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Macroeconomic Dynamics of Standard of Living in South Asia

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Abstract

Purpose - The study explores social well-being of the community of five selected countries of the South Asia: India, Pakistan, Sri Lanka, Nepal and Bangladesh. The study compares effectiveness of macroeconomic policies across the countries through interactive effects of the macroeconomic policy variables with the regional dummy variables.

Research design, data, and methodology - Using the data set for the period of 1990-2008, this study employs panel data models, quantile regression methods, and the fixed effects method, which the constant is treated as group or country-specific. The model can also be known as the least-squares dummy variables estimator.

Results - The results reveal significant chances of improvement in the well-being of the people while living in India and Pakistan as compared to the other countries of the region where India relatively stands with better chances of providing opportunities to improve the well-being of the people.

Conclusions - This study recommends an increasing allocation of budget on education and health in order to enhance social well-being in the South Asian region. Inflation is the main cause of deteriorating well-being of the South Asian community by escalating the cost of living. Comprehensive study is recommended by employing the micro data models in the region.

Keywords : Well-Being, South Asia, Macroeconomic Factors, Regional Dummies.

JEL Classifications : E30, E60, H52, H53, O53, O57

1. Introduction

According to the Millennium Development Goals (MDG's), poverty is a multi-dimensional concept. Core of discussion regarding poverty is income earned by households in order to meet their daily needs. Sen (1976) describes various dimensions of poverty. According to this study, level of well-being can be termed as a way of measuring poverty. Well-being is the ability to function in the society in order to achieve the objectives of doings. Per capita income is one of the sources to determine the level of well-being of households. Per capita income is a material source of measuring poverty. There are various measures of poverty but the focus of current study is to analyze macroeconomic factors affecting standard of living in five countries such as Pakistan, India, Bangladesh, Nepal and Sri Lanka representing South Asian Association for Regional Cooperation, SAARC- countries.

The macroeconomic factors, considered for this study, include growth rate of per capita GDP (GRPC), growth in gross domestic product (GDPG), Human Development Index (HDI), openness index (OPI), GDP Deflator (GDPD), public expenditure on education as percent of GDP (PEDUG) and public expenditure on health as percent of GDP (PEHG). This study contemplates Panel Data and Quantile Regression Models to investigate the effect of independent variables on growth rate of per capita GDP for the period of 1990-2008. The choice of these models is attributed to their minimum requirements of the stringent assumptions leading to the efficient values of the coefficients (Koenker and Bassett, 1978 Baltagi, 2005, p. 171). We could not find any study employing the Quantile Regression Model in Pakistan in the studies related to the SAARC. This way, current study may be considered as an academic contribution in investigating macroeconomic determinants of well-being of the SAARC community.

The current study also employs regional dummies of the 5 SAARC countries such as Pakistan, India, Bangladesh, Nepal and Sri Lanka in order to capture the regional effect on the well-being of the SAARC community. Additionally, present study finds interactive effect of the regional dummy variables with the macroeconomic variables such as inflation (INF), openness (OPI), human development index (HDI), public sector expenditures on health as percent of GDP (PEHG), public sector expenditures on education as percent of GDP (PEDUG) and growth in gross domestic product (GDPG) on the well-being of the SAARC community. The interactive effect in terms of dummy variables is calculated to clearly identify the countries where macroeconomic policy variables are playing significant role in the determination of well-being of the SAARC community. The interactive effects of the variables also compare the 5 countries in terms of well-being of the community.

Rest of the paper is organized as follows. Section 2 of the study builds theoretical framework based on the review of previous studies. Section 3 briefs about the econometric methodology and sections 4

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and 5 respectively analyze and conclude the results and findings of the study.

2. Literature Review

This section of the study presents brief review of literature related to the well-being and macroeconomic variables affecting directly and indirectly well-being. The studies have conducted across various countries of the world.

Slaughter (2001) explores the role of trade liberalization in the determination of per capita income. The study contemplates convergence of per capita income across the countries because of trade liberalization. He employs the differences and differences approach in order to compare liberalization policies of different OECD and European countries. The study finds no significant systematic relationship between trade liberalization and convergence of per capita income across the countries. Rather trade liberalization has caused divergence of income which resulted more income inequalities in many countries. Verhoeven et al. (2008) examine changing effects of determinants of income on market transition in Check Republic (Hungary, Poland, Slovakia) for the period of 1991-2002. The study tests extent to which trends in the effects of income determinants converges across post communist society. The study employs 61 cross-sectional surveys for 5 Central and Eastern countries using weighted Least Squared regression analysis. Findings of the study reveal significant importance of education on personal income. Years of experiences, private sector employment and gender do not seem to have notable impact on increasing income in these countries.

Balli et al (2011) contemplated determinants of insurance income through foreign asset revenues and foreign liability payments. The study is an invaluable contribution in economic modeling. According to the study, factor income is closely affected by net financial inflows to the OECD countries. The study also compares net financial inflows with factor income. Factor income outflows create output shocks (Balli et al, 2011). Jansen et al (2006) examine the determinants of income earning strategies in the Hillside community of Honduras. The study is based on participatory diagnostic survey conducted in 95 rural communities in the Hillside of Honduras. The study identifies the determinants of income and analyzes the adoption of conservation practices. Comparative advantages between communities were found because of earning strategies. Multinomial Logit model employed by the study includes bio-physical, economic, social and institutional variables. The writers also incorporate population density, market access and organizational variables in their Probit model. Some very important policy implications have been identified in this study. The study recommends significant investment in infrastructure in the Hillside area to enhance income earning opportunities. The study also points out the role of public health, education, electricity, community facilities and other services in determination of income earning opportunities.

Sharp et al (2011) investigates two sector Malthusian models with agriculture and industry for identification of determinants of income in the UK. The study very interestingly considers children and consumption of goods as gross substitutes. The study finds no significant role of productivity of agriculture sector in increasing equilibrium income. The study supports growth productivity in industrial sector as one of the main sources of income growth. An extended data was employed by this study which supports both the hypothesis. Raphael et al (2005) investigate income and income distribution as determinants of health in Canada. The study emphasizes reducing the gap between theory and practices. 241 Canadian research studies on income and health have been considered in this study. There are three main steps of the study. At the first step, conceptualization of income and its proxies are constructed. Secondly, theoretical foundations have been developed and lastly, income distribution measures and health measures are developed. The study identifies poor conceptualization of income and the way it influences the health as an indicator of social well-being. The study also identifies a problem that there is little interdisciplinary research, mediating income and health relationships.

Matteo (2005) explores macro determinants of health expenditure in USA and Canada. The study evaluates the impact of income, age, distribution and time on health related expenses. The study employs state level data for USA for the period of 1980 to 1998 and Canadian Province level data for the period of 1975-2000. According to the study, ageing population and income explains a relatively small portion of health expenditure as per findings of the study. Time has been employed in the study as a proxy variable for technological change. The study reveals significant impact of increasing age on the health related expenses. The relationship is however, found nonlinear. Moĉnick and Ŝirec (2010) conducts cross country empirical analysis of the determinants of internet use controlling for income level. This study explains the intensity of internet use as a source of information in relation with the level of income. The study employs socio economic indicators such as investment, international trade, education and distribution of population. Using factor analysis, three most important actors are extracted as determinants of internet usage. The strongest of them and the most significant impact on internet use is infrastructure of communication and capabilities of the people. The other factors as determinants of internet usage are international trade, volume of investment and income distribution. The data set of the study proves its hypothesis that size of the impact differs across income groups. The use of internet services can be considered as one of the indicators of social well-being.

Another study investigates the relationship between income and health using parametric and non parametric panel data models. The study identifies misspecification and unobservable heterogeneity in the model employed by the previous studies. Non parametric or semi parametric models do not require stringent assumptions of normality. The results of Jones and Wildman (2008) are robust across the range of techniques. The parametric results of the study largely reject influence of income and its proxy variable of health whereas the results of semi parametric model reveal evidence of income effect on health. The relationship between health and income is found nonlinear. Yuniz –NAUDE and Taylor (2001) has studied the effects of education on choice of activities and incomes of rural Mexican households. The study explores various income sources and education of rural households. Main findings of the study are in favor of increasing

nonfarm income and employment of the households rather than choice of activities. This is due to an increase in rural education and development policies as per findings of this study.

Beverly and Sherraden (1999) employ three traditional and emerging theories of saving, consumption and income in USA. According to the study, the theories of neoclassical economists, psychological and sociological theories and behavioral theories are at different stages of development. They empirically found positive effects of asset accumulation on income which is a source of social well-being. This empirical study addresses attitude of low income people towards savings and significance of policies to promote savings among low income groups. They employ institutional variables related to income and saving behavior. The study also identifies financial sources and discouraging access of low income households to the institutional sources of funding. This way, the study has developed a cyclical relationship among income, savings and institutional variables. Yu et al (2011) explore the effects of foreign direct investment (FDI) on China's regional income distribution. According to this study, income inequality is widening in different regions of China since 1990. The study attributes this inequality towards FDI, in addition to the regional inequalities. The study has employed simultaneous equation model and its results reveal only 20% contribution of FDI towards regional income inequality. Income equality in China has been declined since 2002. Main factors contributing to income inequality are education level, province location and asset accumulation in different region of China.

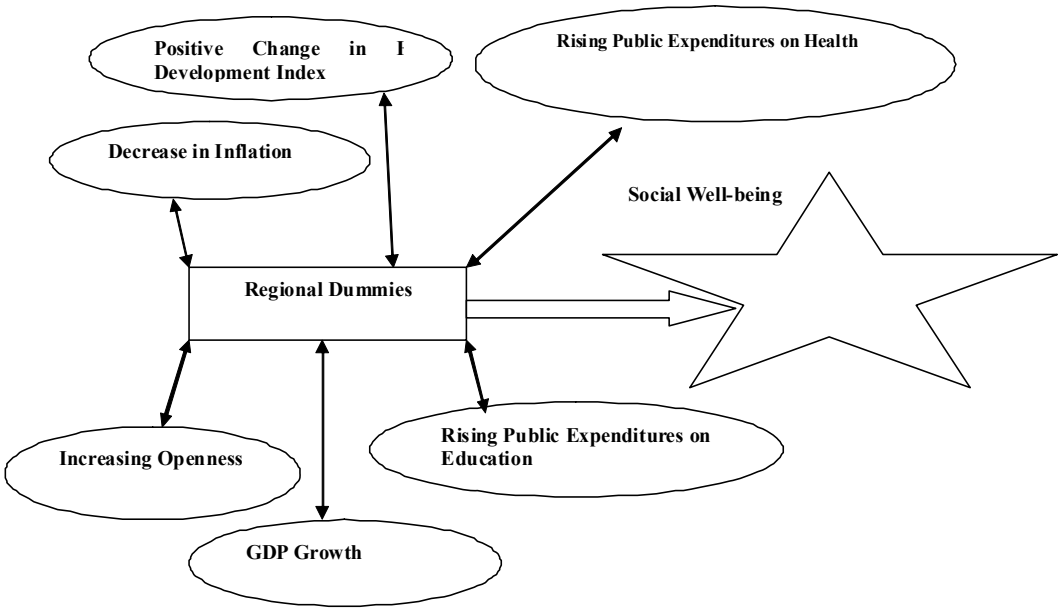
Almonacid (2003) examines various determinants of income and output by employing synthesis of Keynesian and Neoclassical views. The study deals with one of the oldest problems in macroeconomics-the business cycle and fluctuation of output and price level. Additionally, this paper also looks into real business cycle literature. The study examines how demand and supply fluctuations evolve through time after exogenous demand side shocks. The study borrows old Keynesian idea of static equilibrium and employs tools of macroeconomic dynamics. Additionally, the study also borrows Freidman's idea of money in determination of macroeconomic equilibrium. Keplan et al (2008) study association between socio economic indicators and sources of income. They employ data of 29 years (1965-1994) from Alameda Country Study. In order to study the association between average income, income changes, and profits and benefit income, the study addresses purposes in life, self acceptance, personal growth and environmental autonomy as a measuring scale of psychological well-beings. Main findings emanate that income is strongly associated with all the scales of psychological well-beings.

Conte et al (1998) analyze economic determinants of income maintenance problem using Maryland Forecasting Model. The study develops a forecasting model for the families with dependent children based on economic theory by including measures of the size of population at risk, job availability and families with dependent children relative to families with working status. Findings of the study are used to state the budget projection. According to the study, the ability of model for forecasting is profound. Their results indicate that economic variables, especially low paid working female dominated jobs in industries are important determinants of families with dependent children. Kim and Hinderson (2005) analyzed inflation targeting income growth. The study compares optimal and simple interest rate rules in the monopolistic markets and labor markets. According to this study, the relationship between inflation and nominal income is suboptimal and this sub optimality is due to partial information.

Summary

Findings of the previous studies can be summarized as follows:

- The relationship between income growth and inflation is suboptimal as compared to the relationship of income with other macroeconomic variables (Kim and Hinderson, 2005).
- There is significant role of the family size in the determination of growth in income (Conte et al., 1998)
- There is relationship of socio-economic factors and the level of income as a measure of well-being (Keplan et al., 2008).
- Keynesian model of income determination which is the static concept of income equilibrium (Almonacid, 2003). Similarly there are studies which employ Malthusian model as determinant of income level (Sharp et al., 2011).
- Foreign direct investment plays a mixed role in the determination of income an income inequality (YU et al., 2011).
- There is cyclical relationship of saving, consumption and income (Beverly and Sherraden, 1999).
- Thereis a role of education in the determination of income level but the significance of the education in the determination of income growth (Yuniz–NAUDE and Taylor, 2001).
- There is relationship between income and the health. The higher the income the better the well-being measured in terms of health facilities (Jones and Wildman, 2008). Studies (Matteo, 2005 Raphael et al., 2005) have also discussed determinants of health facilities assuming access to health as the social well-being.
- Some of the studies have also used access to internet facilities as one of the indicators of well-being (Moĉnick and Ŝirec, 2010).
- Studies related to the Eastern Europe have focused transition related variables and determinants of income and the welfare levels (Verhoeven et al., 2008).
- Slaughter (2001) explores the role of trade liberalization in the determination of per capita income.



<Figure 1> Theoretical Framework

3. Methodology[1)]

Panel data models and Quantile regression methods are getting popularity in the studies related to the cross-section entities. These methods are the most recent and efficient analytical methods in handling cross-sectional data with panels. Such an efficient methodology allows researchers to includedata for a number of cross-sections. Additionally panel data methodology provides more efficient estimation of parameters incorporating broader sources of variation. They are also appropriate for the study of the dynamic behaviour of the parameters[2)].

Depending upon the nature and type of data sets following three different methods are employed:

(a) Common constants;

(b) Allowing for fixed effects, and

(c) Allowing for random effects.

Homogeneity of the data set is key assumption for common constant. The assumption meansno difference among the data matrices of the cross-sectional dimension which in turn means estimation of common constant for all cross-sections. For all the five members of SAARC, there is common constant in this study. Consequently there is no difference between the estimated cross-sections.

In the fixed effects method the constant is treated as group or country-specific and there is a different constant for each country. The model can also be known as the least-squares dummy variables (LSDV) estimator. Dummy variable allows researchers to take different group-specific estimates for each of the constants for every country.

Problems associated with fixed effects model are:

- It ignores the variables with least variation over time. Hence, dummy variables cannot be added to this model.
- It can be inefficient at times using degree of freedom by estimating many parameters in the model.
- Slowly changing variables may be highly collinear with the effects.

These limitations have been especially taken care of in order to ensure convenient estimation of the models. All the regional dummies have been employed in the common constant pooled data models. Diagnostic tests such as cross-section as weights and AR (1) are employed to control heteroskedasticity and autocorrelation in the models of interactive effects presented in the Table 5. Redundant fixed effects tests are employed to make choice between the results of the two models of pooled and fixed effects. On account of the limited number of cross-section entities the random effects methods are not considered for this study.

The macroeconomic factors, considered for this study, include growth rate of per capita GDP (GRPC), growth in gross domestic product (GDPG), Human Development Index (HDI), openness index (OPI), GDP Deflator (GDPD)to find inflationary rate, public expenditure on education as percent of GDP (PEDUG) and public expenditure on health as percent of GDP (PEHG). This study contemplates Panel Data Model and Quantile Regression Model to explore the effect of independent variables on growth rate in per capita GDP for the period of 1990-2008. Very few studies have employed the interactive effects of macroeconomic variables and regional dummies to determine the level of well-being of the community. This way, current study may be considered as a step not only to investigating academic debates on dynamics of macroeconomic model related to SAARC member countries but also interactive effects provide comparison of the effectiveness of macroeconomic policy measures taken in the line of improving well-being of community across 5 leading members of the SAARC and the South Asia.

1) Methodology has been adapted from Asteriou (2006).

2) For more details please refer to the section of methodology.

4. Findings of the Study

Poverty is a multi-dimensional concept. Income earned by the households is one of the sources to reduce poverty. Per capita GDP is one of the indicators of well-being in any economy. The current study has employed growth in per capita income of the 5 leading SAARC countries as an indicator of well-being of the SAARC community. Amertya Sen (1976) described various dimensions of poverty. According to this study, the level of well-being can be termed as a way of measuring poverty. Well-being is the ability to function in the society in order to achieve the objectives of doings. Per capita income is a material source of measuring poverty. Focus of the current study is to analyze dynamically macroeconomic factors affecting standard of living in the five countries such as Pakistan, India, Bangladesh, Nepal and Sri Lanka representing South Asian Association for Regional Cooperation, SAARC- countries. On account of non availability of the balanced data set the other members of the SAARC are not accounted for this study.

The methodologies employed in this study are the most recent and efficient tools in handling econometric issues of efficiency of the estimated coefficients. Panel Data Models provide efficient estimation of parameters by considering broader source of variation and results reveal better information to analysts than other econometric methodologies. The results also allow the study of dynamic behavior of parameters. Additionally, panel studies are extensive way of testing statistical sample by successfully answering the issues related to causality. Thus results of the panel models outperform other time series methods[3)]

The models are tested at three stages.

1. Common constants
   - ➢ With cross sectional weights
   - ➢ With period weights
   - ➢ With interactive regional dummies and the macroeconomic determinants of well-being measured by growth in per capita GDP.
2. Fixed Effects Model
3. Quantile Regression

The results have been organized in the tables for perusal. In Table 1, results of common constants for pooled data set have been arranged using cross sectional weights in order to control the problem of heteroskedasticity across the panels of five countries. GDP growth (GDPG) was found to have significant impact on the growth rate of GDP per capita at less than 1% level of significance. Theoretically, GDPG and growth of per capita income (GRPC)go hand in hand. That is main factor to have positive and significance relation between GDPG and GRPC.

Human development index (HDI) is one of the important indicators to gauge socio-economic standard in the economy. HDI has got the true sign of positive effect on growth rate of per capita GDP. Surprisingly, statistical significance could not be achieved for human development index on GRPC. Theoretically, GDP deflator (GDPD) is a measure of growth in general price level. Much to our surprise to get positive effects of GDPD on GRPC in five SAARC countries but the results were not so significant. Possible justification for positive relation can be that GDPD reveals rising economic activities leading to rising factor cost which subsequently leads to the inflationary pressure in the economy.

<Table 1> Pooled Results Assuming GRPC as the Dependant Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.547962	1.029470	-2.475023	0.0153
BANG	1.239582	0.509688	2.432042	0.0171
GDPG	0.926052	0.052787	17.54310	0.0000
HDI	0.189081	2.201320	0.085894	0.9318
IND	1.340941	0.465312	2.881812	0.0050
GDPD	0.002064	0.027658	0.074638	0.9407
NEPAL	0.358028	0.487112	0.735000	0.4644
OPI	0.044146	0.020314	2.173198	0.0326
PEDUG	-0.370235	0.218374	-1.695419	0.0937
PEHG	-0.172975	0.417111	-0.414699	0.6794
SRI	-0.596144	0.532465	-1.119592	0.2661

Weighted Statistics

R-squared	0.861521	Mean dependent var	3.412819
Adjusted R-squared	0.845035	S.D. dependent var	2.179172
S.E. of regression	0.878616	Sum squared resid	64.84514
F-statistic	52.25892	Durbin-Watson stat	1.821594
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.856826	Mean dependent var	3.330526
Sum squared resid	67.04346	Durbin-Watson stat	1.821722

With the emergence of globalization, the developing economies are trying to catch up with the developed countries with the reduction of their tariffs, custom duties and non-tariff barriers. Every economy is endeavoring at its best level to enhanceopenness. Openness is also a challenge to the economies like SAARC where production capacity of the trade oriented industries is yet to be enhanced. SAARC countries considered for this study seem to have improved their GRPC through an extended openness. Openness index has got significant impact on GRPC at 3.2 % level of significance which is much less than the standardized value of 5%. The results are presented in the Table 1 for perusal. The time weighted results presented in the Table 2 make no difference except the openness index variable which is not turned up affecting well-being significantly. The coefficients of regional dummies for all the 4 countries have relatively better values than the intercept term representing Pakistan. Nevertheless, statistically only India and Bangladesh have got significant coefficient values indicating better well-being of the residents of these two countries than the other countries of the South Asia. The results can be viewed from the

3) See Asterio; chapter-10

Tables 1 and 2.

The results presented in the Table 2 are improved when time-weights are incorporated in order to control the heteroskedasticity across time periods. The results remain unchanged in terms of significance of the determinants of the poverty measured as growth in per capita income of the SAARC. However, overall significance of the results improves with increased value of R2 from 86% to 94%.

<Table 2> Time Weighted Results of the Pooled Data

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.103047	0.681571	-4.552784	0.0000
BANG	0.958855	0.327533	2.927505	0.0044
GDPG	0.927155	0.035784	25.90956	0.0000
HDI	2.023514	1.357368	1.490763	0.1398
IND	1.000049	0.252228	3.964862	0.0002
GDPD	-0.020805	0.020946	-0.993262	0.3234
NEPAL	0.405065	0.318190	1.273028	0.2065
OPI	0.020213	0.013555	1.491172	0.1397
PEDUG	-0.110708	0.109662	-1.009540	0.3156
PEHG	-0.301800	0.264193	-1.142348	0.2566
SRI	0.059006	0.381289	0.154754	0.8774

Weighted Statistics

R-squared	0.947491	Mean dependent var	5.363901
Adjusted R-squared	0.941240	S.D. dependent var	4.579243
S.E. of regression	0.844304	Sum squared resid	59.87935
F-statistic	151.5733	Durbin-Watson stat	1.692065
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.940131	Mean dependent var	3.330526
Sum squared resid	68.27321	Durbin-Watson stat	1.822329

The panel results based on cross-section weights are presented in the Table 3 by excluding the regional dummies. Gross national product and allocation of budget on the education is found to have significant effect on the per capita income in the region generally. The negative effect of per capita expenditures on education on the per capita income growth may be attributed to the fact that educational budget is not significantly contributing towards increasing income of the people of the 5 SAARC countries considered in this study. The value of R2 exceeding 83% proves overall significance of the regression results.

<Table 3> Fixed Effects Model with Cross-Sectional Weights

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.845794	0.692964	-2.663623	0.0092
GDPD	-0.022364	0.027209	-0.821926	0.4133
GDPG	0.967655	0.051939	18.63071	0.0000
HDI	1.141350	1.245302	0.916525	0.3619
OPI	0.006607	0.008578	0.770219	0.4432
PEDUG	-0.241093	0.140451	-1.716566	0.0896
PEHG	0.006492	0.354123	0.018331	0.9854

Weighted Statistics

R-squared	0.846722	Mean dependent var	3.404931
Adjusted R-squared	0.836272	S.D. dependent var	2.145116
S.E. of regression	0.903578	Sum squared resid	71.84788
F-statistic	81.02029	Durbin-Watson stat	1.734799
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.838992	Mean dependent var	3.330526
Sum squared resid	75.47156	Durbin-Watson stat	1.703455

4.1. Comparison of Fixed and Pooled Results

The redundant fixed effects test is applied to compare the pooled and fixed effects models. The test results presented in the Table 4 tilt in favor of the fixed effects model.

<Table 4> Redundant Fixed Effects Tests

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.856295	(4,84)	0.0285
Cross-section Chi-square	12.114940	4	0.0165

4.1.1. Interactive Effects of Regional and Macroeconomic Variables

This section of the paper covers inter-country comparison of well-being of the community living in these countries using the regional dummies for the four countries using Pakistan as the intercept term-the benchmark. The pooled data results are presented in the second column of the Table 5. At the second stage interactive effects of the macroeconomic variables such as Openness Index (OPI), Growth of Gross Domestic Product (GDPG), Human Development Index (HDI), Growth in Public Sector Expenditures on Education as proportion of GDP (PEDUG) and Growth in Public Sector Expenditures on Health as proportion of GDP (PEHG) with regional dummies are calculated. The results are presented in the Table 5 with their t-statistics in the parentheses.

The interactive effects of the macroeconomic variables are calculated to see the significance of the macroeconomic policies of the SAARC countries in raising the standard of the living measured in terms of growth in per capita GDP in these countries. The results also compare the 5 countries in terms of effectiveness of their macroeconomic policies. The t-statistics with double asterisks show statistical significance at less than 5% level of significance, whereas single asterisk shows significance at less than 10% level of significance.

The results presented in the second column of the Table 5 reveal significant chances of improvement in the well-being of the community while living in India and Pakistanas compared to the other countries of the region.From between the two countries India relatively stands better chances of providing opportunities to improve the well-being of the people. That clearly speaks out the economic achievements of the Indian Economy in the region of South Asia. Although the values of coefficients of Bangladesh and Sri Lanka are better than Pakistan but statistically significance is not proved.

4.1.2. Significance of Openness in the Region

The results of interactive effects are presented in the column 3 of the Table 5. Openness has significantly improved standard of living in the South Asia except Nepal where the results are not statistically significant. Globalization seems to have worked positively in the South Asia. Openness opens the avenues for the nations in terms of relatively more exports and imports. This way size of the economies also increase and consumption bundle of the consumers improve leading to the improvement of well-being of the people of these countries.

4.1.3. Significance of GDP Growth in the Region

GDP growth is one of the sources to raise the per capita income in the region. That is perhaps the reason to observe significant effect of growth in GDP on the well-being of the people in the region. All the countries have got statistically significant values for this variable as shown in the column 4 of the Table 5.

4.1.4. Significance of HDI and Inflation in the Region

Human Development Index contributed in a better way towards the improvement of the well-being of the people in the region except Nepal. HDI and growth in per capita GDP are found to have positive correlation. On the other hand inflationary pressure has negatively affected the well-being of the people in the region except Pakistan where this coefficient has got positive sign. Further research is needed to explore the reasons in details as to the wrong sign of the coefficient of inflation. Apparently there has been miscalculation of data and data-mongering related to the GDP of Pakistan.

4.1.5. Significance of Expenditures on Health and Education in the Region

The expenditures on the health have played significant role in improving the standard of living in the region rather than expenditures in the education sector. Education has played its role in India and Pakistan to improve the well-being of the community through raising the per capita income of the people. Education improves productivity of the literate people and provides them with better opportunities of earning.

<Table 5> Interactive Effects of Regional and Macroeconomic Variables

Variables	Only Region	Region with OPI	Region with GDPG	Region with HDI	Region with INF	Region with PEDUG	Region with PEHG
Pakistan	2.5006 (3.9098)**	2.2079 (6.5104)**	-0.7664 (-1.7936)*	2.0104 (3.6463)**	3.9084 (9.2702)**	2.6906 (4.4306)**	2.3751 (4.4536)**
Bangladesh	3.6182 (1.5632)	2.3242 (4.3856)**	0.0054 (8.3547)**	5.5827 (2.8605)**	3.8386 (-1.4116)	3.1693 (1.4661)	4.0922 (2.3250)**
India	4.8623 (2.4564)**	2.3265 (5.4512)**	0.0894 (8.8464)**	7.3623 (3.5752)**	3.9097 (0.0105)	3.2202 (1.9355)*	4.7519 (2.7835)**
Nepal	1.7342 (-0.8296)	2.1971 (-0.7887)	0.0363 (7.8622)**	1.1873 (-0.4937)	3.8051 (-1.0151)	2.3736 (-1.2037)	1.6530 (-1.3151)
Sri_lanka	3.7772 (1.3896)	2.2339 (2.8673)**	0.0326 (8.4690)**	4.4857 (2.2000)**	3.7968 (-1.5457)	3.2034 (1.1308)	3.5048 (1.7519)*

4.2. Quantile Regression Results

Usually the regression models are concerned with analyzing the conditional mean of a dependent variable. In this study different aspects of the conditional distribution are considered. Quantile regression models the quantiles of the dependent variable (GRPC) for the given set of conditioning variables. This regression model is proposed by Koenker and Bassett (1978). The quantile regression provides estimates of the linear relationship between regressors and a specified quantile of the dependent variable (GRPC). The current study estimates a special case of quantile regression which is known

as least absolute deviations (LAD) estimator employing the conditional median of the response variable. The results are presented in the Table 6 for perusal. Quantile regression does not require strong distributional assumptions; rather it offers a distributional robust method of modeling relationship of variables.

<Table 6> Quantile Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.496502	0.742250	-3.363424	0.0011
GDPD	-0.023509	0.042965	-0.547169	0.5856
GDPG	0.991393	0.038116	26.01017	0.0000
HDI	2.257154	1.144975	1.971356	0.0518
OPI	-0.001654	0.008597	-0.192332	0.8479
PEDUG	-0.119989	0.108088	-1.110106	0.2700
PEHG	0.029832	0.307866	0.096899	0.9230

Pseudo R-squared	0.659686	Mean dependent var	3.330526
Adjusted R-squared	0.636483	S.D. dependent var	2.094119
S.E. of regression	0.943626	Objective	26.69764
Quantile dependent var	3.700000	Restr. objective	78.45000
Sparsity	1.489799	Quasi-LR statistic	277.9025
Prob(Quasi-LR stat)	0.000000		

The results make difference from the findings reported earlier. In the pursuit of goals in line with the Millennium Development report (MDG's), SAARC countries were supposed to increase their public expenditure on education and health as a percentage of GDP. The statistical results reveal quite dissatisfaction and depict negative elasticity of public expenditure on education to per capita GDP. Same negative trend has been followed by the public expenditure on health as a percentage of GDP and Growth rate in per capita GDP.

5. Conclusions

Social well-being has been of significance in the human history. The studies have employed various indicators and determinants of social well-being in various countries across the world. The present study picks up the variables such as growth in GDP (GDPG), human development index (HDI), openness index of the countries (OPI), public expenditures on health and education as percent of GDP (PEHG) and (PEDUG) respectively, and regional dummies of the countries for the analysis of social well-being in the 5 SAARC member countries.

Mentionable contribution of this study is in terms of its coverage of inter-country comparison of well-being of the people living in India, Pakistan, Sri Lanka, Nepal and Bangladesh using the regional dummies for the four countries and assuming Pakistan as a reference group. Another contribution of the study is interactive effects of the macroeconomic variables such as Openness Index (OPI), Growth of Gross Domestic Product (GDPG), Human Development Index (HDI), Growth in Public Sector Expenditures on Education as proportion of GDP (PEDUG) and Growth in Public Sector Expenditures on Health as proportion of GDP (PEHG) with regional dummies.

The study also compares the 5 countries in terms of effectiveness of their macroeconomic policies. The results reveal significant chances of improvement in the well-being of the people while living in India and Pakistan as compared to the other countries of the region where India relatively stands with better chances of providing opportunities to improve the well-being of the people. That clearly speaks out the economic achievements of the Indian Economy in the region of South Asia.

Openness has significantly improved standard of living in the South Asia except Nepal where the results are not statistically significant. Globalization seems to have worked in the positive direction of the South Asia. Openness opens the avenues for the nations in terms of relatively more exports and imports size of the economies increases in terms of volume of transactions and well-being of the people in the region improves. Findings of the study support Slaughter (2001). GDP growth has been one of the sources to raise the per capita income in the region. The study also finds positive correlation between HDI and growth of per capita income. Findings are in accordance with Keplan et al (2008). On the other hand inflationary pressure has negatively affected the well-being of the people in the region. Findings match with Kim and Hinderson (2005). Expenditures on the health have played significant role in improving the standard of living in the region rather than expenditures in the education sector. Education has played its role in India and Pakistan to improve the well-being of the community through raising the per capita income of the people. Findings in terms of effectiveness of education and health on welfare are in accordance with Yuniz–NAUDE and Taylor (2001).Our study is different from the previous studies in respect of methodology, as we have employed the econometric methodology with minimum requirement of stringent assumptions. None of the previous studies has employed the methodology of cross effects of regional dummies with macroeconomic indicators.

In terms of policy perspective this study recommends an increasing allocation of budget on education and health in order to enhance social well-being in the South Asian region. Inflation is the main cause of deteriorating well-being of the South Asian community by escalating the cost of living. Policy makers should take serious notice of rising inflation. Comprehensive study is recommended by employing the micro data models in the region.

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