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Economic Development Amidst Income Inequalities and Tax Structure: A Case Study of Pakistan (1976-2011)

Hadia Jabeen[1] Sami Ullah[1*] Izhar ul Hassan[2]
1.Department of Economics, University of Peshawar, Pakistan
2.Department of Economics, Qurtaba University Peshawar, Pakistan

Abstract
Foremost objective of every state is to ensure equal distribution of incomes and justice among the general public. As of a macroeconomic point of view, if the governments want to attain this objective, tax is one of the most significant tools of fiscal policy. This research explores the relationship among growth, inequality and economic development in the perspective of Pakistan. Time series macro data were used and the impact of taxes on income distribution has been investigated for the period 1976-2011 by employing Auto Regressive Distributed Lag (ARDL) econometrics techniques. The index of Gini coefficient was used as an instrument for calculating the income inequality. There are numbers of factors which are responsible for uneven allocation of income in a country, although investment, progressive taxation and growth expenditure on community services play an important function in reducing inequality. This research shows that the share of high income class in GDP is greater as compared to the share of poor class in total manufacture. we may note that this has been as the corporate income raise in developing countries like Pakistan which lead increase in saving and positive impact on the total investment as a outcome its major share goes into the pocket of elite class, so its work in differing direction it lift up income inequality instead of decreasing inequality. The rate at which the income of corporate (elite class) increase is very high than the rate of increase in wages. The results of the estimated model show that there is a long-term equilibrium relationship between independent and dependent variables. The results of the long-term equilibrium relationship show that the coefficient of direct taxes is significant and positive. The outcome also point out a positive correlation between per capita GDP and income inequality
Keywords: Income, Tax, Wage, Inequality, Gini coefficient, GDP

1. Introduction

Economic development is considered to be an influential power for reduction of poverty. Persistent economic growth boosts the income and employment which in return, will decrease poverty. Likewise, increase in efficiency and growth is the outcome of better earns. It also decreases the poverty. However, the allocation of income changes with growth in economy and primary income inequalities via reduction in poverty determines the rate of economic growth. The inequalities are interdependent. Many developing countries subject to rising income inequalities attained high growth rates in different times but however poverty did not lessened considerably in these periods. Since 1970, most of East Asian and South economies developed at advanced per capita rates along with increase in income inequality over the time, particularly, a less than partial of normal growth was observed in the Latin American countries growth rates compared to that of East Asia and South Asian extraordinary income inequality. The motivating growth is not sufficient to reduce poverty; they need balance efforts to reduce income inequalities at a certain rate of growth to minimize differences in income level. Economic development considerably depends on tax revenue collection, as it has been rightfully said that, 'what the government gives, it must first take away' (Chaudhry & Munir, 2010). There are also some limitations of taxation but these considerably exceed the amounts that can be raised by resorting to the printing of new currency notes, internal borrowing, external borrowing, levies and taxation. In all these revenue making sources taxation, however, is thought to be the most efficient source of revenues for the government. Pakistan grimly lacks in a well efficient tax culture. It comes as an alien perception. Development is actually meant a transformation. It is a permanent and dynamic procedure that shifts economies from worst phase to improved phase of development. It is a practice of social and economic change inside countries. The idea of development is necessary to hold in your arms the main social and economic objectives and principles that society strives for. The reason of development is to reduce inequality, poverty, unemployment and accomplish sound economic growth. Most important objectives of development are to reduce poverty, income inequality and to offer fundamental desires (Round & Whaley, 2002).

However, the poor may not essentially obtain a few of the reimbursement from growth and this is particularly true in countries with elevated levels of inequality. Furthermore, the growth does not make certain contact to education ,wellbeing, and a better standard of livelihood or a clean irrigate supply intended for those living in a few, typically remote regions. Assistance can add to 6poverty reduction by marking the poorest areas and development in the social zone. In calculation, security net ought to be offered to defend the most exposed from outsides hock. "A valuable anti-poverty aid strategy is probable to all together operate each of these three approaches: through targeting, support growth and protection nets", these three approaches in rotate raise growth.

On the other side, the Australian aid is paying attention to attain the subsequent four objectives for reducing poverty: (i) civilizing social indicator, (ii) prediction for sustainable economic growth, (iii) increase authority structure and (iv) strengthen the peace procedure in Bougainville. These objectives are directly proceeding on the Medium Term Development plan (1997-2002), a main concern of the Papua New Guinea Government's. The main concerns are primary and basic education; promotion of income-earning opportunity for local entrepreneurs; law and order; transportation infrastructure protection; primary health care mainly in 6rural areas and the diplomatic declaration of the Bougainville disaster (AusAID, 2001). Latest explanation which works on the question 6why inequality is shocking for growth consists of the intention that inequality can direct to variance political instability and social tensions which reduce growth by put off, increasing the rate of doing business, reducing the protection of assets rights and overseas household speculation. Additionally, poverty reduction may not unavoidably be reduced during economic growth, if growth goes along with by adverse effect on income inequality. Consequently, it is significant that a policy to reduce poverty must contain strategy which support in restructuring income. Particularly, the possible magnitude of growth to inequality and poverty reduction, administration must be dynamic in the procedure of redistribution. To reduce income inequality, redistribution Policies are supportive. Fiscal the poor support capital concentrated production whereby the decision elite have yielded the leading incentive through economic growth, poverty and Income inequality and directly and not directly have an effect on each one (Haroon Jamal, 2006).

There are two mode associations with one another. All of these relations can be investigated independently, but habitually one influences other reason circuitous effects. Such as inequality in income influences growth which in turns has consequences for poverty through an indirect influence on poverty. Small variations in the sharing mechanism of income can significantly affect poverty. An uncomplicated arithmetic instance can help envision this. Nationalized income accruing to the twenty percent poorest of Pakistan population grows from 7 to 7.25 percent. A variation in income spread of one percent would barely affect the Gini Co-efficient, but this would imply 4 percent surge in the total income for poor. A slight rearrangement in allocation would have same effect on poverty as replication the yearly growth of national income from 4 % to 8 %. An additional reason of income inequalities is the progressivity of the tax structure. A progressive taxis one which grows with the growth in income. In progressive tax set-up, the resultant impact of a highest tax rate will normally be direct on the level of inequality within a society; the variation in it whether upward or downward will confirm that income doesn't change to changes in tax structure. The difference among the Gini index for an income distribution preceding taxation and the Gini index following taxation is an indication of the special possessions of such taxation (Haroon Jamal, 2006).

Pakistan's economic performance since1947 has stayed unpredictable, across the region and area, and even its formation has rapidly changed above the period of time. Ever since 1971, the economy of Pakistan constantly has faced deficit budget (East and West both budgets). When expenditure revenue gap increases, inflation rate has gone up higher, the development rate has falter, poverty level raises and most prominently, the economy has experienced a deficit which has frequently lead to in an adverse balance of payment situation. For almost 25 years, in Pakistani tax structure and tax efficiency play central position. Though, during this era with all efforts the contribution of tax to GDP ratio stays stable. During this phase of time, Pakistan has a sound political era which has strong force on the economy of Pakistan. Especially in 1980s, the government of Pakistan has received enormous assistance due to this Pakistan has faced serious situation during the war period in Afghanistan in opposition to USSR. Pakistan government efforts for tax are harmfully affected during this period. This is a martial rule and government evades any new taxation. The era of 1990s, due to depression in the economy and IMF conditionality's complete extreme increases in income tax and sales tax since of WTO command a radical reduction in custom duties, and, the tax to GDP ratio stay behind stable. On the other hand, during this period force is made on the tax system to add to tax revenue through better competence. So, in 1990s, the fiscal dilemma formerly again becomes sensitive, with the budget deficit variable approximately 6 % of GDP. As predictable, this is attended by poor economic act, distinguish by a reduce speed of growth as evaluated to a normal annual rate of 6 % in the 1980s as to a standard of 4 % in 1990's. Inflation also increases double level as compare to average 12 % yearly. In Pakistan the contribution of tax to GDP currently steady and the tax and GDP ratio at this instant under 10%.In recent times, the government is paying concentration on macroeconomic stabilization program which is hold up by IMF. It is one of the main reasons of declining in tax-to-GDP ratio. Foremost stress has been originated upon fiscal sustainability and budget short fall cutback in order to consist of the rate of inflation. Though the drop in the tax-to-GDP ratio, thus affect the inducement towards the growth of the economy, need sharp cutbacks in society spending, mostly on development. Drop in tax to GDP ratio may have several causes. One is the falling acceleration of economic growth, especially of imports and large scale productive sectors that are the primary source of tax revenues in the economy. The reason for fall in normal tax to GDP ratio is the incidental and insignificant tax-to-GDP ratio. The next one of the analysis is that there is a general drop in the payment trend of taxes and a general rise corruption. It is maintained that the incidence of taxes has well declined. Finally, the process of trade liberalization in the decade of the 90's is associated to

revenue sufferers consequential from the current tax modification in the country, which has complicated major decline in legal rates of import tariffs (Chaudhry 2010).

One of the most shocking factors is regressive tax system which is the cause of increased income and wealth inequalities in Pakistan. Statistics expose that the rich class pay minimum direct tax on their wealth, while taxes on the poor increase by almost 35% during the last 10 years. The federal government policies have also been intended to provide advantage to the rich, keeping the poor at a disadvantage. What is even more alarming is the heating up rent and rave of the poor against the rich. One of the views is that if the government does not take serious action against the increasing disparity between the rich and poor classes, it will lead to a civil war. Moreover, the government policies also need to be revised to link the gap that is between the rich and poor class of Pakistan. The current study has a lot of pragmatic and hypothetical literature on its back.

2. Objectives of the study

i. To evaluate critically the existing tax structure in Pakistan.
ii. To find out the relationship (Trend Analysis) between tax and income inequalities of Pakistan during 1976-2011.
iii. To examine the income inequalities impact on the development of Pakistan during 1976-2011.

3. Literature review

Kakwani (2004) describes interrelationship between economic poverty, growth and inequality. In the course of the idea of pro-poor growth, the study has tried to find, how much the poor get benefit from economic growth. The author has introduced an index of pro-poor, known as Poverty Equivalent Growth Rate (PEGR) which makes explanation of both the benefits of growth and scale of growth which is received by the poor class. If we want to reduce poverty, we should maximize the PEGR than the growth rate only.

Hiranya and Abdullah (2004) in their study; Trade Liberalization, Inequality and Growth in Bangladesh, originate some indications of trade liberalization effects growth in Bangladesh. They also found that income distributions are nominally affecting investment or growth. Poor quality data on income-inequality is used in study.

Panizza (2002) shows that up to twenty years inequality has a negative impact on growth. Through OLS, he investigates the Gini to have a blow of -.39% per year, more than ten years in contrast to 0% to -2.4% in this study. He finds no significant cause over twenty years even as a significant negative impact of 1.3% to 4.7%. Using set effects, Panizza finds the Gini to have an effect among% and -.78% per year. This transforms to a positive effect (collection in degree from .51% to .61%) over twenty years. The change of the symbol on the Gini coefficient pragmatic by Panizza using permanent effects among ten and twenty years period also happen in study. Panizza also presents proof of a quartic occupation, connecting inequality to growth, and his quadratic affiliation also points out that the Gini Co-efficient has a negative effect on growth for any standards, close to the represented in his data.

Duflo & Beenerji (2003) in a study discovered no affiliation linking growth and inequality. But, the sample is divided into rich and poor countries. A positive correlation is created in the sample of rich countries and a negative association in the sample of poor countries. This decision is fairly motivating as it recommends that the rich countries the pro uneven argument strength be more appropriate, while on the other hand the pro identical argument would be reasonable for poor countries.

Joumard et al. (2012) concluded that transfer-systems and tax play main role in decreasing on the whole income inequality. Cash transfers, such as unemployment pensions and child benefits explanation for taxes one quarter and three quarters of the general redistributive impact, and. on the other hand, there are great difference crossways the OECD progressivity of taxes , composition and cash transfers.

Chawla & Wannel (2003) have explained that in United States, high-income earning families pay extra regular taxes on their permanent assets, most of the real estate taxes depends on the larger allocate of the revenue of the low income families. In the United Kingdom, for example, the Council Tax amounts to over 2% for those in the top decile and 6% of bottom decile income for non-retired families.

Koske et al. (2012) explained that labour income inequality reduces due to raises in GDP per capita. Though, the new researches , counting new OECD investigation, recommend that a reduce in the lowest wage risks widening the distribution of wages at the basis of the circulation along with those who are previously working, so that the working age residents impact on labour income inequality is vague. When the initial level of least labour costs is previously low32the employment effect of a lower minimum wage is likely to be smaller, which increases the probability that labour income inequality will increase.

Teera (2002) has investigated the factors which affect the tax system of Uganda and tax structure in the country. He has estimated a model using the time series data of the period 1970 to 2000 and his consequences show that all types of taxes like population density and agriculture ratio etc. are affected from tax evasion. GDP per capita showed the shocking negative indication. Aid variable showed positive sign while aid in Uganda for

all times supported imports particularly raw material so not amazingly. Openness (as exact by import ratio) and tax evasion indicate the significant negative impact.

Bahl (2003) examined the determinants of tax revenue, using data of OECD and under-developed economies he concentrates on the rate of residents' growth and non-agricultural contribution of GDP. All of these show the statistically significant and positive consequence. Simple relationship among the size of shadow economy and tax effort show the statistically significant but negative outcome.

Alm et al. (2004) has taken the facts of developed and developing countries. The determinants of total tax to GDP ratio are mining/GNP, agricultural/GNP, shadow economy/GNP and GNP per capita, taxes on international trade/GNP. His domino effect indicates the statistically significant and positive relation with mining/GNP and negative but statistically significant relation with shadow economy /GDP.

Ahsan & Wu (2005) studied that the period of 1979-2002 and compare the developed and developing countries for tax contribution in GDP. They have examined a significant and negative connection of GDP per capita, agriculture share, and population growth to the tax share as trade contribution in GDP. It has significant and positive relationship but corruption has insignificant and negative correlation.

Barro, R. J. (2000) studied empirically the income inequality and economic growth of certain poor countries and confirms that the more is inequality the slow will be the pace of economic growth in poor countries while it in case of rich countries the relationship between the two is positive. Roberto Perotti further finds the relationship that exists in income distribution, democratic institutions, and economic growth. Perotti concludes that political instability as well as the education/fertility rates describes the negative association between income distribution and economic growth.

Bird (2005) reveals that a tax structure cannot be used to get better income distribution, as in developing countries, income tax is imperfect and unprogressive and that decision-making and political expenses of the enforcement of a progressive tax structure are very far above the ground. Therefore, he suggests cost strategy and expenditure taxes in good turn of the poor as the substitute technique for declining inequality and poverty.
Mahmood Moazzam (2001) concluded in his study that the income inequality in 1996-97 had been close to the ground, the inequalities have been the utmost in the 1990s match up to any time era in the past of Pakistan in 1987-88 and 2001-02. The richest 20% increase while the poorest 20% misplaced share in both the urban and rural areas. While in substantial gain of the richest 20% representative wearing away of the middle class and decline in income share of the poorest 20% was subsidiary since it was already not enough, the attrition of income share of middle 60% was extensive consequential. In urban than in rural areas the erosion of income share of middle 60% was extra well-defined. We may make a note of that this has been the phase when Pakistan go after Structural modification and Stabilization Programs. All in excess of the human race such programs have led to augment in the income inequality.

4. Research methodology

Two research objectives related models are explained in detail in this chapter. Model-I describes taxes (ratio of direct and indirect taxes) relationship with income inequality. Model-II describes economic growth and income inequality relationship. Whereas, describing the impact of taxes on income inequality and income inequality on economic growth, complete description of dependent and independent variables such as ratio of direct to indirect taxes and Gini in model 1st, Gini, investment, consumption and gross domestic product in model 02 have also been given. Data and data sources has also described in detail in this chapter. The data used is pure time series data (1976-2011). Different time series econometrics techniques have been used to accomplish the main research objectives.

4.1 Data, data source and variables

Purely time series data is used in research Problem because of unavailability of quarterly or monthly data we use annually data from period 1976 to 2011. The Gini- coefficient, data has obtained from Pakistan Poverty Alleviation Fund (PPAF), and Social Policy and Development Center (SPDC) the independent variables, direct taxes, indirect taxes and total taxes data has obtained from Federal Board of Revenue (FBR), Gross Domestic Products (GDP) data has obtained from economic survey of Pakistan.

4.2 Methodology

It is important to check the stationary of the variables first, because if the variables are non-stationary then it produces spurious or none sense regressions. Therefore, test of stationary is conducted. Various tests are used in order to check the stationary of the variables. The present study use Augmented Dickey Fuller (1979-1981) and Phillip- Peron unit root test (1988), in the absence of structural break because these are considered low power test in presence of structural break. As it is clear from the literature that for the existence of long run relation among the variables different tests have been utilized like Johansen (1991), Johansen-Juselius (1990) , Engle and Granger (1987) framework required that the underlying time series should be integrated of order one, that is I(1)

where as Johanson-Juilins (1991) technique is employed to the time series that is integrated with same order. These two models ARDL besides is frequently used in current practice because its overcome some of the difficulties associated with Johanson-Juilins (1991) and Engle- Granger co integration techniques. ARDL can be employed to the time series integrated of order zero and one that is I(0) and I(1).ARDL models has the advantage that it takes a sufficient number of lags to seize the data generating process. In this respects ARDL allows flexibility to the structure of lags of the independent variables in contest to vector autoregressive (VAR) models, where different lags for different variables are not allowed. Further advantage of ARDL is that its long-run coefficients are asymptotically normal, whether the independent variables are I(0), I(1) or a combination of I(0) and (1). For the reasons and advantage of mentioned above of ARDL over the other available models, we make use of ARDL in our present study. It is also used if the variables are of mix order of integration. These techniques give accurate and authentic results in instance of small sample and endogeneity problem. Haug (2002) investigated that ARDL techniques provide good results in case of small sample data as compare to other co integration techniques. ARDL approach is more advanced and recently used frequently in social sciences.

Model-I Specification

To ascertain relationship among income inequality, direct taxes and indirect taxes, we estimated the following model.

L Gini = $f\left(LDTGDP, LDTIT, \right)$ ……..Eq (1-M1)

L Gini$_t$ = $\beta_1 + \beta_2\, LDTGDP_t + \beta_3 LDTIT_{\ t} + ei$ …….Eq (2-M1)

Where in the above model

Gini stands for Gini coefficient as measured of income inequality.

DTGDP stands for ratio of direct taxes to gross domestic product.

DTIT indicate ratio of direct taxes to indirect taxes.

This study uses ARDL econometrics techniques the Error Correction Version of ARDL is given as:

$$\triangle \text{LGini} = \alpha_0 + \sum_{i=1}^{q_1} \alpha_1 \Delta\, LGini_{t-i} + \sum_{i=1}^{q_2} \alpha_2 \Delta\, LDTGDP_{t-i} + \sum_{i=1}^{q_3} \alpha_3 \Delta\, LDTIT_{t-i} +$$

$$+ \beta_1\, LGini_{\ t-1} + \beta_2\, LDTGDP_{\ t-1} + \beta_3\, LDTIT_{t-1} + \varepsilon_i$$ ……Eq (3-M1)

Where, Δ is the difference, $\alpha 1$, $\alpha 2$, and $\alpha 3$are the short run coefficients, while β_1, β_2, β_3 are the coefficient of long run. q1, q2 and q3 are the number of lags for variables like Gini, DT, and IT respectively. So in the above model-I the null hypothesis is that there is no long run relationship among the variables and is based on F-statistic (value). If F calculated value is greater than the critical value (tabulated value), then the hypothesis of no co integration (null hypothesis) is rejected, but in case of higher critical value that the F- calculated value hypothesis of no co-integration (null hypothesis) is not rejected.

H0: $\alpha 1 = \alpha 2 = \alpha 3 = 0$

Alternatively, long run relationship exists among the variables,

H1: $\alpha 1 = \alpha 2 = \alpha 3 \neq 0$

In order to select the optimum lag of the model, this study use Akaike information criteria.

Model-2 Specification

The second model associated with the given study is that the Gross Domestic Products (GDP) is a function of (GINI) coefficient, consumption(C) and investment (I) and the hypothesis which we investigate is that income inequality has negative impact on gross domestic products. Therefore, the following relationship will be analyzed.

LGDP = (LGini, LC, LI) …… Eq(1-M2)

LGDP$_t$ = $\beta_1 + \beta_2\, LGINI + \beta_3 LC_t + \beta_4 LI + ei$ ……Eq(2-M2)

Where, the Gross Domestic Products (GDP) is the regressed in model (2), and the included repressors are (Gini) coefficient, consumption (C) and investment (I), B2, B3 and B4 are their respective coefficients. Similarly, for the second model the study use ARDL approach the error correction version to ascertain the long and short run impact of the variables in case of mix order of integration.

$$\triangle \text{LGDP} = \alpha_0 + \sum_{i=1}^{q_1} \alpha_1 \Delta\, LGDP_{t-i} + \sum_{i=1}^{q_2} \alpha_2 \Delta L\, Gini_{t-i} + \sum_{i=1}^{q_3} \alpha_3 \Delta L\, C_{t-i} + + \sum_{i=1}^{q_3} \alpha_3 \Delta\, LI_{t-i} +$$

$$+ \beta_1\, LGini_{\ t-1} + \beta_2\, LC_{t-1} + \beta_3\, LI_{t-1} + \varepsilon_i$$ ……Eq (3-M2)

Model 2 is used to investigate the impact of Gini coefficient, consumption and investment on Gross domestic product and for this purpose Autoregressive Distributed Lag Model (ARDL) is worked out and is specified in the above equation. The reason and advantage for using ARDL are the same as discussed in the section of model-1.

5. Results

Empirical Results of Model-1

Empirical Results of Model-1 the study has utilized Augmented Dickey-Fuller (1979) and Phíllips-Perron (1988) unit root test initially in order to ascertain the order of integration. These tests of stationarity are used to avoid the problem of none sense or spurious results. Although for using ARDL approach it's not pre-requisite to check whether the variable is integrated of I(1) or I(0). Because normally most of the economic variables are of 1(1) or I(0), and the other main objective of checking stationarity of the variable is that the dependent variable of using this approach must be of 1(1). If any variable found 1(2) or dependent variable is not integrated of order one, then ARDL approach is not applicable, and then the other cointegration techniques may suit to apply and find out the relationship among the variables. So far that the proposed ADF and Phillips-Perron both tests have been utilized on each variable to determine the order of integration of each variable. The estimated unit root test by using ADF and Phillips-Perron test has explained separately in few tables for both the models. The ARDL approach has divided into two steps. Step first represents the existence of long run relationship among the variables. In the case of co-integration test where decision of accepting and rejecting depends upon the F-statistic. If F-computed value found greater than the upper critical bound value (Pesaran et al. (2001)), then the hypothesis of no co-integration has rejected, and if the F- computed value is lesser than the lower critical value, it is clear indication of non-rejection of the hypothesis of no cointegration. And the F-test gives inconclusive results when the computed values lie between the lower and upper bound critical value. The second step of this approach is to find out short relationship by utilizing Error Correction Model and lag selection criteria which based on AIC and SC. Below table 1 and table2 explained Augmented Dickey-Fuller test at level and at first difference, while Table (3, 4) has explained unit root by Phillips-Perron test respectively

Table 1. Unit Root Estimation by Augmented-Dicky Fuller Test at level

Variables	Calculated values at level	Null Hypothesis	Probability values	Remarks
LGINI	-2.652630	H0:Unit root	0.1002	Non-stationary I(0)
LDTGDP	-1.64123	H0:Unit root	0.4523	Non-stationary I(0)
LDTIT	0.00355	H0:Unit root	0.9497	Non-stationary I(0)

Source: Researcher computation

Note: I (0) Indicates non-stationarity at level.

Table 2. Unit Root Estimation by Augmented-Dicky Fuller Test at 1st difference

Variables	Calculated values at First difference	Null Hypothesis	Probability values	Remarks
LGINI	-4.912243	H0:Unit root	0.0003**	Stationary I(1)
LDTGDP	-4.6438	H0:Unit root	0.0028**	Stationary I(1)
LDTIT	-5.824048	H0:Unit root	0.0000**	Stationary I(1)

Source: Researcher computation

Note: I(1) denotes stationary at first difference,
**indicate significance at 5%.

Results of ADF test has been reported in two Tables. The estimated values in table (1) reveal that all the variables have a unit root. Our null hypothesis is that the entire variables have a unit root and on the basis of P-values we concluded that the entire variable has unit root. Comparing calculated values of Gini, DTGDP.DTIT, (-2.9458, - 1.64, 0.003) and calculated values that also gives us same conclusion. In table (2), the problem of unit root or non-stationarity has been removed after taking its first difference. This conclusion of stationary has also been taken on the basis of both P-values of the variables and also on the comparison the tabulated and critical values of each and every variable. The null hypothesis of unit root has been strictly rejected after taking its first difference.

Table 3. Unit Root Estimation by Phillips-Perron Test at level

Variables	Calculated values at level	Null Hypothesis	Probability values	Remarks
LGINI	-2.6012	H0:Unit root	0.1002	Non-stationary I(0)
LDTGDP	-1.2915	H0:Unit root	0.6229	Non-stationary I(0)
LDTIT	0.23369	H0:Unit root	0.97	Non-stationary I(0)

Researcher computation

Note: I (0) Indicates non-stationarity at level

Table 4. Unit Root Estimation by Phillips-Perron Test at 1st difference

Variables	Calculated values at First difference	Null Hypothesis	Probability values	Remarks
LGINI	-5.533866	H0:Unit root	0.0001**	Stationary I(1)
LDTGDP	-7.4774	H0:Unit root	0.0000**	Stationary I(1)
LDTIT	-5.901597	H0:Unit root	0.0000**	Stationary I(1)

Source: Researcher computation
Note: I(1) denotes stationary at first difference,
**Indicate significance at 5%.

Similarly, Phillips-Perron unit root test estimated results has been shown in two tables. Table (3) reported the stationarity of the Gini Coefficient at level, and rejected the null hypothesis of non-stationarity on the basis of probability value which is 0.05. The other two variables values DTIT and DTGDP in table (3) concluded that the null hypothesis of unit root has not been rejected. This conclusion has been taken on the basis of P- values, tabulated and critical values in above table (3). In tables (4), after taking the first difference, both of the variables DTIT and DTGDP became stationary because the critical value of the variables is less than the calculated values and the alternative hypothesis of stationarity has not been rejected. P values which are 0.000 for both the variables also suggest that the variables are stationary. So, therefore, the above results indicate that all the variables are of mix order, which support the implementation of ARDL approach.

Table 5. ARDL Long Run Relationships

Dependent Variable: D(LGINI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-0.026960	0.018601	-1.44930	0.1576
$LGINI)_{t-1}$	-0.142221	0.006088	-2.481124	0.0187
$LDTIT)_{t-1}$	-0.001572	0.000336	-2.605840	0.0140
$LDTGDP_{t-1}$	0.064871	0.022783	2.847287	0.0078

R-squared	0.489873	F-statistic	5.953833(0.000571)
Adjusted R-squared	0.407594		
Durbin-Watson stat	2.321975		

From the above results the negative relationship between ratio of direct to indirect taxes and positive relationship between direct taxes to Gross Domestic products has been confirmed. Direct to indirect taxes has negative but highly statistically significant impact on Gini coefficient having t-estimated absolute value 2.48 greater than critical value at 5 percent level. Ratio of direct to gross domestic products exhibited positive and significant effect on Gini coefficient with t-value 2.84 and having probability 0.0078 in Pakistan. It reveals that the negative sign of the ratio of direct taxes to indirect taxes tends to reduce income inequality. The magnitude suggests one percent increase in DTIT would reduce Gini by 0.006 percent in long run. Similarly DTGDP suggests that 100 percent increase would bring 6.487 percent increase in Gini keeping other thing remaining the same. R-square is 0.49 which is low but desirable, meant that dependent variable explained by independent variables is abbot 49 percent while the remaining is by other absorbed non-explanatory variables. For the joint effect of the explanatory variables normally check the F-statistics value which is 5.59 greater than critical value with probability value 0.0006, show that the overall model is highly statistically significant. The Durban Watson value (2.32) suggests no autocorrelation in the given model. The long run relationship has been analyzed by employing Wald test; the null hypothesis is that there is no long relationship among the variables has strongly been rejected against its alternative hypothesis at 5% significance level. Because the F- computed values is 5.27(0.004) higher than the upper critical bound value 5.02.

Table 6. ARDL Error Correction Model
Dependent Variable: D(GINI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.011070	0.002095	5.283282	0.0000
$D(lGINI)_{t-1}$	-0.017443	0.006201	-2.812988	0.0090
$D(DTIT)_{t-1}$	-0.006103	0.002959	-2.062576	0.0489
$D(DTGDP)_{t-1}$	0.072974	0.031050	2.350227	0.0263
ECM_{t-1}	-0.440650	0.238684	-1.846167	0.0759

R-squared	0.594182
Adjusted R-squared	0.473940
F-statistic	4.941546(0.000772)
Durbin-Watson stat	2.008191

To find our short run response between GINI coefficient and it explanatory variable, ratio or direct to indirect taxes, the ECM Model has utilized. The result shows that R- Square value is 0.59, means 59 percent of variation in explained variable i-e GINI coefficient caused by the explanatory variables. F-statistics value is 4.94 and its corresponding probability value is 0.00072, which is higher than the critical value and show the overall impact of the repressors on the GINI coefficient in Pakistan. As we observed from the above table results that, in short run DTGDP (Direct taxes to Gross Domestic Products ration) has highly positive significant impact on GINI coefficient, having t-statistic value 2.35 at 5 percent. The value DTIT (Direct taxes to indirect taxes ration) exhibited negative having t-value 2.6025 and significant at 5 percent. The ECM coefficient have a little bit high magnitude and significant at 7 percent. ECM value -0.44 which means the speed of adjustment from disequilibrium to equilibrium is about 44 percent and it also give validity of long run relationship between regressed and regressor.

Empirical Results of Model-2

TABLE 7. Unit Root Estimation by Augmented-Dicky Fuller Test at level

Variables	Calculated values at level	Null Hypothesis	Probability values	Remarks
LGDP	-0.357353	H0:Unit root	0.9060	Non-stationary I(0)
LPI	1.054360	H0:Unit root	0.9963	Non-stationary I(0)
LPC	-2.776917	H0:Unit root	0.0719	Non-stationary I(0)

Source: Researcher computation
Note: I (0) Indicates non-stationarity at level.

Table 8. Unit Root Estimation by Augmented-Dicky Fuller Test at 1st difference

Variables	Calculated values at First difference	Null Hypothesis	Probability values	Remarks
LGDP	-4.366146	H0:Unit root	0.0014**	Stationary I(1)
DTGDP	-12.32802	H0:Unit root	0.0000**	Stationary I(1)
DTIT	-6.055274	H0:Unit root	0.0000**	Stationary I(1)

Source: Researcher computation
Note: I(1) denotes stationary at first difference, **indicate significance at 5%.

Similarly for Model-II, the stationarity of the variable has been checked by utilizing Augmented Dicky-Fuller test and results in above table-6 has described GDP, PI and PC are non-stationary calculated values of GDP, PI and PC are - 0.357353, 1.054 and -2.77 respectively which are less than the critical value at 5% level, so the hypothesis of unit root has not been rejected. After taking first difference all the variables became stationary.

Table 9. ARDL Long Run Relationship
Dependent Variable: LGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-0.139164	3.238040	0.04181	0.9660
$LGDP_{t-1}$	-0.133466	0.064067	-2.83230	0.0476
$LGINI_{t-1}$	1.040730	0.151200	2.31111	0.0432
LPI_{t-1}	0.090501	0.024646	3.67209	0.0011
LPC_{t-1}	0.126400	0.191146	0.66127	0.5145

R-square = 0.607, Adjusted R-square = 0.465 F-statistic = 4.293 (0.0018)*, Durbin-Watson stat = 2.038

The above table 9 results used the appropriate ARDL model, the dependent variable is GDP and the independent variables are GINI, PI and PC. The results indicate that GINI coefficient is positively related with the dependent variable GDP. When income inequality increases (decreases) Gross Domestic Products also increases (decreases). The t-statistic value (2.3111) which is greater than critical value and the probability value (0.04), suggests that Gini coefficient has significant positive impact on GDP. Coefficients of Private Investment represent positive and significant relationship with GDP suggested by its coefficient 0.090501 and t-calculated value 3.67209. And the Private Consumption shows positive but insignificant relationship with GDP. The results of the bounds co-integration test exhibit that the null hypothesis (there is no long run relationship) against its alternative hypothesis (there is long run relationship) is easily rejected at the 1% significance level. The computed F-statistic is 5. 992 which is greater than the upper critical bound value of 5.06, this is the concrete evidence for cointegration. And on the basis of given results we can conclude the existence of a steady state long run relationship among GDP, GINI, PI and PC. And the minimum imposed lag (1) was selected through AIC.

Table 10. ARDL Error Correction Model
Dependent Variable: D(LNGINI)

	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-0.020172	0.000950	-21.24406	0.0000
D(LGINI(-1)	-0.154125	0.017422	-8.846517	0.0000
D(LDTIT(-1)	-0.002987	0.000248	-12.04366	0.0000
D(LDTGDP(-1)	0.001941	0.000221	8.770574	0.0000
D(LGINI(-1)	-0.039627	0.001723	-23.00142	0.0000
D(DTIT(-1)	-0.001173	0.000258	-4.551541	0.0001
ECM(-1)	-0.77471	0.014207	70.35031	0.0000

R-squared	0.997554	Mean dependent var	0.009849
Adjusted R-squared	0.997048	S.D. dependent var	0.002608
S.E. of regression	0.000142	Akaike info criterion	-14.71330
Sum squared resid	5.82E-07	Schwarz criterion	-14.40540
Log likelihood	271.8394	Hannan-Quinn criter.	-14.60583
F-statistic	1971.122	Durbin-Watson stat	0.784529
Prob(F-statistic)	0.000000		

The coefficient of the Error Correction Mechanism indicate that how much fast the given variable move towards equilibrium from disequilibrium and the sign of the coefficient should be significant and negative for the existence of short run relationship . In the above table results (10) is the coefficient of Error Correction Mechanism (ECM). As for as interpretation is concerned, the coefficient value is very high that is 0.77 and highly significant meaning that the adjustment process from disequilibrium to equilibrium is very fast. Since we are using annual time series data so, therefore the system will take almost one year to reach their long run equilibrium

Discussion

During the 1950's and 1960's economists such as nichdas, kaldor and simon Kuznet maintained that before

world war-II phase, there was a tradeoff between increasing growth and reducing inequality, though East Asian economies had comparatively low level of inequality (for countries of comparable income level) and propagate of unparalleled rates. In sharp difference to this practice, a lot of Latin American countries and considerably higher level of inequality and grew at a part of the average East Asian rate. These trends support a path of significance in the association linking growth and inequality. Recently most of investigators work have developed models that calculate a positive connection between inequality and growth like [Gilles Saint Pant & Thierry Verdier (1993)] argue that in more uneven societies, the median Voter will elect a higher rate of taxation to business public education, which will boost aggregate human capital and monetary growth. Oded Galor & Daniel Isiddon (1997) investigated that GDP and income inequality are positively related.

Discussion of Model-1

Positive sign of direct taxes to GDP ratio shows a positive relationship between Gini coefficient and direct taxes to GDP ratio. In the context of Pakistan the implementation of progressive tax system has been subject to diverse impediments. Pakistan tax collection mechanism is one of the factors that leads to the failure of substantial government revenue.so that the revenue in turn can be utilized to enhance the standard of living of all people via decreased government spending. Politics dominates economics paradigm is well in Pakistan, and wealthy people influence government economic policies and try to alter the government policies in favor of their own benefits. Therefore, fiscal policies to increase tax rate always are opposed by economic-cum-political elites, and has been responsible for status-quo portrayed in the form of increased income inequality

Discussion of Model-2

In Pakistan Gini coefficient and Lorenz curve have been most frequently used in the fiscal policy thought for different inequality indications. In the urban areas Gini coefficient increased sharply from 0.3698 to 0.4068 over the year 1963-1967. Other than decline to 0.3694 by 0.3122 over the year 1963-1970 periods. In the rural areas income share of the richest 20% people declined from 43.18% to 39.87% and the poorer 20% increased from 7.35% to 8.54. In urban areas the poorest 20% lost the income share and the richest 20% add considerable over the period 1963-67. On average Gini coefficient increased from 1970's to 2010 for example in 1973 Gini coefficient was 0.30644 and in 1975 it increased 31.5586 and in 2000 it increased up to 40.8337 so that data shows overall increases in Gini coefficient. The income share of the poorest 20% declined marginally while the richest 20% increased significantly. It's clearly shows that the contribution of high income class in GDP increased as compared to the share of poor class in total production. we may note that this has been because the corporate income increases in developing countries like Pakistan which lead increase in saving and positive impact on the aggregate investment as a result its major share goes into the pocket of elite class, so its work in opposite direction it raise income inequality instead of decreasing inequality. The rate at which the income of corporate (elite class) increase is far high than the rate of increase in wage. However this has been the period when Pakistan follows stabilization program and structural modification. Throughout the world programs of such types have direct role in boosting the income inequality (Mahmood 2001). Two substitutes for structural fundamentals were included in modeling inequality i.e manufacturing to agriculture term of trade and developed to agriculture wage gap both turned out important and reveal a positive association with inequality. These are large clearly point out rural verses urban income inequalities and highlights the need for policy involvement in rural economy and agriculture sector.

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