	83060.	11518.	83060.	11518.	82450.	-.73
Firms	131647.	45308.	131647.	45308.	130853.	-.60
Pro. Agriculture	357368.	3867.	357368.	3867.	354217.	-.88
Pro. Industry	675472.	106952.	675472.	104581.	668536.	-1.03
Pro. Education	19046.	2.	19046.	1.	19006.	-.21
Pro. Health	8923.	9.	8923.	9.	8884.	-.43
Pro. Oth. Sectors	634504.	25920.	634504.	24153.	628668.	-.92
Dem Agriculture	366736.	1458.	366736.	1458.	363467.	-.89
Dem Industry	777918.	96225.	777918.	96225.	771672.	-.80
Dem. Education	19044.	14144.	19044.	14144.	19005.	-.20
Dem. Health	9036.	4245.	9036.	4245.	8997.	-.43
Dem. Oth. Sectors	626740.	167786.	626740.	167786.	622549.	-.67

Appendix Table 5 SIMULATION: CHANGE IN EXOGENOUS ACCOUNT (50% reduction in households and production subsidies)

	MSAF TOTAL	SUM EXOGENOUS	CALCUL INCOME	NEW EXOGENOUS	CALCUL INCOME	DECREASE IN INCOME (%)
Labour	209289.	0.	209289.	0.	206069.	-1.54
Capital	457397.	0.	457397.	0.	449909.	-1.64
HU1 (urban)	59822.	1444.	59822.	1104.	58562.	-2.11
HU2 (urban)	79601.	3425.	79601.	3203.	78187.	-1.78
HU3 (urban)	88624.	7744.	88624.	7302.	86921.	-1.92
HU4 (urban)	102228.	20260.	102228.	19165.	99886.	-2.29
HR1 (rural)	104317.	3607.	104317.	3214.	102329.	-1.91
HR2 (rural)	83776.	4381.	83776.	4172.	82309.	-1.75
HR3 (rural)	84113.	4256.	84113.	4125.	82722.	-1.65
HR4 (rural)	83060.	11518.	83060.	9740.	80197.	-3.45
Firms	131647.	45308.	131647.	45308.	130234.	-1.07
Pro. Agriculture	357368.	3867.	357368.	3867.	350849.	-1.82
Pro. Industry	675472.	106952.	675472.	104581.	664362.	-1.64
Pro. Education	19046.	2.	19046.	1.	18946.	- .53
Pro. Health	8923.	9.	8923.	9.	8831.	-1.03
Pro. Oth. Sectors	634504.	25920.	634504.	24153.	624890.	-1.52
Dem. Agriculture	366736.	1458.	366736.	1458.	359973.	-1.84
Dem Industry	777918.	96225.	777918.	96225.	765960.	-1.54
Dem. Education	19044.	14144.	19044.	14144.	18945.	- .52
Dem Health	9036.	4245.	9036.	4245.	8943.	-1.03

Dem. Oth. Sectors	626740.	167786.	626740.	167786.	618659.	-1.29

Appendix Table 6 SIMULATION: CHANGE IN EXOGENOUS ACCOUNT (5% reduction in total government current expenditure)

	MSAF TOTAL	SUM EXOGENOUS	CALCUL INCOME	NEW EXOGENOUS	CALCUL INCOME	DECREASE IN INCOME (%)
Labour	209289.	0.	209289.	0.	205369.	-1.87
Capital	457397.	0.	457397.	0.	449600.	-1.70
HU1 (urban)	59822.	1444.	59822.	1410.	58731.	-1.82
HU2 (urban)	79601.	3425.	79601.	3403.	78179.	-1.79
HU3 (urban)	88624.	7744.	88624.	7700.	87085.	-1.74
HU4 (urban)	102228.	20260.	102228.	20150.	100538.	-1.65
HR1 (rural)	104317.	3607.	104317.	3568.	102465.	-1.78
HR2 (rural)	83776.	4381.	83776.	4360.	82323.	-1.73
HR3 (rural)	84113.	4256.	84113.	4243.	82646.	-1.74
HR4 (rural)	83060.	11518.	83060.	11340.	81491.	-1.89
Firms	131647.	45308.	131647.	43043.	127910.	-2.84
Pro. Agriculture	357368.	3867.	357368.	3867.	351761.	-1.57
Pro. Industry	675472.	106952.	675472.	106715.	667155.	-1.23
Pro. Education	19046.	2.	19046.	2.	18253.	-4.16
Pro. Health	8923.	9.	8923.	9.	8628.	-3.30
Pro. Oth. Sectors	634504.	25920.	634504.	25743.	622172.	-1.94
Dem. Agriculture	366736.	1458.	366736.	1458.	360919.	-1.59
Dem. Industry	777918.	96225.	777918.	96225.	766862.	-1.42
Dem. Education	19044.	14144.	19044.	13437.	18251.	-4.16

Dem. Health	9036.	4245.	9036.	4033.	8737.	-3.31
Dem. Oth. Sectors	626740.	167786.	626740.	162664.	614222.	-2.00

Appendix Table 7 SIMULATION: CHANGE IN EXOGENOUS ACCOUNT (10% reduction in government expenditure on education and health)

	MSAF TOTAL	SUM EXOGENOUS	CALCUL INCOME	NEW EXOGENOUS	CALCUL INCOME	INCREASE IN INCOME (%)
Labour	209289.	0.	209289.	0.	207430.	-.89
Capital	457397.	0.	457397.	0.	455418.	-.43
HU1 (urban)	59822.	1444.	59822.	1444.	59423.	-.67
HU2 (urban)	79601.	3425.	79601.	3425.	79107.	-.62
HU3 (urban)	88624.	7744.	88624.	7744.	88125.	-.56
HU4 (urban)	102228.	20260.	102228.	20260.	101758.	-.46
HR1 (rural)	104317.	3607.	104317.	3607.	103708.	-.58
HR2 (rural)	83776.	4381.	83776.	4381.	83358	-.50
HR3 (rural)	84113.	4256.	84113.	4256.	83717.	-.47
HR4 (rural)	83060.	11518.	83060.	11518.	82743.	-.38
Firms	131647.	45308.	131647.	45308.	131273.	-.28
Pro. Agriculture	357368.	3867.	357368.	3867.	355703.	-.47
Pro. Industry	675472.	106952.	675472.	106952.	673310.	-.32
Pro. Education	19046.	2.	19046.	2.	17604.	-7.57
Pro. Health	8923.	9.	8923.	9.	8472.	-5.06
Pro. Oth. Sectors	634504.	25920.	634504.	25920.	632587.	-.30
Dem. Agriculture	366736.	1458.	366736.	1458.	365009.	-.47
Dem. Industry	777918.	96225.	777918.	96225.	774959.	-.38

Dem. Education	19044.	14144.	19044.	15558.	17602.	-7.57
Dem. Health	9036.	4245.	9036.	4668.	8579.	-5.06
Dem. Oth. Sectors	626740.	167786.	626740.	167786.	624766.	-.31

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