

SORTING OUT SYNERGY AMONG INEQUALITY, REDISTRIBUTION AND ECONOMIC GROWTH: RECENT EVIDENCE FROM SELECTED ASIAN COUNTRIES

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ABSTRACT

A persistent increase in income inequality has raised concerns about its potential impact on economic performance of developing countries and at the same time it brings up the need for redistribution of income. This study is an attempt to explore this contrivance. The study uses data of twelve Asian developing countries for the period 1996-2013. Seemingly Unrelated Regression technique has been used for estimation purposes. The results of the study reveal that income inequality has negative impact on economic growth, while redistribution effects economic growth positively. The study finds the existence of inverse bidirectional causality between: inequality and growth; redistribution and inequality; however there is unidirectional causality observed between redistribution and economic growth which runs from redistribution to economic growth. The study suggests that better redistribution policies for reducing inequality and enhancing economic growth need to be formulated and implemented in these countries for economic prosperity.

Keywords: *Inequality, Redistribution, Economic growth, Seemingly unrelated regression, Asia*

JEL classification: C3, D3, D63, O4

1) INTRODUCTION

Control of income disparity, economic progress and achievement of prosperity are the most significant social and economic objectives of developing economies. The objective of limiting income inequality is much related to philosophical thoughts of justice, humanitarianism, and equality of humanity. Rawls (1971) stresses that economies must obligate rational egalitarianism of opportunities and empowering each inhabitant to achieve his own aims. Furthermore, the goal of restraining inequality can be related to the supply of certain level of income safety that is assured by the state.

The researchers and social scientists are concerned with the process by which income inequality is generated and how it reproduces itself overtime. The association between economic progress and income disparity has gained the attention of the researchers after the pioneering work of Kuznets (1955) in which he presented the process in which an economy passes through a structural change which leads to income inequity. The shape of income inequality appears to be inverse U shaped, *i.e.* income inequality first increases and then goes down as workers move from low-productivity crop to high-productivity manufacturing. Several studies are available in the literature which throws light on the relationship between inequality and economic growth (see for example, Persson and Tabellini, 1994; Bertola, 1993; Perotti, 1992, 1993; Alesina and Perotti, 1994; Alesina and Rodrik, 1994). These studies analyze the linkage between market-produced income inequality and the magnitude of redistribution. Most of the studies provide evidence and supports the opinion that inequality barricades economic growth at least over the medium tenure. While, some studies point out that income inequality has strong negative impact on economic growth over the long run period (see for example, Alesina and Rodrik, 1994; Perotti, 1996; Persson and Tabellini, 1996). This brings up that disparity is related with leisureliness and less sturdy economic growth. However there are some studies that reached at different conclusion (see for example, Forbes, 2000; Banerjee and Duflo, 2003). Some other studies find abstruse short-run associations between income inequality and economic growth (see for example, Aghion *et al.*, 1999; Oechslinet *et al.*, 2010).

Prosperous countries play a significant role in reducing income inequality by reallocating income (Brady, 2003). Most of the studies point out that

redistribution built on economic outcomes, for instance on gained capital or income, decreases marginal benefits of attaining wealth resulting in lesser enticements, which impedes economic growth. Okun (1975) names it 'big trade-off' which may be well thought out to be the main issue for the prosperous economies (see for example, Pierson and Castles, 2006; Sapir, 2006). In the literature of political economy the outcomes of income inequality on economic progress has been discussed minutely which stresses that income inequality may have an impact on economic growth which may result in more social havoc.

Keeping in view the above discussion it can be concluded that income inequality does not have negative impact on economic growth alone but also several policies which are used for reducing income inequality are responsible for adverse impact on the smooth process of economic growth. No doubt, equality is supposed to be the driver of rapid and sustainable economic growth but it does not itself do anything to redistribute. Income inequality may hamper economic growth, at least in part due to the reason that it demands efforts to redistribute with the help of fiscal policies and these efforts themselves may hamper economic growth. Some studies point out that government spending on infrastructure, health, education, and social insurance facility can be at the same time pro-growth and pro-equality and on the other hand spending on other functions may result in tradeoff between economic growth and equality (see for example, Bleaney, Gemmell and Kneller, 2001; Benabou, 2000, 2002). But it does not mean that income redistribution retards economic growth.

Not many studies are available in the literature which analyzes the inter-linkages between economic growth, income inequality and redistribution at the same time. Some studies bring up the impact of income inequality on economic growth and ignore the redistribution of income and its impact on economic growth. While on the other hand some studies throw light on the relationship between redistribution and economic growth and do not take into account the possible effects of redistribution on income inequality.

The present study is an attempt to analyze whether equality promoting interferences would consistently result in a loss of economic efficiency as rumored by Okun and others. For this purpose the study investigates the impact of income inequality on economic growth and influence of

economic growth on income inequality and to bridge the gap in the literature by examining the relationship between economic growth and income inequality on one hand and redistribution on the other hand using seemingly unrelated regressions (SUR). The results of the study may be helpful for policy makers for formulating and implementing policies which do not increase income inequality. This study is organized as follows. Following the introduction, section II depicts scenario of income inequality, redistribution economic growth and other variables in selected Asian developing countries. Section III presents the review of literature. Section IV describes the theoretical framework. Section V presents data and model specification and conceptual framework. Section VI presents interpretation of the results and section VII concludes the study.

2) SCENARIO OF INCOME INEQUALITY, REDISTRIBUTION ECONOMIC GROWTH AND OTHER VARIABLES IN SELECTED ASIAN DEVELOPING COUNTRIES

The details of the data set for different variables are presented in Table 1¹ which shows that the average inequality fluctuates from 39.2 to 40.3 in the entire range, *i.e.* from 1996 to 2013. For a greater number of years the maximum inequality remains in India, following Philippine for some years and Malaysia for one year. Minimum inequality is observed in Korea for the larger period of time following Pakistan for some years. Average redistribution remains floating between 3.2 and 2.2, with maximum redistribution remains in Pakistan for a larger number of years following Singapore which has maximum redistribution for couple of years along with Iran, Korea, Philippine and Thailand for one year each. However interestingly there has been lowest redistribution in India throughout the time span under study.

Average per capita income keep on rising starting from 4563.3 \$ to 7589.7 \$ during 1996-2013. The maximum per capita income remains in Singapore for the entire time period and it remains minimum for Bangladesh over the entire range as well. Average inflation ranges from 4.43 to 13.61. Maximum inflation is found in Turkey for a longer period of time following Iran for some years, Pakistan, Bangladesh and Sri Lanka also have highest inflation among the countries under consideration.

¹See Appendix

Minimum inflation is observed in Singapore for the larger number of years following Korea for some years; Thailand and Malaysia also have lowest inflation for almost couple of years each.

Average governance scores fluctuate between 0.50 and 0.64 over the time period under consideration. Highest scores of governance are observed in Singapore for almost whole time period under consideration besides Korea for couple of years. Minimum scores of governance are found in Bangladesh for the larger time span following Thailand, Indonesia for some years and Pakistan for one year. Average public spending on health remains between 1.48 and 2.18 percent of GDP with highest public spending on health by Turkey over almost entire range with only exception Korea for two years. Lowest public spending on health is found in Pakistan for a larger number of years under study, following Indonesia for three years.

Average old age dependency ratio decreases from 62.75 in 1996 to 48.24 in 2013. Maximum old age dependency is observed in Pakistan throughout the time period under study however it goes on dwindling from 88.47 in 1996 to 61.82 in 2013. Trade openness remains fluctuating from minimum 87.7 to highest 113.41. Maximum trade openness is found in Singapore over almost entire range of study only exception of Malaysia for just one year while minimum trade openness remains in India from 1996 to 2003 and after that it remains lowest in Pakistan, *i.e.* from 2004 to 2013.

3) LITERATURE REVIEW

Not much literature is available which analyzes the impact of income inequality, redistribution and economic growth simultaneously. Existing studies throw light on the impact of income inequality on economic growth but fail to take into account the redistributive system. On the other hand, some studies investigate the effects of redistribution in general do not take into account possible effects of income inequality. Furthermore, the results of the empirical work are mixed in terms of the relationship between income inequality, economic growth and redistribution.

Clarke (1992) examines the relationship between income disparity and economic growth of seventy economies for the period of 1970-88. Study uses various proxies for measuring income inequality like income coefficient, Gini coefficient and Theil index. All measures of income

inequality show an inverse relationship between income inequality and economic growth in whole sample of study. Galor and Zeira (1993) find the impact of wealth and income distribution on economic growth across countries. The results of the study show that distribution of wealth effects both economic growth and the pattern of external shocks in the short-run and long-run. The study brings up that economic growth is affected by preliminary dissemination of wealth which helps in investing in human resources.

Persson and Tabellini (1994) point out association between income disparity and economic growth of nine developed economies (Denmark, Finland, Norway, Germany, Sweden, Austria, Netherlands, the United States and the United Kingdom) for two different time periods, 1830-1850 and 1970-1985. The study explores a noteworthy and inverse link between income dissimilarity and growth for all economies. Deininger and Squire (1998) analyze relationship between income dissimilarity and economic performances of sixty developed and twenty-seven developing economies for the period 1960-92. Using Income Gini coefficient and land Gini coefficient as proxy for income inequality the study finds significant inverse relationship between income inequality and economic performances of developed and developing economies. The study points out that this relationship becomes insignificant after the inclusion of regional dummies in regression equation.

Milanovic (2000) tests the hypothesis of an inverse association between dissimilarity in diffusion of factor income and redistribution which means larger income dissimilarity is connected with lower economic growth. The study uses political collective-choice mechanism through the median-voter hypothesis for 24 economies. The results of the study provide a strong and robust support for the redistribution hypothesis.

Castello and Domenech (2001) analyze the relationship between human resource disparity and economic growth for a comprehensive panel of economies. The study uses cross country data of 108 economies for the period 1960 - 2000 on human resource disparity and comes up with two conclusions. First, most economies in the world have inclined to lessen the disparity in human resource distribution. Second, measures of human resource disparity deliver more robust outcomes than income inequality measures.

Gyimah (2002) analyzes the relationship among corruption, economic growth and income differences in African countries by using panel data and by applying GMM estimator. The study stresses that corruption reduces economic growth directly and indirectly through decreased investment in physical capital. The results of the study indicate that augmented level of corruption is positively associated with income difference. The mutual effects of reduced income growth and increased disparity recommend that corruption hurts the deprived more than the rich in African countries. Panizza (2002) explores the relationship between income variation and economic performances of forty eight USA states for the period 1940-1980. The study uses Gini coefficient and income share of the third quintile as proxies of income inequality for analysis purpose and concludes that no significant relationship exists between income variation and economic performances.

Pagano (2004) finds empirical relationship between income inequality and economic growth for forty developing and developed economies covering the period from 1950 to 1990. The results of the study find positive association between income disparity and economic performance in developed economies and inverse relationship for developing economies. Rehman *et al.* (2008) try to explore the elements accountable for income inequality among the dissimilar clusters of economies at different stages of economic growth. The study tests the Kuznet's hypothesis with economic growth and financial development by splitting panel of economies into four sub-panels; low income, lower middle income, upper income and higher income economies. The study concludes that economic growth increase income inequality in all panels excluding higher income countries. The results reveal that there is a feeble indication of the presence of inverted U-shaped hypothesis for income growth in all economies and inverse relationship between financial expansion and income inequality regardless of phase of economic enlargement. The study points out that fiscal consumptions, trade openness and literacy rate are the main factors which are accommodating in plummeting income differences in low income, lower middle income and upper middle income economies. The study suggests that for reducing income inequality government of these economies should pay much emphasis to increase the literacy rate and develop guidelines for hovering trade openness and public sector expenditures.

Gakuru and Mathenge(2012) investigate the level of income variation in Kenya and its inferences on several poverty lessening strategies by using multiplier simulation model. The study analyzes the associations among demand side shocks, economic growth, income cohorts and income dissemination for dissimilar economic groups. The results of the study reveal that due to high income variations in Kenya, the pace of economic development increases but helps rich urban families rather poor class of rural sector. The study suggests that agriculture has higher direct effects on the income of rural families as compare to urban families.

Cheema and Sial (2012) attempt to determine long-run interactions among poverty, irregular pattern of income dissemination and growth using fixed effect model using pooled data from eight household income and expenditure surveys conducted between 1992/93 and 2007/08. The results of the study show that growth and disparity of income play an important role in affecting the configuration of poverty, and that the effect of the anterior was considerably greater than that of the subsequent. Moreover, growth has momentous and optimistic impact on income discrepancy. Furthermore, the study points out that coefficient of net growth elasticity of poverty is lesser than that of gross growth elasticity of poverty, which means that some of the growth effect on poverty is counterpoised by the upsurge in variation of income. The investigation at a regional level demonstrates that both the gross and net growth elasticity of poverty are higher in rural zones than in urban zones, whereas the inequality elasticity of poverty is larger in urban areas than in rural. The study suggests that for reducing poverty government should implement strategies which have impact on growth and also on income dissemination.

Assa (2012) analyzes the association between income differences and economic performance of 141 economies of the world for the period 1998-2008. For econometric analysis the study uses Income Gini coefficient as proxy for income inequality. The results of the study indicate that income differences have negative and significant impact on economic performance of developing economies while the results of developed economies appeared to be insignificant.

Chotikapanich*etal.* (2014) attempt to investigate the trend of income distribution and poverty in eleven Asian developing countries. The study concludes that some reduction in poverty is observed in the countries

included in the sample over time. Castells and Royuela (2014) bring up various factors through which income variation stimulates growth and also highlights adverse as well as optimistic effects of income dissemination on economic growth. The study finds that social conflicts, political instability, population pressure and low aggregate demand are the major factors through which income inequality reduces economic growth in the long-run.

4) THEORETICAL FRAMEWORK

Income inequality can effect economic growth both positively and negatively through different channels: first one is that income inequality may have positive impact on economic growth due to the fact that higher inequality can motivate people to work hard and to put some additional efforts due to high reward in egalitarian economy. Empirical evidence shows that relative incomes are important for perceived welfare (Gruen and Klasen, 2008). Rooth and Stenberg (2012) find that income inequality in Sweden has positive impact on economic growth. Mahy *et al.* (2011) explain that within companies, a higher wage inequality can increase productivity. The subsequent conduit by which income inequality can increase economic growth is based on the positive impact of income inequality on savings. If the people in higher income brackets possess greater marginal propensities to save and saving and investment rates are positively related, then more unequal societies will have a higher steady-state growth rate (Castello, 2010; Kaldor, 1957). In this way, a more unequal society will have a higher output growth. However, a more unequal society is only beneficial to growth when low income classes have relatively low propensity to save.

Similarly income inequality can effect economic growth negatively due to two major reasons. The first one is that more unequal societies may be less socially and politically stable. Unequal economies may experience more violent protests, ethnic tensions, and social polarization, which can lessen the safety of assets and eventually, depress investment which decreases economic output (Keefer and Knack 2002). These factors may be less important in advanced states due to well-protected property rights (Barro, 2008). Second point of view is that income inequality can retard economic growth through its effects on human capital. This line of reasoning predicts a negative effect of income inequality on economic growth by decreasing the stock of human capital. People not having

sufficient financial resources are unable to invest in human capital that retard overall stock of knowledge and eventually reduces economic growth. This negative effect of inequality through the human capital channel may be more imperative (Galor and Moav, 2004).

It is not only the level of inequality that might affect economic growth, but also the policies that are under taken for redistribution (Goudswaard and Caminada, 2010). As per trade-off argument (between redistribution and economic growth) the adjustment of market outcomes by public redistribution, motivates individuals to amend their actions by lessening fiscal inducements to gain individual wealth, leading to a lesser overall economic growth (Allegrezza *et al.*, 2004).

Furthermore, it is argued that provision of unemployment assistance by the public sector make the people to work less and depend on government which leads to an increase in unemployment. Empirical evidence relating to trade-off hypothesis on macro level is mixed.

Romer and Romer (2010) find that one percent increase in exogenous tax, depresses growth with 2.5 per cent. On the contrary, Lindert (2004) points out that the welfare state is a free lunch. Other argument concentrates on the purported lesser utility of public allocation of recourses. Reallocation of resources increases transaction costs, as appropriately taken by Okun's (1975) symbol of leaking bucket which must ensure the flow of money from the rich to the poor. More or less of it will simply vanish in the transit; the poor may not obtain all the money that is taken from the rich. Government policies that redistribute may enhance growth by protecting against threats like unemployment, disabilities and old age which market may be unable to provide efficiently (Boadway and Keen, 2000). Lastly, redistribution might enhance growth by decreasing income inequality. There can be reverse causality in case where economic growth enhances the need and demand for distribution. In situation of a positive income elasticity of demand for social spending, a better-off country will be keener to publicly procuring indemnities against unemployment, sickness, or on pensions, normally stated to as Wagner's law (Meltzer and Richard, 1983). Secondly, in a system with automatic stabilizers, larger disparity due to economic disaster gives rise to further redistribution (Immervoll and Richardson, 2011). Furthermore societies may adopt short-run policies to counter to economic slumps, which are usually

planned to encourage employment and this enhances redistribution (Chung and Thewissen, 2011).

5) DATA AND MODEL SPECIFICATION AND CONCEPTUAL FRAMEWORK

The data has been taken from World Development Indicator (WDI), Quality of Government Basic Data set by university of Gothenburg, Standardized World Income Inequality Database (SWIID version 5) for the period 1996 to 2013 for twelve Asian developing countries.²

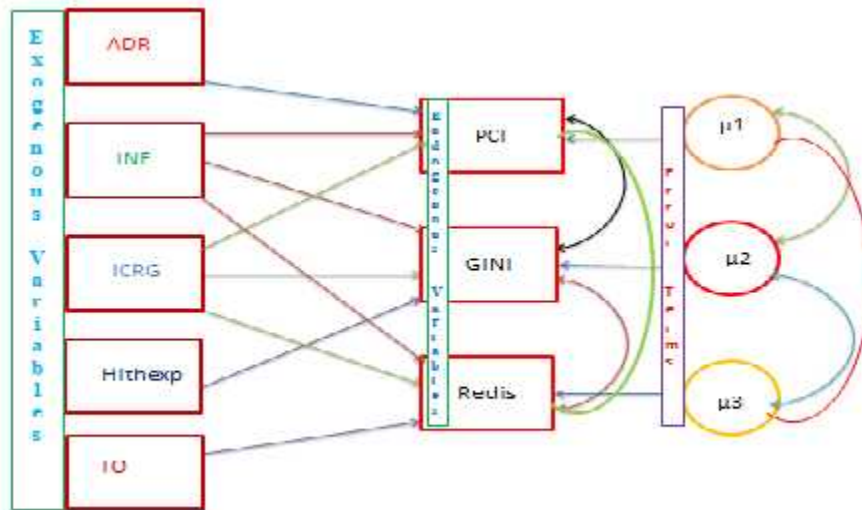
The general form of the empirical specification of the model³ used in this study can be written as

$$PCI = \alpha_0 + \alpha_1 GINI + \alpha_2 REDIS + \alpha_3 ADR + \alpha_4 INF + \alpha_5 ICRG + \mu_1 \quad 1$$

$$GINI = \beta_0 + \beta_1 PCI + \beta_2 REDIS + \beta_3 HLTHEXP + \beta_4 INF + \beta_5 ICRG + \mu_2 \quad 2$$

$$REDIS = \gamma_0 + \gamma_1 PCI + \gamma_2 GINI + \gamma_3 TO + \gamma_4 INF + \gamma_5 ICRG + \mu_3 \quad 3$$

To estimate the set of equations (1 to 3) it needs to consider the possibility of cross-equation correlation (contemporaneous correlation) which is due to inter-linkages of economic growth, inequality and redistribution. The figure below depicts the conceptual framework of the model.



²Bangladesh, India, Indonesia, Iran, South Korea, Malaysia, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Turkey

³For variables description see Appendix

In case of the contemporaneous correlation the appropriate technique for estimating the model is Seemingly Unrelated Regression (SUR). The main advantage of this technique is that the cross-equation correlation is accounted for. The SUR estimation procedure is optimal under the contemporaneous correlation assumption, so no standard error adjustment is necessary. As per Breusch-Pagan statistic given in Table.2 reveals that there is contemporaneous correlation, suggesting that SUR is an appropriate estimation technique.

Table 2: Correlation Matrix of Residuals

| | PCI | GINI | REDIS |
|--|---------|--------|--------|
| PCI | 1.0000 | | |
| GINI | 0.1929 | 1.0000 | |
| REDIS | -0.1492 | 0.2797 | 1.0000 |
| Breusch-Pagan test of independence: $\chi^2(3) = 28.916$, Pr = 0.0000 | | | |

6) INTERPRETATION OF THE RESULTS

Equation 1 indicates that Income inequality has negative effect on economic growth. The probable reason for negative relationship between the variables may be poor socio-politically stable society which experiences more violent protests, ethnic tensions, and social polarization. It exerts bad impact on the process of economic growth and hurts investment climate in the country. Secondly income inequality can retard economic growth through its impact on human capital. The imperfections of credit markets discourage people from realizing their potential fully due to the lack of financial resources. It exerts bad impact on investment particularly in human capital and knowledge building which leads to the reduction of economic growth. This result is consistent with the findings of Barro (2000); Keefer and Knack (2002); Galor and Moav (2004). Furthermore, there is bidirectional causality between income inequality and economic growth which means that on one hand, high income inequality leads to lower economic growth on the other hand high economic growth leads to lower income inequality. This may be due to the trickle down phenomenon through redistribution.

The results of the study show that redistribution exerts positive impact on economic growth. This may be due to the fact that redistribution

decreases income inequality which increases economic growth. The causality in this case is only unidirectional which runs from redistribution to economic growth but there is no causality from economic growth to redistribution.

Age dependency ratio has negative and statistically significant impact on economic growth. It is important to mention that high dependency means high proportion of population is not taking part in the economic activities and is a burden on the labor force. It hurts the process of economic growth badly. Inflation is statistically insignificant which means inflation does not have an impact on economic growth. The coefficient of governance is positive and statistically significant which means that better governance structure creates business friendly environment which helps in promoting economic growth.

Table 3: Results of Seemingly Unrelated Regression

| | PCI | GINI | REDIS |
|--------|-----------------------|-----------------------|---------------------|
| GINI | -431.54** (0.000) | | -0.141** (0.000) |
| REDIS | 1476.16** (0.000) | -1.84** (0.000) | |
| ADR | -223.715** (0.000) | | |
| INF | 1.26 (0.964) | -0.0102 (0.645) | -0.005 (0.303) |
| ICRG | 46065.58** (0.000) | 14.15** (0.000) | -2.97** (0.000) |
| PCI | | -0.00021** (0.000) | -3.77 (0.998) |
| Health | | -0.388 (0.217) | |
| To | | | 0.0068** (0.000) |
| CONS | 5830.65 (0.222) | 39.28** (0.000) | 9.45 ** (0.000) |
| R sq | 0.6679 | 0.1532 | 0.2952 |

**shows significance at 5% level of significance. In parenthesis P values are given.

In the second equation the coefficient of redistribution is negative and statistically significant which reveals that higher redistribution of income

leads to reduction in income inequality. The coefficient of inflation shows that inflation has no significant impact on income inequality. Governance plays negative role in reducing income inequality as it has positive and statistically significant coefficient which means governance is not pro equality rather better governance leads to higher income inequality and rich becomes richer while poor becomes poorer under the umbrella of good governance. Economic growth has negative sign which is statistically significant. This indicates that higher economic growth leads to lower income inequality. The coefficient of health expenditure is positive but statistically insignificant which means that the expectation of high expenditure on health leads to healthy labor and better earning capabilities is not realized. So expenditure on health fail to reduce income inequality in Asian developing countries.

In third equation the coefficient of Income inequality is negative which is statistically significant which means an increase in income inequality leads to decrease in redistribution. Furthermore, inequality and redistribution have bidirectional causality. Governance structure is a hurdle in the way of redistribution. This means better governance increases inequality by curtailing redistribution. Inflation is insignificant in redistribution process. The role of economic growth is also insignificant in redistribution of income. Trade openness plays a significant role in the redistribution of income. It may be due to the fact that trade openness creates more employment opportunities.

7) CONCLUSION

Widespread increase in income inequality has raised concerns about its potential impact on economic performance of developing economies and at the same time it urges for the need of redistribution for the attainment of welfare. The present study contributes to the existing literature by exploring the impact of income inequality, redistribution and economic growth simultaneously in selected Asian developing countries. The results of this study reveal that income inequality has negative impact on economic growth, while redistribution has positive impact on economic growth. Furthermore, there is bidirectional causality observed which runs from income inequality to economic growth and vice versa. However, there is unidirectional causality running from redistribution to economic growth. The negative impact of income inequality on economic growth brings up the need for formulating and implementing such policies which

help in reducing income inequality so that sustainable economic growth can be achieved. The positive impact of redistribution on economic growth gives signal to policy makers to take steps for redistribution of income. For this purpose structural changes should be introduced in the setup of the economy. There is a need to introduce radical changes in the taxation structure of Asian developing countries.

REFERENCES

- Aghion, P., Caroli, E., & Garcia-Penalosa, C. (1999). Inequality and economic growth: the perspective of the new growth theories. *Journal of Economic Literature*, 1615-1660.
- Alesina, A., & Perotti, R. (1994). The political economy of growth: a critical survey of the recent literature. *The World Bank Economic Review*, 8(3), 351-371.
- Alesina, A., & Rodrik, D. (1994). Distributive politics and economic growth. *Quarterly Journal of Economics*, 465-490.
- Allegrezza, S., Heinrich, G., & Jesuit, D. (2004). Poverty and income inequality in Luxembourg and the Grande Région in comparative perspective. *Socio-Economic Review*, 2(2), 263-283.
- Assa, J. (2012). Inequality and Growth Re-Examined. *Technology and Investment*, 3(1), 1-6.
- Auerbach, A. J., Hassett, K. A., & Oliner, S. D. (1993). *Reassessing the social returns to equipment investment* (No. w4405). National Bureau of Economic Research.
- Banerjee, A. V., & Duflo, E. (2003). Inequality and growth: What can the data say? *Journal of Economic Growth*, 8(3), 267-299.
- Barro, R. J. (2000). Inequality and Growth in a Panel of Countries. *Journal of Economic Growth*, 5(1), 5-32.
- Barro, R. J. (2008). *Inequality and growth revisited* (No. 11). Asian Development Bank.
- Berg, A., Ostry, J. D., & Zettelmeyer, J. (2012). What makes growth sustained? *Journal of Development Economics*, 98(2), 149-166.
- Bertola, G. (1993). Market structure and income distribution in endogenous growth models. *American Economic Review*, 83(2), 1184-99.
- Benabou, R. (1996). Equity and efficiency in human capital investment: the local connection. *The Review of Economic Studies*, 63(2), 237-264.
- Benabou, R. (2000). Unequal societies: Income distribution and the social contract. *American Economic Review*, 96-129.

- Benabou, R. (2002). Tax and Education Policy in a Heterogeneous-Agent Economy: What Levels of Redistribution Maximize Growth and Efficiency? *Econometrica*, 70(2), 481-517.
- Bleaney, M., Gemmell, N., & Kneller, R. (2001). Testing the endogenous growth model: public expenditure, taxation, and growth over the long run. *Canadian Journal of Economics/Revue canadienne d'économique*, 34(1), 36-57.
- Boadway, R., & Keen, M. (2000). Redistribution. *Handbook of income Distribution*, 1, 677-789.
- Brady, D. (2003). The politics of poverty: left political institutions, the welfare state, and poverty. *Social Forces*, 82(2), 557-588.
- Castello, A., & Domenech, R. (2001). Human capital inequality and economic growth: some new evidence. *The economic journal*, 112(478), C187-C200
- Castelló-Climent, A. (2010). Inequality and growth in advanced economies: an empirical investigation. *The Journal of Economic Inequality*, 8(3), 293-321.
- Castells Quintana, D., & Royuela Mora, V. (2014). Tracking positive and negative effects of inequality on long-run growth. *IREA-Working Papers, 2014, IR14/001*
- Cheema, A. R., & Sial, M. H. (2012). Poverty, Income Inequality, and Growth in Pakistan: A Pooled Regression Analysis. *The Lahore Journal of Economics*, 17(2), 137.
- Chotikapanich, D., Griffiths, W. E., Prasada Rao, D. S., & Karunaratne, W. (2014). *Income distributions, inequality, and poverty in Asia, 1992-2010* (No. 468). ADBI Working Paper Series.
- Chung, H., & Thewissen, S. (2011). Falling back on old habits? A comparison of the social and unemployment crisis reactive policy strategies in Germany, the UK and Sweden. *Social Policy & Administration*, 45(4), 354-370.
- Clarke, J. (1992). More Evidence on Income Distribution and Growth. Country Economic Department, *The World Bank, WPS 1064*.
- Deininger, K., and L. Squire. 1998. New ways of looking at old issues: inequality and growth. *Journal of Development Economics*, Vol. 57, 259-287.
- Easterly, W. (2007). Inequality does cause underdevelopment: Insights from a new instrument. *Journal of Development Economics*, 84(2), 755-776.
- Forbes, K. J. (2000). A Reassessment of the Relationship between Inequality and Growth. *American economic review*, 869-887.

- Gakuru, R., & Mathenge, N. (2012). Poverty, Growth, and Income Distribution in Kenya. A SAM Perspective AGRODEP Working Paper June 2012, 0001.
- Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *The Review of Economic Studies*, 60(1), 35-52.
- Galor, O., & Moav, O. (2004). From physical to human capital accumulation: Inequality and the process of development. *The Review of Economic Studies*, 71(4), 1001-1026.
- Group, W.B., *World Development Indicators 2015*. 2015: World Bank Publications.
- Gruen, C., & Klasen, S. (2008). Growth, inequality, and welfare: comparisons across space and time. *Oxford Economic Papers*, 60(2), 212-236.
- Goudswaard, K., & Caminada, K. (2010). The redistributive effect of public and private social programmes: A cross-country empirical analysis. *International Social Security Review*, 63(1), 1-19.
- Gyimah-Brempong, K. (2002). Corruption, economic growth, and income inequality in Africa. *Economics of Governance*, 3(3), 183-209.
- Immervoll, H., & Richardson, L. (2011). Redistribution policy and inequality reduction in OECD countries: What has changed in two decades?
- Kaldor, N. (1957). A model of economic growth. *The Economic Journal*, 591-624.
- Keefer, P., & Knack, S. (2002). Polarization, politics and property rights: Links between inequality and growth. *Public Choice*, 111(1-2), 127-154.
- Kenworthy, L. (2003). Do affluent countries face an incomes-jobs trade-off? *Comparative Political Studies*, 36(10), 1180-1209.
- Kuznets, S. (1955). Economic growth and income inequality. *The American Economic Review*, 1-28.
- Lindert, P. H. (2004). *Growing public: Volume 1, the story: Social spending and economic growth since the eighteenth century* (Vol. 1). Cambridge University Press.
- Mahy, B., Rycx, F., & Volral, M. (2011). Does wage dispersion make all firms productive? *Scottish journal of political economy*, 58(4), 455-489.
- Meltzer, A.H., and S.F. Richard. 1983. Tests of a rational theory of the size of government. *Public Choice* 41(3): 403-18.
- Milanovic, B. (2000). The median-voter hypothesis, income inequality, and income redistribution: an empirical test with the required data. *European Journal of Political Economy*, 16(3), 367-410.

- Oechslin, M., Halter, D., & Zweimüller, J. (2010). Inequality and Growth: The Neglected Time Dimension.
- Okun, A. M. (1975). *Equality and efficiency, the big tradeoff*. Brookings Institution Press.
- Pagano, P. 2004. An empirical investigation of the relationship between inequality and growth. *Bancad'Italia, Temi di discussione del Servizio Studi*. No. 536.
- Persson, T., & Tabellini, G. (1991). *Is inequality harmful for growth? Theory and evidence* (No. w3599). National Bureau of Economic Research.
- Persson, T., & Tabellini, G. (1996). Federal fiscal constitutions: risk sharing and redistribution. *Journal of Political Economy*, 979-1009.
- Perotti, R. (1996). Growth, income distribution, and democracy: what the data say. *Journal of Economic Growth*, 1(2), 149-187.
- Perotti, R. (1992). Income distribution, politics, and growth. *The American Economic Review*, 311-316.
- Perotti, R. (1993). Political equilibrium, income distribution, and growth. *The Review of Economic Studies*, 60(4), 755-776.
- Persson, T., & Tabellini, G. (1994). Does centralization increase the size of government? *European Economic Review*, 38(3), 765-773.
- Pierson, C., & Castles, F. G. (Eds.). (2006). *The welfare state reader*. Polity.
- Pontusson, J. (2005). *Inequality and prosperity: Social Europe vs. liberal America*. Cornell University Press.
- Rawls, J. (1971). *A Theory of Justice*. Cambridge, Mass.: Harvard University.
- Rehman, H. U., Khan, S., & Ahmed, I. (2008). Income Distribution, Growth and Financial Development. *Pakistan Economic and Social Review*, 46(1), 1-16.
- Romer, C. D., & Romer, D. H. (2010). The macroeconomic effects of tax changes: estimates based on a new measure of fiscal shocks, *American Economic Review* 100 (June 2010): 763-801.
- Rooth, D. O., & Stenberg, A. (2012). The Shape of the Income Distribution and Economic Growth—Evidence from Swedish Labor Market Regions. *Scottish Journal of Political Economy*, 59(2), 196-223.
- Sapir, A. (2006). Globalization and the reform of European social models. *JCMS: Journal of Common Market Studies*, 44(2), 369-390.
- Solt, Frederick. (2009). Standardizing the World Income Inequality Database. *Social Science Quarterly* 90(2), 231-242. SWIID Version 5, December 2014
- The Quality of Government Dataset, version 2014. University of Gothenburg.

Appendix

Income inequality (Gini)

Income inequality is presented by Gini coefficient which ranges from 0 to 1 and a value closer to zero means income is equally distributed while, on the other hand, a value closer to 1 means income is highly unequally distributed.

Redistribution (Redis)

Redistribution is measured by the difference between the gross Gini coefficient and net Gini coefficient, *i.e.* income inequality before taxes and transfers (market inequality or gross inequality) and after taxes and transfers (net inequality).

Economic growth (Pci)

Real per capita income has been used as proxy for economic growth.

Governance (Icrg)

The study uses composite index ranging from 0 to 100, which consists of economic, political and financial risk level. A value closer to zero indicates high level of risk and value closer to 100 means very low risk.

Age dependency ratio (Adr)

Age dependency ratio has been taken as a percentage of working age population *i.e.* the ratio of dependents people that are younger than 15 or older than 64 years to working age population which is between 15-64 years.

Inflation (Inf)

Inflation has been measured by GDP deflator.

Health Expenditures (Hlthexp)

Health expenditures has been used as a percentage of GDP

Trade openness (TO)

Trade openness is trade volume as a percentage GDP, *i.e.*

$$\left(\frac{\text{Exports} + \text{Imports}}{\text{GDP}} \right)$$

