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Fiscal Policy and Its Role in Reducing Income Inequality: A CGE Analysis for Pakistan

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1. INTRODUCTION

Income inequality is one of the critical barriers to growth and development in most of the developing countries including Pakistan. Every third man in Pakistan falls below the poverty line[1]. Moreover, the budget deficit has also been a serious issue throughout the history of Pakistan's economy. The persistent budget deficit is the constant source of increasing poverty and deterioration of income distribution. Since deficit is financed by increasing indirect taxes and money supply, it causes the reduction in purchasing power and leads the masses towards poverty [Arif and Farooq (2011)]. Therefore, it is a dire need of the economy to have a good public policy such that it could reduce budget deficit, alleviate poverty and redistribute income. Malik and Saqib (1985) suggest that the resources of the economy can be distributed equally only through appropriate changes in the tax system. Fiscal policy can have a significant influence on removing the gap between haves and have-nots both directly and indirectly. It directly affects the disposable income of individuals, whereas affecting their future earning capacities indirectly.

It is important to note that there is a significant trade-off between equity and efficiency. The policies focusing on equity, by hitting the current and future income of investors, may discourage investors from investment. For example, income transfers may reduce inequality which results in the diversification of scarce resources from investment to subsidisation of consumption; consequently, it reduces economic growth by negatively affecting investment. Therefore, it is pertinent to consider how much cost the economy has to bear in the form of decreased economic growth. The International Monetary Fund (IMF) and other financial institutions stress Pakistan on reducing fiscal deficit. With reference to income distribution, an IMF policy paper[2] emphasises that high income inequality results in impeding macroeconomic stability. Thus, policies related to tax and expenditure may be designed in such a way that the economy could achieve both the distributional and efficiency objectives during fiscal consolidation. Therefore, considering the significance of good governance, this study focuses on the impact of

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[1]SDPI's study (2012).

[2]IMF Policy Paper, "Fiscal policy and income inequality" January 23, 2014.

fiscal policy on income distribution and their possible trade-off, since the application of fiscal policy may involve the issue of trade-off between equity and efficiency[3]. Further, it investigates the most feasible mixture of taxes and transfers.

Plan of the paper is as follows: This section introduces the problem. The review of literature is given in second section. Third section discusses the methodology. Section four provides results and discussion. Finally, conclusion and policy implications are provided in section five. References are also provided at the end of this study.

2. LITERATURE REVIEW

Income inequality remains a core issue in designing an effective fiscal policy. In case of Pakistan, Suleman (1973) observes the income inequalities to be increasing over the period of 1963-69, whereas Khandkar (1973) shows that the trend in income inequality is decreasing over the period of 1963-69. In 1980s, most of the studies focus on measuring income inequality using different indices [Mahmood (1984)], while merely few studies are based on making redistribution strategies [Cheema and Malik (1985)]. Many studies have been conducted in developed and developing countries to find out the effective policy measures to reduce the inequality in income distribution.

A fine policy mix of tax and transfers can significantly improve the distribution [Leubker (2011)]. Cubero and Hollar (2010) show that government can give any shape to the income distribution pattern by using tax and transfers. The nature of tax plays a very critical role in policy making. There is also a lot of discussion on the effectiveness of government spending over tax on income distribution. For example, Martinez-Vazquez (2008) and Harberger (2006) argue that fiscal adjustment based on tax system does not affect the distribution pattern.

In evaluating the impact of fiscal policy, many researchers find a visible trade-off between equity and efficiency due to which many policy makers and politicians are seen reluctant in using fiscal policy for the fair distribution of income. Bertola and Allan (1993), Dollar and Aart (2000) and Perugini and Martino (2008) discuss the trade-off issue and conclude that any change in fiscal policy requires a detailed analysis of its effect on both equity and efficiency. Alesina, and Rodrik (1984) show that the growth oriented policies are favoured by a government that concerns capitalists only and found a negative relationship between economic growth and income distribution. However, Deininger and Squire (1996) and Ravallion and Chen (1997) see no relationship between growth and inequality.

The Computable General Equilibrium (CGE) model has a distinguishing feature: it identifies the impact of any small exogenous change on the overall economic system. Adelman and Robinson (1978) and McLure (1977) argue that the general equilibrium models can assess the economic behaviour in an interesting dimension that cannot be viewed in partial equilibrium studies. On the other hand, this approach has a drawback in assuming that within-group distribution is fixed. Lofgren, *et al.* (2003) further suggest that to overcome this drawback, the households in the CGE model can be disaggregated into more sections.

In Pakistan, Iqbal and Siddique (1999) use CGE approach to analyse the impact of fiscal adjustments on income distribution. Their results show that reduction in consumption subsidies and expenditures on health and education adversely affects

[3] "Equity versus efficiency: The elusive trade-off" by J. Le Grand (1990).

income distribution. Further, Siddique and Iqbal (2001) examine the impact of tariffs on income distribution using CGE model and conclude that any reduction in tariff helps to reduce the gap between rich and poor. Kemal, *et al.* (2001) use CGE model and SAM for 1989-90 conclude that reduction in tariff affects the forces of demand and supply in the commodity market, which further worsens the distribution pattern by affecting the consumption as well as income of rich more positively than that of poor. Naqvi, *et al.* (2011) use CGE model for Pakistan to study the impact of agriculture taxes on income distribution and welfare of households and conclude that a combination of reduction in sales tax and the imposition of agriculture tax is an effective distribution policy tool.

Overall, the above literature shows that fiscal policy can play an effective role in reducing income inequality. However, in the framework of computable general equilibrium (CGE) model, the above literature ignores the deterioration in budget deficit while analysing the impact of different tools of fiscal policy on the distribution of income. In this study, we take up this issue and considering the budget deficit, investigate the impact of household income tax and subsidies on the distribution pattern using CGE framework.

3. ESTIMATION METHODOLOGY

In order to assess the impact of fiscal policy measures on income distribution, computable general equilibrium model of Pakistan (hereinafter CGEM-Pak) is used. This model is in accordance with the static model structure constructed by Lofgrenm, *et al.* (2001). The CGEM-Pak is a domestic model and it captures the economic activities of the country. This model follows the SAM[4]2001 [Dorosh, *et al.* (2006)], segregation of activities, commodities, factors and institutions. With few amendments in the model, different scenarios are presented to show the net impact of fiscal adjustments on the economy under consideration. These amendments include the desegregation of agriculture activities and services. Table 1 demonstrates the disaggregation of activities, institution, factors of production and households.

Table 1

Sets and Elements of CGEM-Pak Model

Set	Element	Disaggregation
Institutions	-	Household, Government, Entrepreneur, Rest of the world
Household	Rural	Large, medium, small and landless farmer, poor non-agricultural labour, poor non-farm labour, rich non-farm labour
	Urban	poor labour, rich labour
Activity	Agriculture	-
	Non-agriculture	Mining, Food manufacturing, yarn, Textiles, leather, Other Manufacturing.
	Services	-
Factors of Production	-	Own large farm labour, own medium farm labour, own small farm labour, agriculture wage labour, non-agriculture unskilled labour, skilled labour, large farm land, irrigated medium farm land, irrigated small farm land, non-irrigated small farm land and capital.

There are four blocks of equations in the model. (All the equations are given in Appendix in Table 4 through 7).

[4] Social Accounting Matix.

3.1.1. *Price Block*

The model is constructed with the framework that each activity produces one commodity only. Export price (PE) is calculated by multiplying commodity's producer price by exchange rate and then subtracting the export tax from it. Domestic consumers pay price of the imports to the rest of the world. They pay tariff on these imports, so import price (PM) is determined by adding the tariff in the import price. The final supply price (PX) for the domestic commodity is obtained by the interaction of producer and export price. The final supply price (PX) for the non exported commodity depends on producer price only. Composite commodity's price (PQ) is determined by adding import and domestic prices. The final market price is then determined by adding sales tax to the Composite commodity's price. The final market price of composite non-imported commodity's price depends on domestic price and sales tax. Gross revenue per activity (activity price) is calculated as

$$PA_a = \sum_{c \in C} \theta_{a,c} PX_c \quad \text{Where } \theta_{a,c} \text{ is Yield of output } c \text{ per unit of activity } a$$

Price of value added (factor income per unit of activity) is determined by subtracting the value of intermediate input from gross revenue per activity.

3.1.2. *Production and Commodity Block*

The model includes nine production activities[5] using primary and intermediate inputs. These activities collect their revenue from selling the products they produce. They then use the revenue for the purchase of the required inputs to carryout production. Eleven factors are involved in production which includes six labour types, four types of land and capital. Primarily income distribution is determined by measuring how much value added flows from the sector of production to factors of production. This distribution depends on the household's ownership of different factors of production. Households differ in skills so they get different income accordingly. Subject to constant returns to scale, the producers are assumed to maximise their profit. This implies that the factors of production receive their income, where marginal cost equals marginal revenue. Leontief technology is used to combine factors with fixed share intermediates.

Thus, the output from these activities is measured using primary factor under Cobb-Douglas function. These activities also use intermediate inputs. Model includes the foreign trade with the assumption that this trade is based on imperfect substitutability between domestic and imported goods. This substitution is governed by CET[6] function. Energy is the only product in this model which is produced and consumed domestically that is production of energy sector is neither exported nor imported. The final composite good which is the combination of imported and domestic goods is supplied to meet the final and intermediate demand.

3.1.3. *Institution Block*

Institutions obtain their income from factors of production after their involvement in the value added. Nine household groups[7] are included in the model. Income of capital

[5]Details of activities and factors of production is given in Table1.

[6]Constant elasticity of transformation.

[7]Large farm, Medium farm, Small farm, Landless farmers, Rural agriculture landless, Rural non-farm non-poor, Rural non-farm poor, Urban non-poor, Urban poor.

is distributed among the nine types of households, enterprises and government. Household's income is calculated by summing transfer payments from government, firms and rest of the world. The quantity of investment demand for commodities is calculated by multiplying base year investment demand by investment adjustment factor which is exogenous. The government sector collects income from direct and indirect taxes and also from capital ($YF_{g,f}$) and uses it on consumption expenditure and transfers to households. Both of these payments are fixed in real terms. In this model, Government's consumption for each of the commodity is exogenously fixed. Thus, the government budget surplus (GBS) is determined by subtracting government expenditures from government revenue. Entrepreneurs receive their income only from capital. Their saving is calculated as the difference between their income and expenditures. It is also assumed that they do not consume commodities. Rest of the world is taken because the model assumes open economy. Thus, country exports its product to and imports product from rest of the world.

3.1.4. *System Constrained Block*

This block contains the equations showing the constraints in the model. In factor market, the quantity of factors supplied must be equal to the sum of quantity demanded from activities and the unused supply of factor. Market of composite commodity also involves the constraint that quantity supplied must be equal to the quantity demanded. The constraint related to current account balance expressed in foreign currency imposes that there must be equality between foreign exchange earnings of the country and its spending. Finally saving of institution must be equal to the quantity of investment demand for commodities.

3.2. Model Closure

The closure presents the macroeconomic assumptions to conduct simulations which are usually done by changing the value of policy variables that are exogenous. The closure in this model assumes fixed Foreign Savings (FS) and hence a flexible exchange rate (EXR) clears the current account. For savings/investment account, savings-driven investment is assumed, therefore savings are fixed, and Investment adjustment factor (IADJ) is flexible, permitting investment to adjust. For capital market, it is assumed that capital is activity-specific and fully employed. This means that the price of capital is fixed and factor price distortion adjusts to clear the market. There are four types of land in our model[8] and all types are being used in agriculture sector, which has only one activity (agriculture). For land market, it is assumed that all types of land are fully employed and hence price of land will clear the market. There are four types of agriculture[9] and two types of non-agriculture labour[10] in the labour market of the model. They are mutually exclusive and there is no mobility of labour across these sectors. The assumption of four types of agriculture labour is that they are fully employed and hence price of labour (wage rate) will clear the market. In CGEM-Pak, non- agriculture sector has eight types of activities and each type of activity uses two types of labour (non-

[8]Large farm land, irrigated small farm land, irrigated medium farm land, non-irrigated small farm land.
[9]Own large farm labour, own medium farm labour, own small farm labour, agriculture wage labour.
[10]Skilled labour, non-agriculture unskilled labour.

agriculture labour; skilled and unskilled). Full employment is assumed for non-agriculture labour. Moreover, labour is fully mobile within the sector and a unique wage clears the labour market.

3.3. Inequality Measures

Due to the limitation of our data, only inequality between household groups is captured. To calculate inequality, Theil-L, Theil-T and Theil-S indices are used. The Range of Theil-T index from 0 (lowest inequality) to 'ln(N)' (highest inequality). Conversely, the Theil-L index ranges from 0 to infinity and the higher the value of Theil-L, the higher the inequality is. Mathematical expressions of these indexes are given in Appendix.

3.4. Data and Model Calibration

Due to some miscalculations in SAM 2007-08, it is not used in this study. This study uses the available Social Accounting Matrix (hereinafter SAM) developed by Dorosh, Niazi and Nazili (2006), for the year 2001-02 as benchmark dataset. This square matrix (SAM) reflects the receipts and payments of different transactions done by different agents of the economy and satisfies all equilibrium conditions and properties of CGEM-Pak.

3.4.1. *Structure of SAM (2001-02)*

The SAM 2001-02 consists of 5 major accounts, namely activities, commodities, factors of production and institutions and savings. Institution account includes household, enterprises, government and rest of the world. Table 2 presents the macro SAM of Pakistan for the year 2001-02. Micro SAM explains the disaggregation of accounts in macro SAM. The original SAM has many categories of agriculture and service sector as the objective was to check the impact of agriculture growth on poverty. But in this study, a modified micro SAM is used which aggregates the service and agriculture activities into only one category each because there is no need to include details of agriculture and service sectors.

Table 2

Macro SAM Pakistan 2001-02 (Million Rs)

	Activity	Commodity	Factor	Household	Govt.	Entrepreneur	Row	Saving	Total
Activity	0	22525207	0	0	0	0	0	0	12527165
Commodity	10709923	0	0	7439429	0	817880	1057903	1049023	14933492
Factor	9678120	0	0	0	0	0	0	0	5466875
Households	0	0	5711329	0	663581	33595	239097	0	4510186
Govt	0	0	1474624	0					737312
Enterprenuer	0	466741	64018	146152					429795
Row	0	1939586	0	0					1030152
Saving	0	0	0	357242	73731	-8457	167539		534109
Total	12527165	14933492	5466875	4510186	737312	429795	1030152	534109	

Source: SAM 2001-02 for Pakistan.

Given limited resources as well as data constraints, it is not possible to estimate elasticity parameters for this study. Therefore, elasticity parameters employed by Ahmed and Donoghue (2008), examining similar question have been used. These trade elasticities are shown in Table 1 in Appendix.

The model is solved primarily for equilibrium to make sure that the base year dataset is reproduced. Afterwards, we give a shock to the model by changing the value of one of the exogenous variables. The model is then re-solved for equilibrium (as before) and changes in the values of the endogenous variables. These values are then compared with the base-year equilibrium to establish the impact of exogenous shocks. The distributional impact of exogenous shocks (macro variable) is determined by the indicators, that is, Theil T, Theil L, and Theil S. At the same time, the impact of these policy measures on economic growth and other macroeconomic variables such as exports, imports, investment etc. is analysed to check the trade-off between equity and efficiency, which is supposed to be involved in the implementation of fiscal policy.

3.5. Simulation Design

Different simulations are designed to run on the model of study, CGEM-PAK. These simulation exercises are carried out by increasing or decreasing the values of suggested policy tools until the income inequality measures show a decline in inequality. For the simulation exercise any percentage number can be taken, but should be attested with various sensitivity analysis [Israel (2006)]. The proposed simulation strategies are shown in Tables 3 and 4. Simulations in Table 3 test the significance of government transfers to households, income tax and sales tax in reducing inequality without suggesting any measure to increase revenues to cover the resulting budget deficit. Simulation 1 tests the impact of an increase in government transfers to households on income distribution. As sales tax has a regressive nature, simulation 2 discusses the impact of a decrease in sales tax and simulation 3 discusses the impact of an increase in income tax with the assumption that it has a progressive nature.

Simulations in table 4 include different policy mix in order to reduce the gap between haves and have-nots by considering its impact on budget deficits. These simulations are designed in such a way that we could have a significant reduction in budget deficit. In Simulation 4, sales tax is reduced to decrease the economic burden of poor and transfers from government to households are increased to increase the welfare of households. On the other hand, the resulting deficit in budget is financed by raising income tax. Simulation 5 and 6 test the effect of different mixtures of sales tax, income tax and government expenditure on income equality and overall economy. In each of these simulations, we reduce the sales tax to correct the income distribution while to cover the resulting deficit in budget we cut the government expenditures and increase the income tax rate.

Table 3

Simulation Scenarios (Budget Deficit is Allowed to Change)

SIM	Base Scenario
1	35% increase in government transfers to households
2	6 % decrease in sales tax
3	5.81% increase in income tax

Table 4

Simulation Scenarios (Budget Deficit is Not Allowed to Increase)

SIM	Base Scenario
4	4.14% decrease in sales tax, 26.2% increase in government transfers to households and 10.25% increase in income tax.
5	3.62% cut in government expenditures, 7% reduction in sales tax and 3.65% increase in income tax
6	3.99% cut in government expenditures, 7.01% reduction in sales tax and 2.5% increase in income tax

4. RESULTS AND DISCUSSION

Results are presented in Table 5 through 8, where the negative sign with government budget surplus shows government budget deficit. GDPMP1 shows GDP from spending side at market price while GDPMP2 presents GDP from income side at market price. GDPMP1 and GDPMP2 must be equal.

4.1. Simulation Results Allowing the Change in Budget Deficit

These simulation exercises are carried out by increasing or decreasing the values of suggested policy tools until the inequality measures show a decline in inequality while we did not suggest any measure to cover the resulting deficit in budget.

4.1.1. *Government Budget Surplus, Income Distribution*

Economic policies affect income distribution through three mechanisms. Firstly, they directly affect the income of households by changing the return to primary factors. Secondly, a change in income tax or subsidies affect the disposable income of households and lastly these economic policies affects the price level thus the price effect bring changes in the household's real income. Table 5 presents results of first set of simulations. In simulation 1, the income inequality index Theil T shows a decrease in its value interpreting an improvement in income distribution. Theil T responds to variations in the upper expenditure category. This policy of increasing transfers to household causes budget deficit to increase from 8457 to 18208.037 millions in Pakistani Rupees because transfers cause an increase in expenditure and no measure has been taken to raise revenue to cover the costs. Simulation 2, in which sales tax is reduced by 6 percent, presents a similar result. The value of Theil T decreases to 0.317 but, other inequality indicators remain unchanged. A drastically negative effect on budget deficit is observed which causes 137.06 percent increase in deficit when compared to its benchmark value.

Table 5

Government Budget Surplus and Inequality

Variables	Base	SIM1	SIM2	SIM3
Government Budget Surplus	-8457	-18208.037	-20048.964	1.985
Theil T	0.318	0.317	0.317	0.318
Theil L	0.326	0.326	0.326	0.326
Theil S	0.322	0.322	0.322	0.322

Result of Simulation 3 shows that an increase of more than 5.9 percent in the income tax rate leaves an adverse effect on income distribution. In developing countries, income tax is shouldered by middle class and the tax acts are full of tax exemptions and the corruption factor makes tax evasion easy for rich.[11] In Pakistan, majority of tax payers belong to middle or upper middle income group.[12] Therefore, a 5.81 percent increase in the tax rate does not affect the income distribution pattern. At the same time, the revenue raised by income tax causes budget deficit to reduce and a surplus of Rs. 1.985 million is observed. Thus, in Pakistan's economy income tax policy fails to serve as a tool for reducing inequality.

4.1.2. *Macroeconomic Effects of Policies*

Table 6 presents the macroeconomic effects of distribution policies as discussed above. The 35 percent increase in transfers causes the GDP at factor price to decline. GDP at market prices (both from expenditure and income side) shows a decline. A little improvement in equity is achieved at the cost of 0.016 percent reduction in GDP at factor price and 0.023 percent reduction in GDP at market price. It is because the government transfers to households leave fewer funds with the private investors, therefore investment decreases that cause the economic growth to slow down. Further, investment decreases by 1.720 percent, imports by 0.23 percent, and exports by 0.29 percent. As in this simulation transfers have been made, therefore the index of net indirect tax presents a decline in its value relative to the base year that is by 0.123 percent. These transfers on the other hand induce an increase in private consumption.

Simulation 2 makes GDP at factor cost to increase by 1.32 percent because a reduction in sales tax (by affecting price) induces more consumption that causes the demand as well as output to increase. An increase in GDP is translated into more exports; raising the later by 4.816 million Rupees. While, GDP at market prices indicate a decrease in its value which confirms the tradeoff between equality and economic growth. When GDP is calculated at market prices, it includes the taxes and subsidies (taxes enter in the equation of GDP with positive and subsidies with negative signs). A decrease in sales tax reduces the GDP measured at market prices. The existing literature shows that an increase in the sales tax brings a boom in real investment,[13] thus a decrease in investment is observed. Further, government consumption, imports and private consumption also increase because reduction in sales tax causes the prices to fall and increases the purchasing power whilst decreasing the value of net indirect taxes. Moreover, reduction in sales tax induces more consumption.

Results of simulation 3 (increased by 5.81 percent) show that this policy doesn't affect the distribution pattern but cause an increase in economic growth rate. As the government's revenue from tax collection increases, more expenditure can be made thus

[11]Tapan (2006).

[12]"Contrary to claims: Tax burden grows heavier for salaried people" Report by Shahbaz Rana in *The Express Tribune.*

2. Murtaza, N (2012).

[13]1. Jorgenson, D.W. (1996), "the impact of taxing consumption," testimony before the committee on ways and means, U.S House of Representation, March 27.

2. Kotlikoff, Laurence J. (1993), "The Economic Impact of Replacing Federal Income Taxes with a Sales Tax," Cato Institute Policy Analysis No. 193, April 15.

government consumption increases. Further, this policy doesn't affect the investment decisions of investor class, the revenue raised may be used to increase the investment level and thus the exports increases by 0.24 percent while imports increase by 0.19 percent. On the other hand, increase in income tax causes disposable income to reduce so the private consumption declines by 0.23 percent.

Table 6

Macroeconomic Indicators (Change is Measured in Percentage)

Variable	BASE	SIM1	SIM2	SIM3
GDP FC	3377101.00	-0.01572	0.324203	0.01215
GDPMP1	3628735.00	-0.02314	-0.02277	0.018631
GDPMP2	3628735.00	-0.02314	-0.02277	0.018631
GOVCON	408940.000	-0.11805	0.03895	0.092421
INVESTMENT	534109.00	-1.72018	-1.5195	1.453104
EXPORTS	677841.00	-0.29434	0.000682	0.236578
IMPORTS	1.03015E6	-0.23201	0.590205	0.187351
NITAX	251634.000	-0.12274	-4.67945	0.10561
PRVCON	3037997.00	0.2775	0.236991	-0.23511

Notes: GDPFC (GDP at factor cost),GDPMP1 (GDP at market price form expenditure side), GDPMP2 (GDP at market price form income side), GOVCON (government consumption), NITAX (net indirect tax) and PRVCON (private consumption).

4.2. Simulation Results Considering Budget Deficit

Policies which address only distributional issue may cause a huge gap in revenue and expenditures. Therefore, these simulation exercises are carried out to find the policy measures which are helpful in reducing inequality while not deteriorating the existing deficit in budget.

4.2.1. *Government Budget Surplus and Income Distribution*

Table 7 shows the impact of policy mix (tax and transfers) on inequality. In Simulation 4, a decrease in sales tax and increased government transfers to households cause inequality to reduce; this is evident from a decrease in the value of Theil T. The resulting deficit in budget is covered by increasing the income tax rate. The overall increase in budget deficit is 336.255 million which is much less than what is observed in simulations 1 through 3.

Table 7

Government Budget Surplus and Inequality

Variables	Base	SIM4	SIM5	SIM6
Government Budget Surplus	–8457	–8793.255	–1.708	4.612
Theil T	0.318	0.317	0.317	0.317
Theil L	0.326	0.326	0.326	0.325
Theil S	0.322	0.322	0.321	0.321

In simulation 5, Theil T and Theil S indices of inequality indicate improvement in income distribution due to 7 percent reduction in sales tax and 3.65 percent increase in income tax. This policy reduces the budget deficit from 8457 million to 1.708 million Rupees, where 3.62 percent cut in government expenditures combined with the increase in income tax rate is used to reduce the budget deficit. Simulation 6 includes 3.99 percent cut in government expenditures, 7.01 percent reduction in sales tax and 2.5 percent increase in income tax. The distributional effect of this policy is more significant than the policy discussed in simulation 5. All the Theil indices point out a reduction in the gap between rich and poor. This simulation results in a considerable surplus of 4.612 million Rupees in the budget.

4.2.2. *Macroeconomic Effects of Policies*

Table 8 shows the macroeconomic effects of simulated policies. Simulation 4 positively affects the GDP at factor price. Reduction in sales tax affects GDP at market price positively but at the same time increase in government transfers to households offsets this positive effect, thus a slight decline in the value of GDP (at market price) is observed. The government transfers cause government consumption and private investment to increase. A decrease in sales tax causes the price of goods to decrease which results in increased demand for goods and stimulates the investment, thus increasing its level. The increase in private investment further induces an increase in the exports as well. A decrease in sales tax leaves a positive effect on income, thus private consumption and consumption of imported goods also increases. A cut in the sales tax rate reduces the net indirect taxes, and at the same time must have a positive impact on private consumption; but increase in income tax by 10.25 percent offsets this positive effect on consumption.

Table 8

Macroeconomic Indicators (Change is measured in percentage)

Variable	BASE	SIM4	SIM5	SIM6
GDP FC	3377101.00	0.233051	0.32627	0.31837
GDPMP1	3628735.00	–0.00068	–0.03687	–0.04265
GDPMP2	3628735.00	–0.00068	–0.03687	–0.04265
GOVCON	408940.000	0.101808	–3.70059	–4.10606
INVESTMENT	534109.00	0.232903	2.348692	2.385953
EXPORTS	677841.00	0.196818	0.930279	0.963261
IMPORTS	1.03015E6	0.160171	0.728049	0.752318
NITAX	251634.000	–3.13753	–4.91048	–4.88775
PRVCON	3037997.00	–0.04514	0.080368	0.122466

In simulation 5 and 6, there is an increase in the value of GDP at factor price and a decrease in the value of GDP at market price because these simulations include sales tax which causes GDP (at market price) to shrink. Further, due to a cut in the government expenditures, value of government consumption declines which helps to recover the deficit in budget caused by decrease in sales tax. On the other hand, with the decrease in

government expenditures, private investors will have enough funds to invest thus investment level increases. Increase in investment leads to more output, thus having a positive effect on exports which causes real GDP to increase. This policy involves leaves a positive effect on the income of households due to which some households switch to imports, causing an increase in level of imports. Moreover, sales tax reduction results in a decrease in the net indirect tax collection and encourages private consumption but this effect is offset by increase in income tax.

4.3. Sensitivity Analysis

In CGE models, the selection of parameters takes the paramount importance. As there is no readily available method to estimate the parameters and elasticities of the model, therefore it is important to employ sensitivity analysis to check the influence of elasticities and parameters used in the model[14]. In order to conduct the sensitivity analysis, this study uses +10 percent to –10 percent changes in the armington and export elasticity used in the model (Different combinations of these elasticities are shown in Appendix table 2). The effect of changes in these parameters on macroeconomic analysis is not significant, leading to the conclusion that results are reliable. Result of sensitivity analysis is shown in Table 3 in Appendix.

4.4. Concluding Remarks

A brief analysis of simulations 1 through 3 is presented in Table 9. Theil T is more sensitive to changes in expenditure than the other inequality indices, therefore only Theil T is shown in the table. GDP at market price is used to discuss the tradeoff issue. The positive sign with these indicators shows an increase in their value and the negative sign shows a decrease. As in simulation 3, Theil T doesn't record any change, therefore the idea of increasing income tax to solve the problem of inequality doesn't work here. Both the simulations 1 and 2 verify the existence of a strong trade-off between equity and efficiency. In simulations 1 and 2, inequality is reduced but in both the scenarios, it is observed that budget deficit increases and economic growth (GDPMP) decreases. The government budget deficit increases drastically in simulation 2. Simulation 1 shows more adverse effect on economic growth when compared to simulation 2. Thus, as cost involved in these two policies is more than the benefit, efficiency requires that these two policies should not be employed to correct the distribution pattern.

Table 9

Change in Inequality, Budget Deficit and Economic Growth

	SIM 1	SIM 2	SIM 3
Theil T	-0.001	-0.001	No change
GBD	+9751.037	+11591.964	-8455.015
GDPMP	-839.747	-826.435	+676.061
GDPFC	-530.904	+10948.648	+410.31

Note: GBD(Government budget deficit), GDPMP(GDP at market price), GDPFC (GDP at factor price).

[14] Domingues, E.P. and E.A. Haddad (2005).

Table 10 discusses the changes in inequality, budget deficit and economic growth due to policy packages discussed in simulation 4 to 6. The GDP records a positive change for all of these simulations. Except simulation 4, other simulations show a decrease in budget deficit. In simulation 4, a negative change is observed in economic growth. While in simulation 5, equality is achieved with Rs 8455.292 million reductions in the deficit and at the cost 1337.978 million decrease in GDP. In simulation 6, GDP decreases more than what is recorded in simulation 5.

Table 10

Change in Inequality, Budget Deficit and Economic Growth

	SIM 4	SIM 5	SIM 6
Theil T	–0.001	–0.001	–0.001
GBD	+336.255	–8455.292	–8461.612
GDP MP	–24.751	–1337.978	–1547.577
GDP FC	+7870.352	+11018.461	+10751.664

On the basis of above discussions, we can conclude that among budget deficit and economic growth if we are more concerned towards budget deficit then simulation 5 presents the best policy package to overcome inequality whereas simulation 4 is favourable only if we want equality with minimum efficiency cost together with a little positive change in budget deficit.

5. CONCLUSION AND POLICY IMPLICATION

This study aims at analysing the role of fiscal policy in reducing budget deficit, alleviating poverty and redistribution of income fairly. Like other developing countries, a fall in income of Pakistan accompanied by high budget deficits, corruption and political unrest causes a widening gap between the rich and poor. This study, using CGEM-Pak model, shows that fiscal instruments have a potential role in correcting income distribution. It is found that the use of sales tax or transfers alone can affect income distribution but it causes the budget deficit to deteriorate. Thus, it is concluded that a mix of fiscal instruments can have a positive effect on income distribution, GDP at factor cost, and budget surplus, while GDP at market price shows a slight decline. As in the current scenario, the focus of politicians and economists is to reduce the financial dependency, therefore among simulation 4 and 5, simulation 5 (3.62 percent cut in government expenditures, 7 percent reduction in sales tax and 3.65 percent increase in income tax) is the best possible policy to reduce the increasing inequality.

It is important to note here that government policies implemented to remove income inequality need a strong political will and support to promote progressive scales in income tax and to reduce the government expenditures particularly the non-development expenditures so that the reduction in sales tax could be made possible. A responsive government is needed to have a proper check and balance to make sure the implementation of policies in their true sense. Thus, a corruption free economy and good governance are needed to get the desirable outcomes from these policies.

There are some limitations of this research. Like most of the CGE models, CGEM-Pak is a comparative-static model, that is, the results are interpreted as "the condition expected to happen in the future after the specific policy is undertaken, compared with the situation without the adaptation of policy". Thus, the future research should use Dynamic CGE model which traces each variable through time. Secondly, due to limitation of data, only between household inequalities can be determined, while within group inequalities are not possible to find here. We can overcome this problem by disaggregating the households into more groups while making SAM.

APPENDIX

Table 1

Trade Elasticity's

Commodities	Armington Elasticity	CET Elasticity
C-AGRI	4.0	4.0
C-MINE	3.0	3.0
C-FMAN	3.5	3.0
C-YARN	3.2	3.0
C-TEXT	3.5	3.0
C-LEAT	3.5	3.0
C-MANF	3.2	3.0
C-ENRG	3.0	3.0
C-SER	2.7	2.0

Table 2

Simulation Parameters for Sensitivity Analysis

Experiment	Change in Elasticity
S0	Original Armington and CET elasticity's
S1	10% increase in Armington elasticity
S2	10% increase in CET elasticity
S3	10% decrease in Armington elasticity
S4	10% decrease in CET elasticity
S5	10% increase in Armington and CET elasticity
S6	10% decrease in Armington and CET elasticity
S7	10% increase in Armington and 10% decrease in CET elasticity
S8	10% decrease in Armington and 10% increase in CET elasticity

Table 3

Effect of Sensitivity Experiments on National income Accounts (% Change from Base)

Variables	S0	S1	S2	S3	S4	S5	S6	S7	S8
GDPFC	5.106	5.103	5.09	5.101	5.106	5.098	5.105	5.103	5.099
GDPGAP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
GDPMP1	–0.32	–0.33	–0.329	–0.339	–0.329	–0.321	–0.337	–0.32	–0.338
GDPMP2	–0.32	–0.33	–0.329	–0.339	–0.329	–0.321	–0.337	–0.32	–0.338
GOVCON	1.08	1.51	1.08	0.58	1.07	1.50	0.5 0	1.50	0.6 0
INVEST	–5.30	–4.90	–5.60	–5.80	–4.90	–5.10	–5.70	–4.50	–6.00
EXP	11.5	15.1	12.3	6.84	10.4	16.6	6.60	12.9	7.00
IMP	8.9	11.6	9.2	5.32	8.47	12.4	5.40	10.5	8.30
NITAX	–18	–18	–19	–19	–18	–19	–19	–17	–19
PRVCON	1.26	1.38	1.28	1.13	1.20	1.40	1.10	1.30	1.10

Table 4

Parameters

Parameter	Definition
ad_a	Activity parameter of production function
aq_c	Shift parameter of Armington function
ax_c	Shift parameter for output transformation (CET) function
$cwts_c$	Weight of commodity c in the CPI
$Ir_{c,a}$	Quantity of c as intermediate input per unit of activity a
$Shry_{i,f}$	Share for institutions i in income of factor f
$\alpha_{f,a}$	Value added share for factor f in activity a
$\beta_{c,h}$	Share of consumption spending of household h on commodity c
δq_c	Share parameter for the composite good
δx_c	Share parameter for output transformation
$\theta_{a,c}$	Yield of output c per unit of activity a
ρq_c	Exponent of Armington function
ρx_c	Exponent used in the CES aggregation function
σq_c	Elasticity of transformation for composite goods
σx_c	Elasticity of transformation for output transformation.

Table 5

Exogenous Variables

Variable	Definition
CPI	Consumer price index
INV_c	Base year investment demand
$MPSIN_h$	Initial marginal propensity to consume
$MPSDUM_h$	0–1 dummy: 1= for those H that saving changes, 0 otherwise
MPS_h	Marginal propensity to save for household h
PWE_c	World price of exports (Foreign currency units)
PWM_c	World price of imports (Foreign currency units)
QFS_f	Supply of factor f
QG_c	Quantity of consumption of commodity c by government g.
te_c	Sales tax on imports
tm_c	Import tariff rate
tq_c	Rate of sales tax
$TR_{i,j}$	Transfers from institution j to institution i
$TSTAX_c$	Total sales tax on commodity c
$TTAR_c$	Total tariff on commodity c
ty_h	Household income tax rate

Table 6

Endogenous Variables

Variable	Definition	No.
$CPIH_h$	Consumer price index of household h	9
EH_h	Consumption expenditure of household h	9
EXR	Foreign exchange rate as domestic currency per unit of foreign currency	1
$FPD_{f,a}$	Factor price distortion for factor f in activity a	99
FS	Balance of payment (foreign currency units)	1
GBS	Government budget surplus	1
$IADJ$	Investment adjustment factor	1
PA_a	Gross revenue per activity (activity price)	9
PD_c	Domestic price of domestic output	9
PE_c	Domestic price of exported good	8
PF_f	Rate of return to factor f	11
PM_c	Domestic price of imported goods (local-currency unit),	8
PQ_c	Composite price of commodity c	9
PVA_a	Price of value added (factor income per unit of activity)	9
PX_c	Commodity price of producer c for activity a	9
QA_a	Quantity (level) of activity a	9
QD_c	Domestic sales quantity	9
QE_c	Supply of exports	8
$QF_{f,a}$	Quantity demanded of factor f from activity a	99
QFU_f	Unused supply of factors f	11
$QH_{c,h}$	Quantity consumed of commodity c by household h	81
$QINT_{c,a}$	Quantity of commodity c as intermediate input coefficient	81
$QINV_c$	Quantity of investment demand for commodity c	9
QM_c	Quantity of imported commodities	8
QQ_c	Quantity of goods supplied to domestic market (composite supply)	9
QX_c	Aggregate quantity of domestic output of commodity	9
UH_h	Utility of household h	9
$WALR$	Dummy variable	1
$YFRM$	Income of enterprise	1
$YFRMTS$	Total saving of enterprise	1
$YF_{h,f}$	Transfers of factor income to household	99
$YF_{s,f}$	Transfer of factor income to firms	11
YH_h	Income of household h	9
μ_h	Weight of utility of household h	9

Table 7

Equations Price Block

	Equation	Domain	
1	$PM_c = (1+tm_c)\,PWM_c\,EXR$	$c \in CM$	8
2	$PE_c = PWE_c(1-te_c)\,EXR$	$c \in CE$	8
3	$PQ_c\,QQ_c = (PD_c\,QD_c + PM_c\,QM_c)(1+tq_c)$	$c \in CM$	8
4	$PQ_c\,QQ_c = PD_c\,QD_c(1+tq_c)$	$c \in CNM$	1 R
5	$PX_c\,QX_c = PD_c\,QD_c + PE_c\,QE_c$	$c \in CE$	8
6	$PX_c\,QX_c = PD_c\,QD_c$	$c \in CNE$	1 R
7	$PA_a = \sum_{c \in C} \theta_{a,c}\,PX_c$	$a \in A$	9
8	$PVA_a = PA_a - \sum_{c \in C} ir_{c,a}\,PQ_c$	$a \in A$	9

Production Block

9	$QA_a = ad_a \prod_f QF_{f,a}^{\alpha_{f,a}}$	$a \in A$	9
10	$FPD_{f,a}\,PF_f = (\alpha_{f,a}\,PVA_a\,QA_a)/QF_{f,a}$	$f \in F$, $a \in A$	99
11	$QINT_{c,a} = ir_{c,a}\,QA_a$	$a \in A$, $c \in C$	81
12	$QX_c = \sum_{a \in A} \theta_{a,c}\,QA_a$	$c \in C$	9
13	$QX_c = ax_c[(1-\delta x_c)QD_c^{\rho x_c} + \delta x_c\,QE_c^{\rho x_c}]^{1/\rho x_c}$	$c \in CE$	8
14	$QX_c = QD_c$	$c \in CNE$	1
15	$QQ_c = aq_c[(1-\delta q_c)\,QD_c^{-\rho q_c} + \delta q_c\,QM_c^{-\rho q_c}]^{-1/\rho q_c}$	$c \in CM$	8
16	$QQ_c = QD_c$	$c \in CNM$	1
17	$QM_c/QD_c = [(\delta q_c/1-\delta q_c)(PD_c/PM_c)]^{\sigma q_c}$, $\sigma q_c = 1/(1+\rho q_c) > 0$	$c \in CM$	8
18	$QD_c/QE_c = [(\delta x_c/1-\delta x_c)(PD_c/PE_c)]^{\sigma x_c}$, $\sigma x_c = 1/(\rho x_c - 1) > 0$	$c \in CE$	8

Institution Block

19	$YF_{i,f} = shry_{i,f} \sum_{a \in A} FPD_{f,a} PF_f QF_{f,a};$	$i \in I,$ $f \in F$	99
20	$YH_h = \sum_{f \in F} YF_{h,f} + TR_{h,g}\, CPI + EXR \cdot TR_{h,r} + TR_{h,s}$	$h \in H$	9
21	$HTS = \sum_h MPS_h (1 - ty_h) YH_h$		1
22	$HDS = HTS - \sum_h TR_{h,r} \cdot EXR$		1
23	$MPS_h = MPSIN_h (1 + MPSADJ \cdot MPSDUM_h)$		9
24	$UH_h = \prod_c \left(\frac{QH_{c,h}}{\beta_{c,h}} \right)^{\beta_{c,h}}$	$h \in H$	9
25	$QH_{c,h} = \frac{\beta_{c,h} EH_h}{PQ_c}$	$h \in H,$ $c \in C$	81
26	$EH_h = (1 - MPS_h)(1 - ty_h) YH_h$	$h \in H$	9
27	$CPIH_h = \prod_c PQ_c^{\beta_{c,h}}$	$h \in H$	9
28	$CPI = \sum_h \mu_h \cdot CPIH_h$		1
29	$\mu_h = \frac{UH_h}{\sum_h UH_h}$	$h \in H$	9
30	$QINV_c = INV_c\, IADJ$	$c \in C$	9
31	$GBS = \sum_{h \in H} ty_h YH_h + EXR \cdot TR_{g,r} + \sum_{c \in C} tq_c PD_c QD_c + \sum_{c \in CM} tq_c PM_c QM_c + YF_{g,f} + \sum_{c \in CM} tm_c EXR \cdot PWM_c QM_c + \sum_{c \in CM} te_c EXR \cdot PWE_c QE_c - \left[\left(TR_{s,g} + \sum_{h \in H} TR_{h,g} \right) CPI + \sum_{c \in C} PQ_c QG_c \right]$		1
32	$YFRM = YF_{s,k}$	$s \in I$	1
33	$YFRMTS = YF_{s,k} - TR_{h,s}$		1

System Constraint Block

34	$\sum_{a\in A} QF_{f,a} + QFU_f = QFS_f$	$f \in F$	11
35	$QQ_c = \sum_{a\in A} QINT_{c,a} + \sum_{h\in H} QH_{c,h} + QG_c + QINV_c$	$c \in C$	9
36	$FS + \sum_{c\in CE} PWE_c QE_c + \sum_{i\in I} TR_{i,r} = \sum_{c\in CM} PWM_c QM + \sum_{i\in I} TR_{r,i}$		1
37	$WALR = \left[\sum_{h\in H} MPS_h(1-ty_h)YH_h + YFRMTS + GBS + EXR \cdot BOP \right] - \sum_{c\in C} PQ_c QINV_c$		1

REFERENCES

Adelman, I. and Robinson, S. (1978). Income Distribution Policy in Developing Country: A Case Study of Korea. Stanford CA: Stanford University Press.

Ahmed, V. and D. Cathal'O. (2008) Welfare Impact of External Balance in Pakistan: CGE-Microsimulation Analysis. Planning Commission of Pakistan.

Alesina, A. and R. Dani (1984) Distributive Politics and Economic Growth. *Quarterly Journal of Economics* 109:2, 465–490.

Armington, P. S. (1969) A Theory of Demand for Products Distinguished by Place of Production. *International Monetary Fund Staff Papers* 16, 159–176.

Bertola, G. and D. Allan (1993) Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity. *American Economic Review* 83, 1170–88.

Cheema, A. A. and M. H. Malik (1985) Changes in Consumption Patterns and Employment under Alternative Income Distribution in Pakistan. *The Pakistan Development Review*, 24:1, 1–22.

Chen, S. and M Ravallion (1997) What Can New Survey Data Tell Us about Recent Changes in Distribution and Poverty? *The World Bank Economic Review* 11:2, 357–382.

Cubero, R. and I. Hollar (2010) Equity and Fiscal Policy: The Income Distribution Effects of Taxation and Social Spending in Central America. (IMF Working Paper WP/10/112).

Deininger, K. and Lyn Squire (1996) A New Data Set Measuring Income Inequality. *World Bank Economic Review* 10:3, 565–91.

Dollar, David and K. Aart (2000) Growth is Good for the Poor. *Journal of Economic Growth* 7, 195–225.

Domingues, E. P. and E. A. Haddad (2005) Sensitivity Analysis in Computable General Equilibrium Models: An Application for the Regional Effects of the Free Trade Area of the Americas (FTAA). *Brazilian Review of Econometrics* 25:1, 115–137.

Dorosh, Niazi, and Nazili (2006) A Social Accounting Matrix for Pakistan, 2001-02: Methodology and Results, Pakistan Institute of Development Economics. (Research Report Series).

Harberger, Arnold C. (2006) Corporate Tax Incidence: Reflections on What is Known, Unknown and Unknowable. In John W. Diamond and George R. Zodrow (eds.) *Fundamental Tax Reform: Issues, Choices, and Implications.* Cambridge: MIT Press.

Iqbal, Zafar and Rizwana Siddiqui (1999) The Impact of Structural Adjustment on Income Distribution in Pakistan A SAM-based Analysis. *The Pakistan Development Review* 37:4, 377–397.

Israel, E. (2006) Analysis of Economic Growth, Income Distribution and Poverty in Ethiopia using Computable General Equilibrium Model, MS Thesis, Addis Ababa University.

Kemal, A. R., M. Irfan, and G.M. Arif (2001). MIMAP Synthesis Report: Major Conclusions and Policy Implications. Pakistan Institute of Development Economics, Islamabad, Pakistan. (MIMAP Technical Papers Series No. 3).

Kemal, A. R., Rizwana Siddiqui, and Rehana Siddiqui (2001) Tariff Reduction and Income Distribution: A CGE-based Analysis for Urban and Rural Households in Pakistan. (MIMAP Technical Paper Series No. 11).

Khandkar, R. (1973) Distribution of Income and Wealth in Pakistan. *The Pakistan Development Review* Spring 1973.

Lofgren, H., R.Harris, and S. Robinson, M. Thomas, and M. El-Said (2001). A Standard CGE Model in GAMS. International Food Policy Research Institute (IFPRI). Washington, D.C. (TMD Discussion Paper No. 75).

Mahmood, Zafar (1984) Income Inequality in Pakistan. *The Pakistan Development Review* 23, 365–376.

Malik, M. H. and N. Saqib (1985) Who bear s the Federal Taxes in Pakistan. *The Pakistan Development Review* 24:3 and 4 (Autumn–Winter).

Martinez-Vazquez, Jorge (2008) The Impact of Budgets on the Poor: Tax and Expenditure Benefit Incidence Analysis, in Blanca Moreno-Dobson and Quentin Wodon, eds., Public Finance for Poverty Reduction: Concepts and Case Studies from Africa and Latin America. Washington, D.C.: The World Bank.

McLure, C. E. Jr. (1977) The Incidence of Jamaican Taxes 1971-1972. Institute of Social and Economic Research. University of the West Indies, Mona. Jamaica. (Working Paper No.16).

Murtaza, N. (2012) Over-burdened Society, Over-politicised State: Understanding Pakistan's Struggles with Governance. *Asian Journal of Social Science* 40:3, 321–341.

Naqvi, A. H, M. T. Masood, and A. N. Rashid (2012) Impact of Structural Adjustment Programme on Household Welfare and Inequality-Pakistan: A Case-in-point for the Developing Countries. *Journal of Management Research* ISSN 1941-899X.

Perugini, C. and G. Martino (2008) Income Inequality within European Regions: Determinants and Effects on Growth. *Review of Income and Wealth* 54:3, 373–406.

Pyatt, G. (1988). A SAM Approach to Modelling. *Journal of Policy Modelling*, 10:3, 327–352.

Siddiqui, R. and I. Zafar (2001). Tariff Reduction and Functional Income Distribution in Pakistan: A CGE Model. Pakistan Institute of Development Economics Islamabad, Pakistan, Micro Impact of Macroeconomic Adjustment Policies (MIMAP) Technical Paper No. 10, Islamabad, Pakistan.

Suleman, R. M. U. (1973). Employment, Income Distribution and Social Justice: An Analysis of Distribution of Personal Income in West Pakistan. Paper presented to the 16th Annual, All Pakistan Economic conference, Islamabad February 18-20.

Tapan, K.S (2006) Who Bears the Burden of Taxes in Developing Countries? A Case of Income Taxation in Bangladesh. *Pakistan Economic and Social Review* 44:2, 181–207.

Comments

The paper titled "Fiscal Policy and its Role in Reducing Income Inequality: A CGE Analysis for Pakistan" is an excellent and systematic effort to explore the relationship in the shocks to Fiscal policy on the income inequality for Pakistan. Rather it presents solution to a million $ question of improving equity and efficiency of the economy while maintain the fiscal balance.

However the following are some of my comments which the authors may like to consider before the final submission of their papers:

(i) I will comment in a reverse order, and the authors have also recognised it at the end of the paper. The limitations of the methodology. It is a static estimation method. Does not take into account the behavioural changes which might occur because of the regime change. Especially in the present case since Fiscal policy is under consideration, so essentially we are talking about regime changes with each possible strategy. The CGE model has rigid assumptions such as constant return to scale in the production block. Another example is less substitution among the imported and export goods where as the case me opposite especially with the enactment of WTO. Fixed foreign savings leading to an assumed flexible exchange rate regime, where as actually foreign savings are very vulnerable especially for the developing countries. Finally the robustness tests for the results from this technique may be questionable and an empirical issue.

(ii) Statements need qualifications, page 1, "...this persistent deficit is the constant source of increasing poverty and deterioration of income inequality in Pakistan".

(iii) Sales tax being regressive for Pakistan seems not to be the case.

(iv) If the model presented in the paper here is an adopted one then simply give reference instead of giving all the details. If the authors have added something to it than that can be explained in the paper. In that case please also provide some descriptive statistics.

(v) The SAM used for this paper is of 2001-02, 13 years old, definitely needs an upgrade before any policy oriented results could be interpreted. Why couldn't the available latest SAM not used needs some reasons.

(vi) The parameter values (such as external sector elasticities) are not for Pakistan, so author should be very care full in selecting the appropriate parameters. Assumption such as no change in fiscal deficit could be more rational if it is linked with the FRDLL-2005 value.

(vii) Table 3.2 on structure of Macro SAM, just a wild thought that in the column for government can we also add other transfer payments to enterprises such as rebates, tax charges and in the commodity column against government can we include surcharges as it is one of the major source of revenues for Pakistan, lastly also add PSEs, Provincial revenues/expenditures?

(viii) Deficit financing methods and such reforms implementation have a cost which needs to be part of the system.

(ix) The results for transfer payments are a bit skeptical, especially with the modus operandi in vogue. E.g. wheat subsidy is identified to be benefiting just 6 percent of the poor households, similarly the electricity subsidy is uniform across the board etc.

(x) Further any tax increase may not result in the same proportion at which it was earlier (Tax Laffer curve), so that may be mentioned as a short coming of the model.

(xi) In the macroeconomic effects section 35 percent increase in transfer causes the GDP at factor prices to be reduced. Put some economics with every result.

(xii) For the macroeconomic indicators tables please give the percentages as the actual figures does not offer much orientation.

(xiii) In the sensitivity analysis a 50 percent +- is on the higher side.

(xiv) Other possibilities of change in tax and expenditures where say inequality is kept constant and efficiency has increase or vice versa may also be considered as there could be a number of iterations.

(xv) Can we compare the simulation based exercise with those which are resulting because of a natural experiment (robustness).

The paper makes an interesting case and presents the results in accordance with the theoretical understanding. Over all the paper is a good contribution to the existing knowledge on the subject.

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