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ALTERNATIVE APPROACH TO ECONOMIC RESTRUCTURING TO BENEFIT THE POOR – SAM MULTIPLIERS ANALYSIS AS ALTERNATIVE APPROACH

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Abstract

Many economic reforms in developing economies are, in fact, price deregulation in the product markets and trade liberalisation, concerning whether the growth of exports accelerates. This paper, however, attempts to offer a new flavour in the policy reforms using fixed price model to study the growth impact of different sectoral investments and transfers to households. We used Social Accounting Matrix (SAM) multipliers to analyse the flow structure and distributional effects of sectoral investments and transfers in a typical developing economy. Using the case of Nepal we simulate the effects of additional demand creations to sectors and transfer earning growth to households and measure their effects and conclude that in the given flow structure, the additional sector demand and transfer growth in the economy benefit the middle income groups more; whereas the benefit to the poorest is only modest. We examine the effects of potential pro-poor economic restructuring measures especially with regard to the improvements of efficiency parameters and redirection of factor endowments. Consequently, poor households transfer towards those activities which have higher multiplier effects of additional demand and transfer earning. Furthermore,

redirection of factor endowments requires undergoing with the skill upgrade of poor labour to be conducive with higher economic growth.

Keywords: economic restructuring, social accounting matrix (SAM), economic growth, developing economies
JEL classification: D63, E65, F43, O20

1. INTRODUCTION

Most of the economic reforms in developing and transition economies are, in fact, price deregulation in the product markets -- trade liberalisation -- and they concern whether the growth of exports accelerates; whether structural change in exports occurs; and whether export quality upgrades to sustain overall growth. Much of these impacts are apparent through price changes. This paper, however, attempts to offer a new flavour in the policy reforms in developing and transition economies using fix price model to study the growth impact of different sector investment and transfers to households. We use the case of Nepal. Reform without loser has become the common wisdom in economics of transition, Lin, Cai and Li (1996). It requires that poor benefit more from reforms but rich also do not lose, rather they benefit less than the poor. Some authors, such as Lau et al. (1997 and 2000), emphasise to the reform commitments and compensation package to the losers after each reform in order to improve the efficiency in the dual-track model of market reform. Vélez and Pérez-Mayo (2006), however, followed the two redistributed income matrices in order to show how changes in final demand and in income transfers cause opposite effects in inequality. As an impact of economic reforms, output declined in Central and Eastern Europe by the disruption effects from the single-track model of reforms (Blanchard and Kremer 1997; Li, 1999; Roland and Verdier 1999). Jozef and Walsh (1999), however, considered restructuring of the economy as a disorganisation of employment and productivity growth in the transition from socialist to market economy and they were able to reveal that disorganisation basically comes from the supply constraints of employment and productivity growth during the process of transition. Rogerson (2002), however, emphasised the disorganisation of the urban sector for the overall restructuring of the South African economy.

Studies on economic reforms of transition economies of Eastern Europe are substantial, but those relating to developing and transition economies of South Asia are limited and mostly focussed on the Chinese economy. A number of authors have worked with sectoral analysis of Chinese reforms, examples include Sicular (1988); Murphy, Shleifer and Vishny (1992); and Byrd (1991). Although Lau et al. (1997); Zhang and Yi (1995); McMillan and Naughton (1992); Lin (1992); and Wu and Zhao (1987). They have explicitly discussed the need of articulating the efficiency and distributional parameters in connection with the dual-track reform for the transition economy; however, a systematic inclusion of these issues in the modelling and accounting framework is still lacking. This paper attempts to fulfil this need using the case of a South Asian, village, transition, and developing economy of Nepal that is lagging behind in policy studies. Moreover, we propose and test some restructuring strategies whether they are essential in developing win-win situations of higher growth and pro-poor distribution. These restructuring measures are simulated as structural reforms rather than that of price reform using social accounting matrix (SAM) multipliers commonly known as fixed-price multipliers. In conformity with

this objective, we conduct the following. We use the SAM-based multiplier analysis to test our hypotheses. We work with Nepal SAM 2006 as a real model, reconstruct a favourable scenario SAM for the same year 2006, and compare the multiplier properties of the two SAMs whether the restructuring proposed is strong enough to generate higher and pro-poor growth. This allows us to draw conclusions on developing win-win strategies for high-growth economy with pro-poor distribution. For this, we project a restructured SAM for some 10 years after 1996 with the viewpoint that proposed restructuring requires about one decade according to the existing trend of Nepalese economy on one hand and Nepal SAM 1996 is also available on the other. Therefore, we work with the realm of two SAMs: real SAM 2006 and restructured SAM 2006. As Readers would bear in mind that restructured Nepal SAM 2006 is a hypothetical but plausible scenario of a restructured economy. But the size of the economy in terms of GDP is fully consistent with the Nepalese economy in 2006 but its dissaggregation are according to our proposal of restructuring. This approach helps us test our hypothesis whether the restructurings proposed are conducive in generating pro-poor growth effects upon new investments and transfers.

The remainder of this paper is organised as follows. Section 2 analyses the income-expenditure flow structure in Nepalese economy using the SAM multiplier approach. It measures the impacts of demand and transfer injections in the economy specifically to different activities and household groups. We basically focus on distributional impacts of these internal shocks. Section 3 proposes some restructuring policies which are broadly divided into improving the efficiency parameters and redirecting the factor endowments. The section elaborates the systematic procedure for obtaining the prospective SAM 2006 starting from Nepal SAM 1996; however, this restructured SAM 2006 is also consistent with all the macroeconomic aggregates of Nepal as mentioned above for that year and the restructuring is only pertinent to efficiency parameters in activities and distribution parameters in investment by activities as well as income by household types and firm. This is compared with real Nepal SAM 2006 in terms of multiplier properties. After getting restructured SAM, in Section 4, we study the comparative properties of the two SAMs, real SAM 2006 and restructured SAM 2006, using the SAM multipliers. In Section 5, we apply relative distributive measure (RDM), introduced by Cohen (1988), to see the impacts on household income and growth in activities due to the increase in transfer earnings to households and demand creations to activities. This section responds to the question whether the structural reforms proposed could promote higher and pro-poor growth in the developing and transition economy such as Nepal. Section 6 concludes the paper.

2. INCOME EXPENDITURE FLOW STRUCTURE IN NEPAL: SAM MULTIPLIER APPROACH

Construction of SAM multipliers requires the specification of endogenous and exogenous accounts in the SAM. Here, we follow the convention and consider the government and the rest of the world (ROW) accounts in the exogenous block and the rest in the endogenous block. We use x for the vector of exogenous totals and y_n for the endogenous vector. Moreover, we use a coefficient matrix, A_n, which is the average propensity to expenditure of each endogenous cell calculated by dividing the same by the corresponding column total. Then, the vector of endogenous variables, y_n, can be expressed as:

$$y_n = A_n y_n + x \tag{1}$$

Equation 1 can also be written as:

$$y_n = (I - A_n)^{-1} x = M_a x \quad (2)$$

Here, M_a is the SAM multiplier matrix. If there are some impulses in the exogenous accounts, their impacts on endogenous accounts can be traced through the SAM multipliers. There are two types of impulses which are generally studied with SAM multipliers: demand creations to sectors and change in transfer earnings[1] to institutions. The impact of either impulse can be traced to the four types of endogenous accounts: expenditure by product, earning by factors, output by sectoral activities, and income by household groups. In this paper, however, we are interested with the last two endogenous accounts only, i.e., on sector outputs and household incomes. Although we use only four sub-matrixes in our analysis, in complete form, our SAM multiplier matrix is disaggregated with activities, commodities, households and factor types for both SAMs. To begin with real SAM 2006, Table 1 presents the output and income multiplier effects of demand creation to different activities. The output multiplier effects reveal that 1 unit demand increase in agriculture leads to the growth of agricultural output by 2.45 units (this is the 1 unit plus 1.45 more), industrial output by 1.31, commercial services by 1.29, and other services by 1.31 units. Altogether, this 1 unit demand increase in agriculture leads to total output growth by 4.60 units. Similarly, 1 unit demand increase in industry, commercial services and public services cause the growth of total output by 4.33, 4.53, and 4.62 units, respectively.

Considering the income multiplier effects of demand creations, the total household income grows by a multiplier of 2.90 due to 1 unit demand increase in agricultural sector. It is composed of 0.91, 0.67, 0.85, and 0.47 multipliers to Urban Households (U-HH), Large Rural Households (LR-HH), Small Rural Households (SR-HH) and Landless Rural Households (LLR-HH), respectively.[2] The household income growth is more among SR-HH followed by LR-HH. The reason behind these differential impacts on household incomes is the flow of capital and labour incomes from agricultural sector in relatively higher proportions to these two household groups as compared to other household groups (see Table 5 also). The ratio of income to output multipliers following the increase in demand in activities is highest in agriculture (0.63) and lowest in industry (0.56). The highest output and income multipliers of agriculture are due to the less agricultural imports – both intermediate and final. In total, agricultural imports share only 10% of total agricultural activities and commodities. Therefore, agriculture expenditure has more impacts resulting in higher multiplier effects in domestic economy. Contrary to this, in case of industrial expenditure, almost 23% of it goes to import -- comprising both intermediate and final imports. Therefore, relatively higher share of this expenditure, as compared to agriculture, goes as a leakage from the domestic economy (Table 1), thus, causing a slower multiplier impact. Table 2 shows the proportional distribution of the multiplier effects that follows from Table 1. The effect of demand increase is highest to the same sector because the injection first reaches there; it follows that the diagonal share in activity by activity and household by household matrixes (Tables 2 and 3) is always the highest in the column.

Table no. 1 SAM multipliers (real) 2006 of demand injections in activities

		Activities			
Size of multipliers		**AGR-A**	**IND-A**	**CS-A**	**OS-A**
Activities	**AGR-A**	2.45	1.31	1.29	1.31
	IND-A	0.91	1.95	0.94	0.97
	CS-A	0.98	0.83	2.01	1.05
	OS-A	0.27	0.24	0.29	1.28
Sum of output multipliers		4.60	4.33	4.53	4.62
Households	**U-HH**	0.91	0.77	0.89	0.90
	LR-HH	0.67	0.57	0.66	0.66
	SR-HH	0.85	0.70	0.82	0.82
	LLR-HH	0.47	0.37	0.43	0.46
Sum of income multipliers		2.90	2.42	2.80	2.84
Income/output multiplier		0.63	0.56	0.62	0.62

Note: AGR-A, IND-A, CS-A, and OS-A in this and following tables respectively refer to agricultural, industrial, commercial services, and other (public) services activities.

Table no. 2 Proportional distribution of the SAM multipliers (real) 2006 among activities and households

		Activities			
Proportional distribution		**AGR-A**	**IND-A**	**CS-A**	**OS-A**
Activities	**AGR-A**	0.53	0.30	0.28	0.28
	IND-A	0.20	0.45	0.21	0.21
	CS-A	0.21	0.19	0.44	0.23
	OS-A	0.06	0.05	0.06	0.28
Sum output multiplier		1.00	1.00	1.00	1.00
Households	**U-HH**	0.31	0.32	0.32	0.32
	LR-HH	0.23	0.24	0.24	0.23
	SR-HH	0.29	0.29	0.29	0.29
	LLR-HH	0.16	0.15	0.15	0.16
Sum income multiplier		1.00	1.00	1.00	1.00

Table 3 presents the impacts of the increase of transfer income to households on sectoral outputs and the overall income of households. One unit of income transfer to U-HH, which could be initiated by government or by the ROW, induces 1.44 units increase in agricultural activity due to the rise in food demand by this household group, among others. Moreover, the additional one unit transfer to this household group causes 0.94 units of growth in industrial activities, 1.12 units in commercial services activities and 0.29 units in other services activities. Similarly, the effects of the increase of the one unit transfer income of other household groups' incomes can be studied from the table. It is clear that due to the higher average propensity to food consumption as compared to other types of goods and self-propelling nature of agricultural production, the output multiplier of agricultural activities is quite high in Nepal among all household groups. Agricultural output multiplier due to the increase in transfer income by household type is highest (1.68) among poorest

households, LLR-HH, followed by the multiplier (1.61) to the next poor household group, SR-HH. Likewise, increase in the transfer income to LLR-HH has highest impact on total output multiplier (3.98) followed by the increase in transfer income to SR-HH (3.96). The growth of transfer income to households has both direct and indirect feedback effects on household income. Table 3 shows that one unit growth in transfer income to U-HH induces exactly one unit growth in household income as a direct effect and 0.73 unit of growth as an indirect effect. Likewise, one unit transfer injection to LR-HH, SR-HH, and LLR-HH causes respectively 0.52, 0.70, and 0.39 units of the growth to their household income as an indirect effect. Overall, the total income multiplier by transfer injection is highest if it is made through LLR-HH (3.44) followed by through SR-HH (3.40). This is because these household groups have higher average propensity to consume and they are also the producers of own consumption as well as consumption of others, which induce more production leading to the overall growth of household incomes. Income output multipliers ratio does not vary much among household groups. They are within the range of 0.81 to 0.93.

Table no. 3 SAM multipliers (real) 2006 of transfer injections to households

		Households			
Size of multipliers		**U-HH**	**LR-HH**	**SR-HH**	**LLR-HH**
Activities	**AGR-A**	1.44	1.36	1.61	1.68
	IND-A	0.94	1.06	1.07	0.99
	CS-A	1.12	0.98	0.99	0.97
	OS-A	0.29	0.27	0.29	0.34
Sum output multiplier		3.78	3.68	3.96	3.98
Households	**U-HH**	1.73	0.70	0.76	0.77
	LR-HH	0.54	1.52	0.56	0.57
	SR-HH	0.68	0.64	1.70	0.71
	LLR-HH	0.37	0.35	0.38	1.39
Sum income multipliers		3.31	3.21	3.40	3.44
Income /output multipliers		0.88	0.81	0.93	0.87

The multiplier analysis shows that agricultural activities have more multiplier effects in Nepalese economy; more specifically, the middle income groups benefit most from the investment in agriculture because of their possession of capital and labour income from agriculture in higher proportions as compared to other household groups. But, if the transfer injections are made through poorest household group, it has more multiplier effects to the economy because of the higher propensity to consume as compared to the transfer effects generated from other household groups.

3. RESTRUCTURING THE ECONOMY

As mentioned earlier, this section presents a hypothetical but realisable Nepal SAM 2006 (2) as a reflection of all the restructurings proposed. While preparing the Nepal SAM 2006 (2) – first macro and then disaggregated -- starting from the SAM 1996, we adopted the following procedure. In the first round, we upgrade the accounts and incorporate

some restructurings related to the efficiency aspects. In the second round, in disaggregating the macro SAM, we assume a redistribution of investment -- more investment going to faster growing activities according to the ongoing openness and globalisation of the Nepalese economy that are also reinforced by the nature of circular flow of income/expenditures of Nepalese economy. Moreover, we also restructure the factor income distribution by household groups, activities, and factor types. In this restructuring, poor household groups are supposed to receive more factor income from activities that have higher-circular flow activities whereas the rich groups from slower-circular flow activities. In order to capitalise this tendency, we conceive of a restructured economy for 2006 that puts more investment in agriculture. Furthermore, agricultural activities possess strong input-output relation with industrial activities; see Acharya (2006), therefore, investment needs to be enhanced in industrial activities too. Moreover, these two sectors reveal the prospect of higher growth as an impact of liberalisation reforms of Nepalese economy; see Acharya and Cohen (2008), and Acharya (2006). This reinforces the need of boosting investment in these two sectors during the restructuring on top of their normal trends.

3.1. Improvement in efficiency parameters

In the first round, we did the followings and got the macro-SAM as given in Table 4.

I. We have made 1.5% additional investment in agriculture and 0.5% additional investment in industries on top of their normal trends.

II. The higher investment in agriculture and industries is partly by private and partly by public sectors. The rise in investment is also partially financed by the inflow of higher foreign capital. Overall, it allows a relatively higher level of import as compared to SAM 1996.

III. To enhance the efficiency in production activities, we increase the factor share in activities. Factor input as a proportion of the total production activities increase from 0.60 to 0.64 reflecting higher efficiency in the restructured economy. Intermediate deliveries as a proportion of the total production activities decline from 0.30 to 0.27.[3] Echevarria (1997) has also followed similar approach of the variation in factor intensity while formulating a dynamic Computable General Equilibrium (CGE) model for comparing the growth paths of the 13 industrialised countries.

3.2. Redirecting the factor endowments

With respect to the second round restructuring, we did the followings:

I. In obtaining the disaggregated macro-SAM 2006 (2), we started with the distribution pattern of income-expenditure blocks of different sub-accounts in SAM 1996, see Acharya (2006), as a reference point but we incorporated a redirection of endowments of the lower income population towards the sectors with faster growth and higher circular impact of the investment in the economy.

II. In the factor market, the wage share in total value added has been slightly increased at the cost of profit share. These adjustments take the form of a premium of 3% growth in the total share of low-skilled wage, 1.5% growth in the total share of high-skilled wage, and around 4.5% decline in the total share of profit. This decline in the profit share is by approximately 1.5% from each household category except from landless rural households that has a very little share of profit in their incomes.

III. These adjustments of wage and profit shares are carried further to the activity account. The public service sector being a highly labour intensive has been kept in its original factor distribution pattern. In the cases of agriculture, industry, and commercial services, we applied a 3% increase in low-skilled wages, 1.5% to the high-skilled wage earning and around 4.5% decline in the profit share.

IV. For the other accounts, the distributions follow the same pattern of the real SAM 2006 (1).

V. The imbalances are rebalanced via rational adjustments in the respective account aiming at minimising the deviations from the inserted levels.

VI. Contribution by the foreign saving has been taken as a residual to balance the rest of the world (ROW) account and the national capital account (S-I).

The implementation of the above procedures leads us from Table 4 to Table 7 as shown below. Therefore, Table 7 represents a restructured and plausible economy of Nepal.

Table no. 4 Nepal macro-SAM 2006 (values in million Rupees)

	Factors	Households	Firms	Gov.	S - I	Activities	Comm.	ROW	Total
Factors						354624			354624
Households	331167			5200				5035	341402
Firms	23457			9901					33358
Government		7363	8840				25179	10698	52079
S - I		38971	24518	1656				46271	111416
Activities							550126		550126
Commodities		295068		35323	111416	150045		62465	654316
ROW						45457	79012		124469
Total	354624	341402	33358	52079	111416	550126	654317	124469	2221791

Note: (i) Commodity account paying to the government (Rupees 25,179 million) includes both domestic indirect tax (Rs. 13893 mi.) and the tariff (Rs. 1,1286 mi.).
(ii) Gov., S – I, and Comm. refer to government, saving-investment, and commodity accounts, respectively. Likewise, ROW is for rest of the world.

The envisaged restructuring of the economy would become complete after disaggregating the factor income from activities by firms and households types. The guiding principle for the pro-poor distribution of these factor earnings in the long run is that the shares of value added from agriculture and industries would go more to the poorer household categories as they have higher circular impacts of domestic investments. Furthermore, these are the two expanding sectors in the course of economic reform in Nepal; see Acharya and Cohen (2008). Being the poorest of the poor, LLR-HH chiefly sells its unskilled labour to these two growing sectors. In addition to the wage earning, the second poor household group, SR-HH, also has some profit earning from their capital. In the restructuring, therefore, the profit from invested capital of the small rural household group has been made coming basically from the agricultural and industrial sectors. In consequence, the composition of the income of the richer household groups – UHH and LRHH -- would come more from service sectors. This greater link with the service sectors would apply to the U-HH followed by the LR-HH. Here, one question arises what would be the effective restructuring policies the government can pursue in promoting the agricultural

and industrial activities of the poor? It would be possible for the government to upgrade skills and trainings to LLR-HH group in the villages pertinent to the agricultural and agro-based industrial activities; see also the arguments by Palmer (2007) for the welfare of Ghana rural poor. Regarding the SR-HH group, the implications of the public policy is the provision of incentives to them to invest in modern agricultural activities and agro-based industries. The expected results of this restructuring is that the poorer households would be more linked to agricultural and industrial sectors which grow faster while opening the Nepalese economy to the rest of the world as well as from the domestic investment and transfer flows. In relative terms, the income shares of the richer household categories would be more linked to the services sectors, which grow slowly under these reforms. Keeping these policies in mind, the household-activities-factor income distribution matrix has been given in Table 8. There are very small exceptions in some cells, which have not changed in the prescribed way because some of them had to work for balancing the matrix. In total, poorer household groups have moved towards agricultural and industrial activities and richer households towards services. The absolute distribution of the factor income to real SAM 2006 (1) is presented in Table 7 and policies that bringing these changes have been explained in the previous paragraph.

Table no. 5 Distribution of the macro-SAM into different sub-accounts based on (real) SAM 2006 proportions

	Activities				Commodities				Factors			Households				Firms	GOV	S-I	YTAX	STAX	TAR	ROW
	AGR-A	IND-A	CS-A	OS-A	AGR-C	IND-C	CS-C	OS-C	WLSL	WHSL	PROFIT	U-HH	LR-HH	SR-HH	LLR-HH	Firms	GOV	S-I	YTAX	STAX	TAR	ROW
AGR-A					0.326																	
IND-A						0.314																
CS-A							0.261															
OS-A								0.099														
AGR-C	0.133	0.190	0.000	0.001								0.120	0.061	0.152	0.102			0.152				0.104
IND-C	0.002	0.200	0.042	0.039								0.050	0.039	0.084	0.035			0.562				0.608
CS-C	0.078	0.044	0.136	0.048								0.129	0.044	0.056	0.028			0.247				0.287
OS-C	0.007	0.023	0.046	0.011								0.028	0.018	0.026	0.028			0.039				0.000
WLSL	0.172	0.044	0.075	0.054																		
WHSL	0.033	0.038	0.023	0.041																		
PROFIT	0.186	0.131	0.194	0.007																		
U-HH									0.091	0.053	0.154						0.095					0.114
SR-HH									0.121	0.029	0.122						0.424					0.251
LR-HH									0.049	0.037	0.124						0.084					0.102
LLR-HH									0.085	0.016	0.046						0.397					0.533
FIRMS											0.072											
GOV																						
S-I												0.179	0.614	0.171	0.036							
YTAX												0.522	0.478	0.000	0.000							
STAX					0.193	0.520	0.213	0.074														
TAR					0.146	0.231	0.253	0.370														
ROW	0.106	0.214	0.076	0.034	0.091	0.186	0.143	0.150														

Note: Several main accounts are distinguished in a SAM. These include factors, institutions, activities, commodities, and the rest of the world. Each account can be further disaggregated into many sub-accounts based on the socio-economic structure of the economy under consideration and the need of the particular policy modelling. In our case, the factor account has been divided into three main accounts namely, unskilled labour, skilled labour, and capital (including land). Their remunerations are respectively WLSL, WHSL, and PROFIT in this table. The current accounts of institutions have been categorised into three main sub-accounts: households, firms, and government. Moreover, the household account has been further divided into four different types: urban households, large rural households, small rural households, and land-less rural households, (U-HH, LR-HH, SR-HH, and LLR-HH, respectively). This sub-division of households is based on various socio-economic characteristics, regional attributes and other endowment characteristics applicable to Nepal. There is an aggregate capital account (national accumulation) for all institutions taken together. The activity account comprises four major sub-accounts: agriculture, manufacturing, commercial services, and other services (AGR-A, IND-A, CS-A, and, OS-A, respectively). A similar pattern (AGR-C, IND-C, CS-C, and OS-C, respectively) is followed in case of the commodity account. In this table, Gov., S-I, and ROW are government, national capital (saving-investment), and rest of the world accounts. YTAX, STAX, and TAR are the income tax, sales tax, and tariff accounts, respectively.

Table no. 6 Pro-poor distribution of the macro-SAM (restructured) 2006

	Activities				Commodities				Factors			Households				FIRMS	GOV	S-I	YTAX	STAX	TAR	ROW
	AGR-A	IND-A	CS-A	OS-A	AGR-C	IND-C	CS-C	OS-C	WLSL	WHSL	PROFIT	U-HH	LR-HH	SR-HH	LLR-HH	FIRMS	GOV	S-I	YTAX	STAX	TAR	ROW
AGR-A					0.326																	
IND-A						0.314																
CS-A							0.261															
OS-A								0.099														
AGR-C	0.133	0.190	0.000	0.001								0.120	0.061	0.152	0.102			0.169				0.104
IND-C	0.002	0.200	0.042	0.039								0.050	0.039	0.084	0.035			0.565				0.608
CS-C	0.078	0.044	0.136	0.048								0.129	0.044	0.056	0.028			0.229				0.287
OS-C	0.007	0.023	0.046	0.011								0.028	0.018	0.026	0.028			0.037				0.000
WLSL	0.182	0.054	0.085	0.054																		
WHSL	0.038	0.043	0.028	0.041																		
PROFIT	0.171	0.116	0.179	0.007																		
U-HH									0.101	0.058	0.139						0.095					0.114
SR-HH									0.131	0.034	0.107						0.424					0.251
LR-HH									0.059	0.042	0.109						0.084					0.102
LLR-HH									0.085	0.016	0.046						0.397					0.533
FIRMS											0.072											
GOV																						
S-I												0.179	0.614	0.171	0.036							
YTAX												0.522	0.478	0.000	0.000							
STAX					0.193	0.520	0.213	0.074														
TAR					0.146	0.231	0.253	0.370														
ROW	0.126	0.214	0.076	0.034	0.091	0.186	0.163	0.110														

Table no. 7 Disaggregated social accounting matrix of Nepal (restructured) 2006 (values in million Rupees, 1996 price level)

	Activities				Commodities				Factors			Households				FIRMS	GOV	S-I	YTAX	STAX	TAR	ROW	Total
	AGR-A	IND-A	CS-A	OS-A	AGR-C	IND-C	CS-C	OS-C	WLSL	WHSL	PROFIT	U-HH	LR-HH	SR-HH	LLR-HH	FIRMS	GOV	S-I	YTAX	STAX	TAR	ROW	
AGR-A					186005																		186005
IND-A						169308																	169308
CS-A							142195																142195
OS-A								57374															57374
AGR-C	19901	28482	18	98								33722	16180	45722	32218			23630				6504	206475
IND-C	302	30053	6238	5903								14610	11060	24970	11619			62915				38003	205673
CS-C	11688	6630	20427	7170								37160	12763	17243	8827			25558				17958	165424
OS-C	1048	3521	6952	1613								8204	4922	7815	8032		35323	4070				0	81500
WLSL	65578	23094	32162	19906																			140740
WHSL	10754	14081	6861	16388																			48084
PROFIT	65504	40879	61499	2674																			170556
U-HH									37574	19125	45549						494					575	103317
LR-HH									23692	12346	39467						435					514	76454
SR-HH									47787	9262	42220						2204					1263	102736
LLR-HH									31687	7352	18490						2066					2683	62278
FIRMS									0	0	24830						9901						34731
GOV																			16203	13893	11286	10698	52080
S-I												5700	28087	6986	1582	25891	1656					46271	116173
YTAX												3921	3442	0	0	8840							16203
STAX					2719	7111	2977	1086															13893
TAR					2070	2732	2580	3904															11286
ROW	11230	22568	8038	3622	15682	26522	17671	19136															124469
Total	186005	169308	142195	57374	206476	205673	165423	81500	140740	48085	170556	103317	76454	102736	62278	34731	52079	116173	16203	13893	11286	124469	2286954

Table no. 8 Factor shares to households and firms for SAM (restructured) 2006

Households and firms	Activities and factors											
	AGR-A			IND-A			CS-A			OS-A		
	WLSL	WHSL	PROFIT	WLSL	WHSL	PROFIT	WLSL	WHSL	PROFIT	WLSL	WHSL	PROFITI
U-HH	0.157	0.117	0.095	0.202	0.332	0.400	0.555	0.634	0.359	0.240	0.540	1.000
LR-HH	0.165	0.275	0.292	0.157	0.236	0.097	0.187	0.154	0.212	0.162	0.306	0.000
SR-HH	0.460	0.329	0.308	0.192	0.124	0.323	0.149	0.212	0.168	0.422	0.154	0.000
LLR-HH	0.218	0.279	0.304	0.450	0.309	0.000	0.109	0.000	0.000	0.176	0.000	0.000
FIRM	0.000	0.000	0.000	0.000	0.000	0.180	0.000	0.000	0.262	0.000	0.000	0.000
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table no. 9 Distribution of the factor income to household and firms for SAM (restructured) 2006 (values in million Rupees)

Households and firms	Activities and factors											
	AGR-A			IND-A			CS-A			OS-A		
	WLSL	WHSL	PROFIT	WLSL	WHSL	PROFIT	WLSL	WHSL	PROFIT	WLSL	WHSL	PROFIT
U-HH	10284.62	1259.07	5808.44	4656.68	4670.91	14988.63	17855.15	4350.18	22078.86	4777.61	8845.31	2673.07
LR-HH	10834.38	2956.64	22501.95	3617.9	3316.87	3956.87	6013.48	1057.8	13008.18	3226.37	5014.41	0
SR-HH	30159.46	3538.25	18703.73	4432.5	1741.52	13197.08	4793.38	1453.24	10318.88	8401.93	2528.62	0
LLR-HH	14300	3000	18489.88	10386.98	4352.18	0	3500	0	0	3500	0	0
FIRM	0	0	0	0	0	8736.35	0	0	16093.27	0	0	0
Total	65578.46	10753.96	65504	23094.06	14081.48	40878.93	32162.01	6861.22	61499.19	19905.91	16388.34	2673.07

4. COMPARISON BETWEEN REAL NEPAL SAM 2006 (1) AND RESTRUCTURED NEPAL SAM 2006 (2)

Here, we briefly comment on the differences between real 2006 (1) and restructured 2006 SAM (2) multipliers generated from the demand creations to sectors and transfer additions to households and their impacts on sectoral outputs and household incomes. In the projected scenario of SAM 2006 (2), demand creations in all the sectors have almost similar multiplier effects (Table 10) to that of real SAM 2006 (1) (Table 1) signifying very minimal changes in other accounts have occurred except that of the factor endowment distribution. The combined share of these two exogenous accounts in total circular flow has remained about 9.5% in both (SAM 2006 (1)) and (SAM 2006 (2)) that implies very minimal change in other accounts. Therefore, the effectiveness of these restructuring policies can be easily gauged in deriving pro-poor distribution.

Table no. 10 SAM multipliers (restructured) 2006 of demand injection in activities

		Activities			
		AGR-A	**IND-A**	**CS-A**	**OS-A**
Activities	**AGR-A**	2.36	1.24	1.21	1.23
	IND-A	0.81	1.84	0.83	0.87
	CS-A	0.91	0.76	1.96	0.95
	OS-A	0.23	0.21	0.26	1.24
Sum output multiplier		4.32	4.05	4.26	4.29
Households	**U-HH**	0.84	0.70	0.81	0.83
	LR-HH	0.62	0.52	0.60	0.60
	SR-HH	0.83	0.68	0.79	0.79
	LLR-HH	0.48	0.39	0.45	0.47
Sum income multiplier		2.77	2.29	2.65	2.69
Income/output multipliers		0.64	0.57	0.62	0.63

The same logic works for the size of multipliers that show the impact of the one unit demand creation in sectors to household incomes. For example, one unit demand increase in agriculture results in an output multiplier of 4.60 in 2006 (1) compared to 4.32 in 2006 (2), while the income multiplier of 2.90 in 2006 (1) reaches 2.77 in 2006 (2). As a result, there is a slight improvement in the income/output multiplier ratio in 2006 (2) as compared to 2006 (1), for example, 0.64 from 0.63 in case of agriculture. This is largely due to the stipulated overall rise of the efficiency parameters in the prospective SAM 2006 (2), which was argued to be in line with higher stages of economic development and a more global setting. Comparing the proportional distribution of the multipliers from demand creations in activities between real SAM 2006 (1) and restructured SAM 2006 (2) we find only a small difference. They follow similar distributional pattern. The same applies to the distribution pattern of income effects on household groups. The LLR-HH group gains slightly more at the loss of LR-HH -- both belonging to the rural groups. This effect is primarily due to the postulated adjustments in the restructured SAM 2006(2).[4]

Table no. 11 SAM multipliers (restructured) 2006 of transfer injection to households

		Households			
Size of multipliers		**U-HH**	**LR-HH**	**SR-HH**	**LLR-HH**
Activities	**AGR-A**	1.35	1.28	1.52	1.58
	IND-A	0.82	0.95	0.94	0.87
	CS-A	1.07	0.92	0.91	0.89
	OS-A	0.25	0.24	0.25	0.29
Sum output multiplier		3.49	3.40	3.62	3.63
Households	**U-HH**	1.66	0.63	0.68	0.69
	LR-HH	0.49	1.47	0.50	0.51
	SR-HH	0.65	0.62	1.67	0.68
	LLR-HH	0.37	0.36	0.39	1.39
Sum income multiplier		3.17	3.07	3.24	3.26
Income/output multipliers		0.91	0.90	0.89	0.90

The multipliers of transfer injections to households show small differences between real SAM 2006 (1) and restructured SAM 2006 (2) (Table 3 and Table 11). We explain the changes using relative distributive measure in the following section.

5. RELATIVE DISTRIBUTIVE MEASURE (RDM) ANALYSIS

Besides analysing the levels of multipliers, it is also important to study the distribution of the multiplier effects across sectors and households, and in this way discover the underlying structural bias in the SAM. To meet this objective, we calculate the Relative Distributive Measure (RDM) from these output and income multipliers – the concept introduced by Cohen (1988). It measures the direction of biasness in the SAM multipliers, indicating which sectors and household groups are more (or less) favoured as a result of demand creations or additional transfer incomes in the economy. Equations 3 and 4 define RDM for output and income multipliers ($RDM_{ss'}$ and $RDM_{hs'}$ respectively) generated from demand creations to sectors. Likewise, equations 5 and 6 compute RDM for output and income multipliers ($RDM_{sh'}$ and $RDM_{hh'}$, respectively) generated from transfer incomes to household groups. Cohen (2002) also used RDMs in making a comparative study of SAM multipliers among some eastern and western European economies.

$$RDM_{ss'} = \frac{\left(M_{a,ss'} - d_{ss'}\right)}{\left(\sum_s M_{a,ss'} - 1\right)} \Big/ \frac{Output_{s,0}}{\sum_s Output_{s,0}} \tag{3}$$

$$RDM_{hs'} = \frac{M_{a,hs'}}{\sum_h M_{a,hs'}} \Big/ \frac{Income_{h,0}}{\sum_h Income_{h,0}} \tag{4}$$

$$RDM_{sh'} = \frac{M_{a,sh'}}{\sum_s M_{a,sh'}} \Big/ \frac{Output_{s,0}}{\sum_s Output_{s,0}} \tag{5}$$

$$RDM_{hh'} = \frac{M_{a,hh'} - d_{hh'}}{\sum_h M_{a,hh'} - 1} / \frac{Income_{h,0}}{\sum_h Income_{h,0}} \quad (6)$$

where $M_{a,ss'}$ and $M_{a,hs'}$ represent output multipliers and income multipliers, respectively, generated from demand injections to sectors. Likewise, $M_{a,sh'}$ and $M_{a,hh'}$ are the output multipliers and income multipliers generated from transfer injections to households. Here, s and h represent economic sector and household group, respectively. These multipliers are component blocks of the SAM multiplier matrix (M_a) as shown in Acharya (2007). In these equations, $M_{a,ss'}$ is divided by the column sum of multipliers of *s* after deducting the initial injection. Here $d_{ss'}$ stands for the Kronecker symbol that equals 1 if *s*=*s'* and 0 in other cases. Similar is the case for $M_{a,hh'}$. We take $d_{hh'}$= 1 if d = d'. These subtractions are to remove the direct impacts of demand (transfer) injections to the same sector (household). Furthermore, in the case of the output multiplier, the result is divided by the recorded (actual) output share of sector *s* in year 0, as found in the SAM for the recorded year 0. Similarly, in the case of the income multiplier, the result is divided by the recorded (actual) income share of that household group h in the recorded year 0. For values of RDM >1, <1, and = 1, there are positive, negative and neutral redistributive effects. For instance, values of $RDM_{ss'}$ = 1 mean that sector injections would reproduce exactly similar sector distribution pattern of the recorded year. Household or sector with RDM above unity enjoys a favoured position and vice versa. Likewise, similar interpretations can be made for the three other RDMs. Applied to real Nepal SAM 2006 (1), Table 12 shows demand creations in activities which result in a favourable bias towards agriculture. Moreover, there is favourable bias to commercial services activities as well. Overall, sector injections do give more favour to agricultural growth, followed by commercial services. Industry and public services get disfavoured redistributive effects. The agricultural dominance of the economy has been very vividly shown by the RDM. Turning to household income effects, a demand creation to agricultural activities has positive redistributive impact to urban households and small rural households and a negative redistributive impact to other households.

Table no. 12 RDM (real) 2006 of demand injections in activities

		RDM by activities				
RDM		**AGR-A**	**IND-A**	**CS-A**	**OS-A**	**average**
$RDM_{ss'}$	**Activities**					
	AGR-A	1.24	1.22	1.13	1.12	1.18
	IND-A	0.83	0.94	0.88	0.89	0.88
	CS-A	1.06	0.98	1.12	1.14	1.07
	OS-A	0.63	0.60	0.70	0.65	0.65
$RDM_{hs'}$	**Households**					
	U-HH	1.01	1.03	1.02	1.02	1.02
	LR-HH	0.79	0.81	0.81	0.80	0.80
	SR-HH	1.28	1.26	1.26	1.26	1.26
	LLR-HH	0.96	0.92	0.92	0.97	0.95

Regarding the transfer injections to household groups, the agricultural sector gets a positive impact in all the cases (Table 13). However, the RDM for agriculture is higher from

transfer injections to rural poor household groups than from the rich household groups because of the stronger linkages among production, income and consumption established between the rural poor and the agricultural sector. Transfer injections to richer household groups, U-HH and LR-HH, have positive redistributive impacts to commercial services. Transfer injections to all household groups have negative redistributive impacts to industry and public services. Finally, there are RDM_{hh}, as well (Table 13). There are very little variations among rich and upper-poor households in this regard; however, poorest households (LLR-HH) do have smaller redistributive impact.

Table no. 13 RDM (real) 2006 of transfer injection to households

		RDM by household groups				
RDM		**U-HH**	**LR-HH**	**SR-HH**	**LLR-HH**	**average**
RDM_{sh},	**Activities**					
	AGR-A	1.18	1.14	1.26	1.31	1.22
	IND-A	0.82	0.95	0.89	0.82	0.87
	CS-A	1.16	1.05	0.98	0.96	1.04
	OS-A	0.64	0.63	0.62	0.72	0.65
RDM_{hh},	**Households**					
	U-HH	0.71	0.70	0.72	0.72	0.71
	LR-HH	0.71	0.70	0.71	0.72	0.71
	SR-HH	0.70	0.69	0.71	0.71	0.70
	LLR-HH	0.66	0.65	0.67	0.67	0.66

Comparison between the RDMs following the real SAM 2006 (1) and restructured SAM 2006 (2) shows that the poorest gains more in SAM 2006 (2) than in SAM 2006 (1) from the demand creations in industrial activities and commercial services. This is an important achievement from the restructuring that the livelihood of the poorest is now linked with the modern sectors of the economy. Moreover, in other two sectors as well, the RDMs do not decline but remains in their previous level. This reveals that restructuring made is conducive to the pro-poor growth (See Tables 12 and 14).

Table no. 14 RDM (restructured) 2006 of demand injections in activities

		RDM by activities				
RDM		**AGR-A**	**IND-A**	**CS-A**	**OS-A**	**average**
RDM_{ss},	**Activities**					
	AGR-A	1.30	1.21	1.11	1.12	1.18
	IND-A	0.80	0.91	0.83	0.86	0.85
	CS-A	1.07	0.98	1.15	1.12	1.08
	OS-A	0.68	0.66	0.76	0.72	0.70
RDM_{hs},	**Households**					
	U-HH	1.01	1.02	1.01	1.03	1.02
	LR-HH	0.75	0.76	0.76	0.75	0.76
	SR-HH	1.36	1.34	1.35	1.32	1.34
	LLR-HH	0.96	0.94	0.94	0.97	0.95

Analysing the distributionary impacts of the increase of transfer incomes to households on receiving sectors (RDMsh'), we could not see any significant difference between real SAM 2006 (1) and restructured SAM 2006 (2) scenarios. In case of the distributionary impact of transfer injection to households on receiving households (RDMhh'), however, some differences are observed. Increase in transfer injection through poorest household group (LLR-HH) has positive redistributive impact on public services activities (OS-A); the RDM in this case has swelled to 0.77 from 0.72 (See Tables 13 and 15).

Table no. 15 RDM (restructured) 2006 of transfer injection to households

		RDM by household groups				
RDM		**U-HH**	**LR-HH**	**SR-HH**	**LLR-HH**	**average**
RDM_{sh}'	**Activities**					
	AGR-A	1.15	1.13	1.25	1.30	1.21
	IND-A	0.77	0.92	0.85	0.78	0.83
	CS-A	1.19	1.06	0.98	0.96	1.05
	OS-A	0.70	0.69	0.68	0.77	0.71
RDM_{hh}'	**Households**					
	U-HH	0.69	0.69	0.70	0.70	0.70
	LR-HH	0.70	0.69	0.70	0.70	0.70
	SR-HH	0.69	0.68	0.69	0.70	0.69
	LLR-HH	0.65	0.64	0.66	0.66	0.65

In this SAM multiplier analysis, we could observe that restructured scenario 2006 (2) is slightly more favourable for growth, specifically for the pro-poor growth. It is the impact of the economic restructuring proposed in Section 3.

6. CONCLUSIONS

SAM-based multiplier model analyses the changes in the flow structure of an economy due to the change in demand creations in activities and increase in the transfer income of institutions -- especially that of the households. In the existing flow structure of the Nepalese economy, one unit of demand creation in agriculture, industry, commercial services and other services activities causes 4.60, 4.33, 4.53, and 4.62 units of increase in overall demand, respectively. Likewise, they respectively cause 2.90, 2.42, 2.80, and 2.84 units of increase in total household demand. One unit of increase in transfer income to urban, large-rural, small-rural, and landless-rural household groups cause 3.78, 3.68, 3.96, and 3.98 units of increase in overall demand in this economy. Likewise, they respectively increase 3.31, 3.21, 3.40, and 3.44 units of increase in total household income. RDM analysis shows the bigger impacts of the demand creation through agricultural activities followed by commercial services activities in Nepalese economy. Likewise, transfer to households also favour agricultural sector more than other sectors. This impact is biggest if the transfer is made through the poorest household group. In essence, demand creation to agricultural sector and transfers to poorest household group generate the highest growth in income expenditure flows in Nepalese economy. In this paper, we have proposed some

modes of restructuring to the developing economies, such as Nepal, to make the restructuring conducive to the pro-poor growth. To this end, the scaling-up of efficiency parameters in production and redirecting factor endowments among institutions are required. The scaling-up of efficiency parameters are reflected via the reduction in intermediate deliveries and intermediate imports per unit of an activity. These measures pave the way to raise the proportions of factor inputs across activities. From this stage, we propose the restructuring in two stages. In the first stage, we incorporate the strategy of promoting labour intensive mode of production as reflected by the higher share of wage bill in value added that filters to poor households who draw their income basically from low-skilled labour. This adjustment implies a slightly declined share of profit in different activities. In the second round, it is crucial to make the reallocation of labour and capital -- more specifically, channelling more factor income to poorer household groups from those sectors which have more circular flow impact, i.e., agriculture in the Nepalese case as shown by the SAM multiplier analysis. Furthermore, in order to make the lasting impact of this effort, investment in agriculture requires upward spiral followed by the investment in industrial activities. It is because these two sectors have strong input-output linkages in Nepalese economy as compared to the linkages of agricultural activities with service sectors. The public policies to promote this redistribution can be designed in manners that allow labour from land-less rural households -- the poorest of the poor -- to receive some skill trainings pertinent to agricultural and agro-based industrial activities so that they will reallocate more to agriculture and industry and enjoy the benefit from the investment flows in these two sectors. Likewise, policies need to be formulated in such manners that small rural households -- the second poor household category -- will be inclined to invest the capital at their disposal to these two sectors so that they will also get higher benefits from existing flow structure. Under this new scenario, the income of the richer household groups grows slower than that of the poor household categories indicating the pro-poor growth spiral in the economy. Incorporating all these policy measures, we formulated the restructured Nepalese economy (2006) and carried out the same multiplier analysis which was first applied to real SAM (2006). The restructured economy reveals the prospect of favouring the poor in the free interplay of the market forces. The output multiplier towards agriculture and the income multiplier towards the poorest household categories have improved, which signify that the proposed restructuring measures reveal the prospect of transforming the developing and transition economy such as Nepal towards the pro-poor growth path. Therefore, in order to make these flow structures favouring the poor, economic restructuring in line with what has been proposed in Section 3 of this paper is deemed necessary.

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Notes

[1] In terms of economic policies, demand creation to sectors basically refers to investment demand. If investment is boosted in one sector, its sectoral demand increases. Likewise, the transfer earning to sectors or institutions can be increased by subsidies to them.

[2] In terms of economic policies, demand creation to sectors basically refers to investment demand. If investment is boosted in one sector, its sectoral demand increases. Likewise, the transfer earning to sectors or institutions can be increased by subsidies to them.

[3] Share of factor input and intermediate deliveries do not add to 1 because there are imported intermediate deliveries as well. The share of these has been estimated to have slightly declined from 0.1 to 0.09.

[4] For example, LLR-HH would get 0.48 out of a 2.65 income multiplier in 1996 (or 18%), as compared to 0.58 out of an income multiplier of 2.85 (or 20%) in 2006. Similar figure for LR-HH falls from 25% to 22%. This change is an example how the restructured economy works in favour of the poor.