ESTIMATING INCOME INEQUALITY IN PAKISTAN: HIES 1992-93 TO 2007-08

AHMED RAZA CHEEMA AND MAQBOOL H. SIAL[26]

Abstract

This study estimates Gini coefficient, Generalized Entropy and Atkinson's Indices in order to ascertain about income distribution using eight Household Income and Expenditure Surveys data collected by Federal Bureau of Statistics, Government of Pakistan from 1992-93 to 2007-08. The results show that inequality remained fluctuating during the period 1992-93 through 2001-02. After this increasing trend in it was observed up to 2005-06. But during 2005-06 and 2007-08 it decreased. Inequality was higher in urban areas as compared to rural areas in Pakistan. Among the provinces, it was highest in Sindh in 1992-93, whereas it was highest in Punjab from 1993-94 to 1998-99. After this, it was again highest in Sindh from 2001-02 to 2007-08. Punjab followed the same trend in inequality as was observed in overall Pakistan.

Keywords: GINI COEFFICIENT, GENERALIZED ENTROPY, ATKINSON INDEX, PAKISTAN

1. Introduction

Reducing poverty has been the main objective of the policy makers, yet it has attracted more attention since the Millennium Development Goals (MDGs) have been adopted. Poverty is negatively related with growth. But if during the growth process inequality increases, some of the growth effect is offset. In extreme cases, inequality increases so much that poverty increases even if the there is growth in the economy. Such like growth is regarded as 'Immiserising Growth' by Bhagwati (1988). Thus on the one side proper and accurate estimation of poverty is essential, while on the other side meaningful inequality estimation is also necessary. As long as poverty estimation is concerned, it has been estimated by Cheema and Sial (2012) for the period 1992-93 to 2007-08 in Pakistan. As far as inequality is concerned, the study finds that there are a lot of studies on inequality estimation, but some studies take individual, while the others choose household as a unit of analysis to estimate inequality. Some studies take consumption expenditure, while the others choose income as a welfare indicator. Different studies estimate different inequality measures. Of these inequality measures some are sensitive to changes in income at the lower tail, some at the upper tail, and still some at the middle. Thus, meaningful results can not be obtained. So it is necessary to obtain inequality estimates that are comparable. Thus this study want to estimate inequality in Pakistan using Household Income and Expenditure Surveys data from 1992-93 to 2007-08 which is the recent available survey data.

The paper is organized as follows: Following introduction, section 2 presents literature review, whereas the section 3 discusses data and methodologies employed. The results are presented in the section 3, while the final section draws some conclusions.

2. Literature Review

Nasim (1973) estimated the Gini coefficient to ascertain about inequality in Pakistan for the years 1962-63, 1996-67, 1968-69 and 1969-70. The unit of analysis was both individual and household. The study found that the inequality was higher in urban areas as compared with

---

[26] The authors are, respectively, Assistant Professor and Professor, Department of Economics, University of Sargodha.

rural areas. The inequality increased during 19963-64 and 1966-67. After this there was decreasing trend in it. Whereas Mahmood (1984) estimated the coefficient of variation, the Gini coefficient, Standard deviation of log income, Theil's index and Atkinson's index using the HIES data for the years 1963-64, 1966-67, 1968-69, 1`969-70, 1970-71, 1971-72 and 1979 for rural, urban and overall Pakistan. The study showed a decreasing trend in income inequalities for both rural and urban regions from 1963-64 to 1970-71 and after this a rising trend. This study also showed that inequality in income was more severe in urban area than in rural area.

Ahmed and Ludlow (1989) examined the trends in inequality estimates by estimating the Gini coefficient, coefficient of variation, Lorenz curve, Atkinson index and logarithmic variance during the period 1979 and 1984-85. The unit of analysis was both household and individual. All of the inequality measures showed an increase in inequality. Whereas Ahmed (2000) estimated the Gini coefficient, coefficient of variation, standard deviation of logs , Thiel's index and Atkinson's index using the micro data of household integrated economic survey (PIHS) for the year 1992-93. The unit of analysis was both household and individual. The Gini coefficient, when the unit of analysis was household, depicted that there was greater inequality (0.384) in rural area than in urban area (0.375). According to this study inequality among household was more than that among individuals. This study also estimated the same for overall provinces and urban/rural provinces using micro data. The inequality estimated from micro data was more in Sind and less in Baluchistan when household was the unit of analysis. There was more inequality in the rural areas than that in urban areas of Punjab and Baluchistan. In contrast, inequality was higher in the urban areas of Sindh and KPK than that in the rural areas. Inequality estimated from micro data when the unit of analysis was individual, was less than that when the unit of analysis was household for all overall provinces and urban/ rural provinces.

Federal Bureau of Statistics (2003) estimated the Gini coefficient and consumption ratio. According to theses measures, there was no systematic trend in inequality over the period. Inequality increased between 1992-93 and 1993-94, but it decreased between 1993-94 and 1996-97. Again during 1996-97 and 1998-99, it increased. But during 1998-99 and 2001-02 it decreased. Whereas Anwar (2003) estimated inequality measures, namely Lorenz curve and the Gini coefficient to find trends in inequality by making the use of Pakistan integrated household survey (PIHS) for 1998-99 and 2001-02. The study showed that there was a rise in inequality in Pakistan. The rising trend was supported by the Lorenz curve because it shifted below indicating more inequality. However, at the regional level inequality is quite different. In rural area it increased while it decreased in urban area. Inequality in all provinces except Sindh, decreased. But in Sindh it increased much.

Saboor (2004) estimated the measures of inequality namely, Theil index, Atkinson index, coefficient of variation, Atkinson and the Gini coefficient for the years 1990-91, 1992-93, 1993-94, 1996-97, 1998-99 and 2001-02. Over the period from 1990-91 through 1993-94 income inequality decreased, but after this it increased continuously. Anwar (2009) estimated the Gini coefficient using the Household Income and Expenditure Survey data for the period from 2001-02 to 2004-05 and showed that inequality increased in Pakistan. The study also depicted that it was more severe in urban areas as compared with rural areas. The study estimated consumption shares by deciles and showed that there was increase in inequality in Pakistan at the cost of the poor and the middle income groups. The study also estimated the

ratio of the richest decile to the poorest decile and depicted that the gap between the poor and the rich increased over the period

Thus the study finds that there are a lot of studies on inequality estimation, but some studies took individual, while the others chose household as a unit of analysis to estimate inequality. Some studies took consumption expenditure, while the others chose income as a welfare indicator. Different studies estimate different inequality measures. Of these inequality measures some are sensitive to changes in income at the lower tail, some at the upper tail, and still some at the middle. Thus, meaningful results can not be obtained. So it is necessary to obtain inequality estimates that are comparable.

3. Data and Methodology

3.1. DATA

This study utilizes the Household Income and Expenditure Survey (HIES) data for the years 1992-93, 1993-94, 1996-97, 1998-99, 2001-02, 2004-05, 2005-06 and 2007-08 collected by Federal Bureau of Statistics (FBS) Pakistan. Sample size determined by FBS is representative at national and provincial level with urban/rural break up. The detail of household covered during different years is reported in the table 1.

Table. 1 Households covered

Year	Sample size (Number of Households)		
	Rural	Urban	Pakistan
1992-93	9006	5586	14592
1993-94	9036	5632	14668
1996-97	8814	5447	14261
1998-99	9148	5523	14671
2001-02	9169	5536	14705
2004-05	8897	5807	14704
2005-06	9203	6234	15437
2007-08	9233	6235	15468

Source: Household income and expenditure surveys

3.2. Methodology

This study uses the consumption expenditure as a welfare indicator to estimate inequality in Pakistan. In the following section 3.2.1, it is shown how the consumption expenditure is

calculated, while in the 3.2.2 section inequality measures are presented to be estimated by this study.

3.2.1 Estimation of Consumption Expenditure

This study uses consumption expenditure as a welfare indicator. Consumption expenditures on all items consumed regardless of whether they were purchased or produced by own or got as assistance or gifts were added up to calculate monthly expenditure. Expenditures on fines, property and house taxes were not included. Different households have different sizes and compositions. One household may consists of more children, while the other may have more female member and still the other may include more adult members. Thus the adjustment of consumption expenditure is necessary to find the welfare at individual level. This study gives weight 1 to individuals whose ages are equal to or greater than 18 years and 0.8 to individuals who are less than it so that households' expenditures were divided by this per adult equivalent in order to know the true individual welfare level. These weights were used by World Bank (2002) and FBS (2001). The household Income and Expenditure Surveys spread over almost a year for their completion and they cover about all Pakistan. Thus different households living at different places face different prices. Two families with the same income but living at two different places certainly show different welfare levels. In order to address the price differential between urban and rural areas and among the provinces as well as across the year, Paasche Price idex estimated at primary sampling unit level is used. That index was was employed by FBS (2001) and World Bank (2002).

In order to adjust the inflation between the two survey years, Consumer Price Index (CPI) or Tornqvist Price Index (TPI) or Composite Price Index which is the combination of both can be used. This study uses Composite Price Index instead of CPI or T PI for the purpose for the following reasons: (1) Although CPI covers a large group of items (i.e. food and non-food), yet it includes prices from thirty five cities only. Since a large proportion of population of Pakistan is living in the rural areas, non-availability of the data on rural prices is likely to introduce bias in calculating true inflation rate which is the representative of the whole Pakistan. (2) Although Tornqvist price index (TPI) covers both urban and rural areas, yet it can not be calculated for non-food and non-fuel items for the reason that the HIESs do not provide enough information about them. (3) Composite Price covers both rural and urban areas as well as large number of items. This index was used in Bangladesh by World Bank (2001). For non-food and non-fuel items, consumer price indices estimated by Federal Bureau of Statistics, Government of Pakistan is utilized. As the HIES surveys provide enough information on food and fuel items, so Tornqvist price index is estimated for these items by this study which is given below:

Where
$$\ln P_{10} = \sum_{k=1}^{n} \frac{w_{1k} + w_{0k}}{2} \ln\left(\frac{p_{1k}}{p_{0k}}\right)$$

W_{1k} and w_{0k} are budget shares of items between the two periods – 1 and 0, whereas p_{1k} and p_{0k} are prices in the same two periods. By combining these two indices and using group weights of commodities and services developed by Government of Pakistan (2009), Composited Price Index is estimated to adjust inflation between two years.

.**3.2.2 Measuring Income Inequality**

Inequality can be measured in many ways. This study estimated the following inequality measures to find the inequality in Pakistan:

3.2.2.1 Gini Coefficient

An Italian statistician Corrado Gini developed an inequality measure called Gini coefficient. It is defined as a ratio of the area between the diagonal and the Lorenz curve to the total area of half square in which the curve lies (Todaro, 2002).
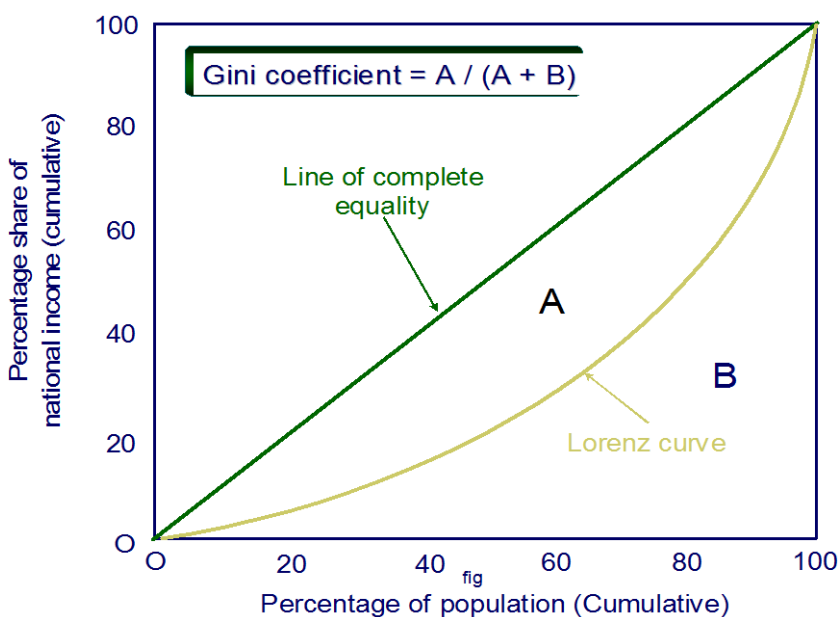
It is also defined as:

$$Gini = \frac{1}{2n^2\overline{Y}}\sum_{i=1}^{n}\sum_{j=1}^{n}\left|y_i - y_j\right|$$

Its value ranges between zero and one. The lower the value Gini coefficient has the more equal the distribution of income is. The higher the value the Gini coefficient has the more unequal the distribution of income is. Zero value of Gini coefficient shows perfect equality (every person has equal income) and one value shows perfect inequality (one person has all the income).

3.2.2.2 Generalized Entropy Measure

The Generalized Entropy class has the following general formula:

$$GE(\alpha) = \frac{1}{\alpha^2 - \alpha}\left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i}{\overline{Y}}\right)^{\alpha} - 1\right]$$

Where n is the individuals' number in the sample, y_i is the Individual i's income, i ∈ (1, 2…n) and $\bar{Y} = \left(\dfrac{1}{n}\right)\sum y_i$, the arithmetic mean income. The Values from 0 to ∞ can be taken by the Generalized Entropy measure, with zero showing an equal distribution (all incomes identical) and higher values show higher values of inequality. The parameter α in the GE class indicates the weight given to distances between incomes at different parts of the income distribution, and can take any real value. For lower values of α GE is more sensitive to changes in the lower tail of the distribution and for higher values GE is more sensitive to changes that affect the upper tail. The commonest values of α used are 0, 1 and 2: hence a value of α=0 gives more weight to distances between income in the lower tail, α=1 applies equal weights across the distribution, while a value of α=2 give proportionately more weight to gap in the upper tail. The GE measures with parameters 0 and 1 become with l'Hopital's rule, two of Theil's measure of inequality (Theil, 1967) - Mean log Deviation Measure (also known as Theil's L)and the Theil's T. Index respectively which are given below:

Theil's L Index or Mean Log Deviation Measure

$$GE(0) = \frac{1}{n}\sum_{i}^{n}\log\frac{\bar{Y}}{y_i}$$

Theil's T. Index

$$GE(1) = \frac{1}{n}\sum_{i=1}^{n}\frac{y_i}{\bar{Y}}\log\frac{y_i}{\bar{Y}}$$

Where
Notations have already been explained in the above Para.

3.2.2.3 Atkinson Index

Atkinson class has the following formula:

$$A_\varepsilon = 1 - \left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i}{\bar{Y}}\right)^{1-\varepsilon}\right]^{\frac{1}{(1-\varepsilon)}}$$

Where ε is the parameter of inequality aversion, 0 < ε<∞: the higher the value of ε, the more society is concerned about inequality. The less the value of ε the less the society is concerned about inequality. Zero value means that society is indifferent to inequality. The values from 0 to 1 can be taken by the Atkinson class, with zero value showing no inequality and one perfect inequality (Litchfield, 1999).

3.2.2.4 Axioms to be fulfilled by the Inequality Measure

Some apparently sensible measures behave in an unreasonable way. For example, the variance is not independent of the income scale: doubling all incomes would show quadrupling the estimate of income inequality. It is not a desirable property of inequality measure. An equality measure is required to satisfy the following a set of axioms:

The Pigou-Dalton Transfer Principle

According to this principle, transfer of income from a person who is poorer to a person who is richer should show a rise (or at least not a fall) in inequality and transfer of income from a person who is richer to a person who is poorer should show a fall (or at least not increase) in inequality. The class of Generalized Entropy, the Gini coefficient and the class of Atkinson meet this principle.

Income Scale Independence

According to this axiom, the inequality measures should be invariant to equal proportional changes. If the income of every individual changes by the equal proportion, then inequality should remain intact (Litchfield, 1999).

Principle of Population

According to this principle, inequality measures should be invariant to replications of the population: if two identical distributions are merged, then it should not change the inequality (Litchfield, 1999).

Anonymity

This axiom is some times regarded as 'symmetry'. According to this axiom Inequality measure is independent of individuals' any characteristic other than their income (Litchfield, 1999).

Decomposability

According to this axiom, overall inequality should be related consistently to constituent parts of the distribution like population sub-groups. For example, if inequality is viewed to rise among the every sub-group of the population, then overall inequality can be expected to rise too. Inequality measure-the Generalized Entropy class satisfies this principle (Litchfield, 1999).

4. Results

4.1 Inequality in Pakistan

 A literature review in Pakistan depicts that different studies employed different methods and chose different welfare indicator e.g. consumption expenditure or income. Their unit of analysis was also different e.g. population or household and covered the different time

periods. Thus, Inequality estimates estimated by these studies are not comparable and consistent. In order to find the true and exact inequality estimates and their exact trend, there is need to develop a consistent methodology, so that a suitable policy can be formulated. Inequality estimates across region from 1992-93 to 2007-08 are given in the Table 4.1.

Table 4.1: Inequality estimates in Pakistan from 1992-93 to 2007-08

Region/ Year	Generalized Entropy		Atkinson Indices			Gini coefficient
	G E (0)	G E (1)	A (0.5)	A (1)	A (2)	
1992-93						
Pakistan	0.1192	0.14542	0.0631	0.1124	0.1876	0.2685
Rural	0.0938	0.1100	0.0490	0.0895	0.1557	0.2388
Urban	0.1636	0.1988	0.0859	0.1510	0.2443	0.3170
1993-94						
Pakistan	0.1212	0.14543	0.0637	0.1142	0.1922	.2709
Rural	0.0912	0.1050	0.0474	0.0871	0.1537	0.2344
Urban	0.1523	0.1808	0.0793	0.1413	0.2329	0.3071
1996-97						
Pakistan	0.1134	0.1603	0.0622	0.1072	0.1770	0.2585
Rural	0.0908	0.1485	0.0518	0.0868	0.1442	0.2265
Urban	0.1333	0.1536	0.0689	0.1248	0.2107	0.2877
1998-99						
Pakistan	0.1504	0.1851	0.0793	0.1397	0.2301	0.3012
Rural	0.1044	0.1170	0.0534	0.0991	0.1761	0.2521
Urban	0.2092	0.2554	0.1087	0.1888	0.3002	0.3583
2001-02						
Pakistan	0.1245	0.1485	0.0652	0.1171	0.1979	0.2749
Rural	0.0906	0.0990	0.0461	0.0866	0.1558	0.2366
Urban	0.1693	0.2045	0.0883	0.1558	0.2549	0.3217
2004-05						
Pakistan	0.1453	0.1716	0.0754	0.1352	0.2290	0.2969
Rural	0.1044	0.1148	0.0530	0.0992	0.1796	0.2518
Urban	0.1856	0.2176	0.0953	0.1694	0.2794	0.3381
2005-06						
Pakistan	0.1489	0.1852	0.0780	0.1383	0.2251	0.3000
Rural	0.0974	0.1109	0.0503	0.0928	0.1638	0.2438
Urban	0.1957	0.2395	0.1023	0.1778	0.2820	0.3473
2007-08						
Pakistan	0.13757	0.16538	0.07218	0.12852	0.21302	0.2904
Rural	0.10558	0.12149	0.05478	0.10020	0.17305	0.25474
Urban	0.16921	0.20258	0.08804	0.15567	0.25380	0.32344
*Author's own calculation						

4.2 Inequality in urban, rural and overall Pakistan

The estimates of Gini coefficient are consistent with those of FBS (2003) and World Bank (2004). The table 4.1 depicts that the inequality remained fluctuating from 1992-93 through 2001-02 according to all of the inequality measures estimated by this study except GE (1) in Pakistan. After this there was increasing trend in inequality according to all inequality indices except A (2) up to 2005-06. After this it decreased in 2007-08. It is evident from the figure 4.1 in which the most widely used inequality measure- Gini coefficient is presented.

Figure 4.1: Gini Coefficient For Urban, Rural and Overall Pakistan Over Time
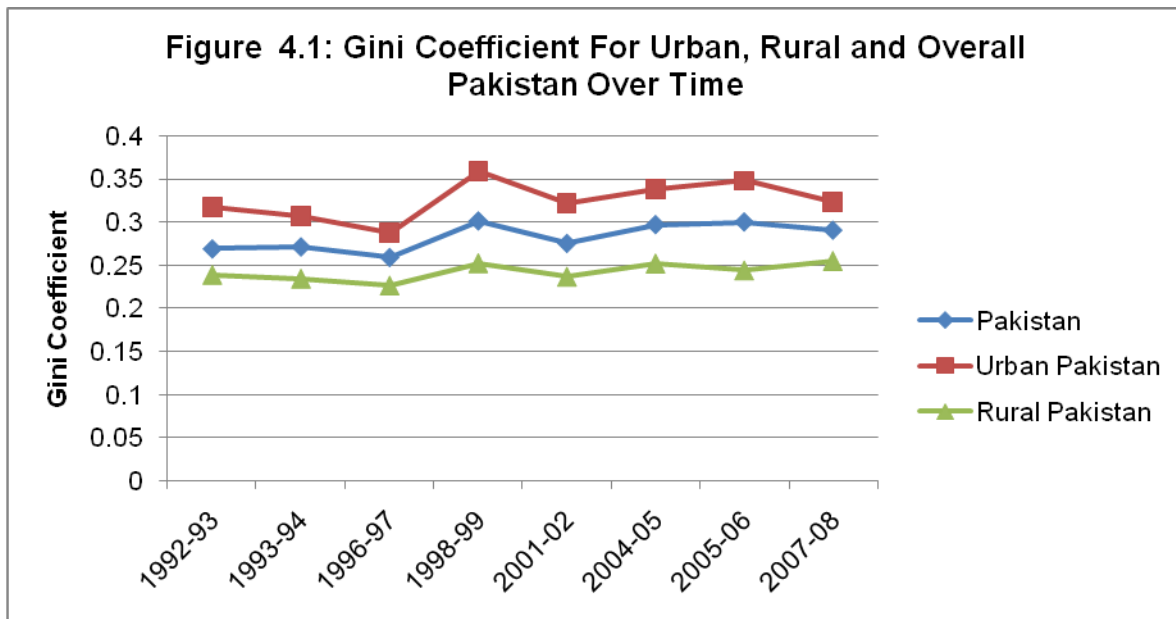
Inequality was highest in 1998-99 according to all of inequality measures except G (1) and it was lowest in 1996-97. As far as inequality in urban and rural areas is concerned, the results show that it was higher in urban areas as compared to rural areas (see figure 4.1). During 1992-93 through 1996-97 inequality decreased in both rural and urban areas according to all of the inequality measure measures except GE (1) and A (0.5) in rural area during 1993-94 and 1996-97. But between the period from 1996-97 and 1998-99, it increased in both areas. Again it decreased during 1998-99 and 2001-02. After this increasing trend in it was observed continuously up to 2005-06. After this there were different trends in inequality in rural and urban areas. It increased in rural area, but it decreased in urban areas. It can be said that inequality decreased in overall Pakistan because of reduction in inequality in urban areas. The curves representing urban areas are steeper than those representing rural areas showing that inequality increased and decreased at a faster rate in urban area as compared to rural area throughout the period.

4.3 Inequality by Province

It is usefull to disaggregate the inequality estimates at province as well as at rural/urban level sothat a proper policy can be chalked out to addreess the problem. Inequality estimates for rural/urban and overall provinces are presented in the table 4.2.
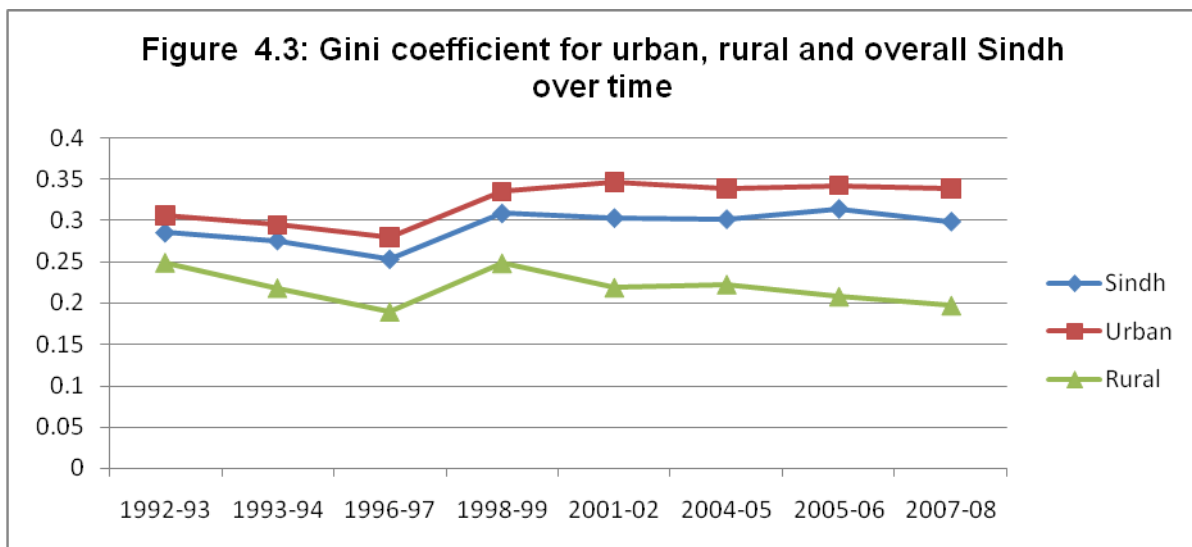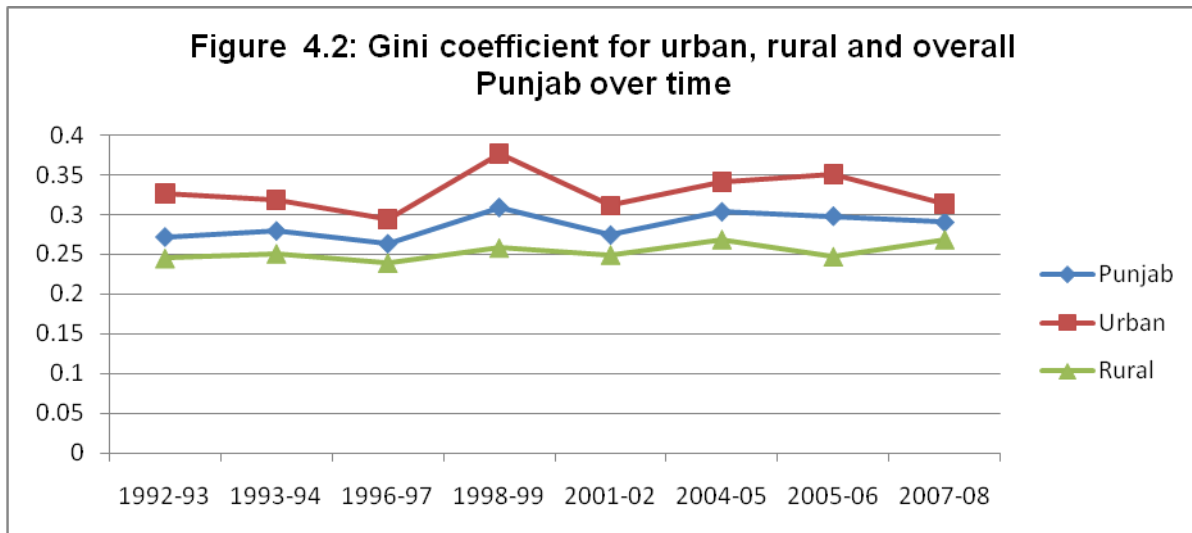
Table 4.2: Inequality estimates by province from 1992-93 to 2007-08

Generalized entropy measure			Atkinson Indices			Gini coefficient
Region/year	GE (0)	GE (1)	A (0.5)	A (1)	A (2)	
1992-93						
Punjab	0.1218	0.1456	0.06389	0.1146	0.1934	0.2722
Rural	0.09729	0.10951	0.04998	0.0927	0.16428	0.24482
Urban	0.17312	0.21266	0.09110	0.1590	0.25425	0.32606
Sindh	0.1346	0.1666	0.0715	0.1260	0.2069	0.2848
Rural	0.10486	0.13341	0.05639	0.0995	0.16705	0.24822
Urban	0.15257	0.18164	0.07962	0.1415	0.23267	0.30626
KPK*	0.0803	0.1027	0.0437	0.0772	0.1287	0.2145
Rural	0.06668	0.08446	0.03620	0.0645	0.10943	0.19515
Urban	0.14625	0.17604	0.07659	0.1361	0.22525	0.29862
Baluchistan	0.074	0.0738	0.0344	0.0652	0.1196	0.2038
Rural	0.06420	0.06950	0.03264	0.0622	0.11541	0.19896
Urban	0.08821	0.10051	0.04585	0.0844	0.14641	0.23371
1993-94						
Punjab	0.1289	0.1528	0.0673	0.1209	0.2043	0.2798
Rural	0.10332	0.11801	0.05332	0.0982	0.17297	0.25056
Urban	0.16321	0.19318	0.08477	0.1506	0.24629	0.31774
Sindh	0.1252	0.1519	0.0660	0.1177	0.1970	0.2754
Rural	0.08059	0.09333	0.07331	0.0774	0.13839	0.21751
Urban	0.14013	0.16813	0.07331	0.1307	0.21664	0.29458
KPK	0.0756	0.0883	0.0398	0.0728	0.1264	0.2127
Rural	0.05862	0.06528	0.03030	0.0569	0.10310	0.18831
Urban	0.13513	0.15499	0.06975	0.1264	0.21202	0.29123
Baluchistan	0.0710	0.0822	0.0371	0.0686	0.1215	0.2073
Rural	0.06630	0.07670	0.03466	0.0641	0.11439	0.20014
Urban	0.08194	0.09356	0.04262	0.0787	0.13761	0.22484
1996-97						
Punjab	0.1202	0.1851	0.0674	0.1132	0.1840	0.2637
Rural	0.10298	0.18560	0.06042	0.0979	0.15853	0.23894
Urban	0.13986	0.16406	0.07271	0.1305	0.21778	0.29362
Sindh	0.1038	0.1190	0.0539	0.0986	0.1691	0.1038
Rural	0.05800	0.06140	0.02934	0.0563	0.10521	0.18876
Urban	0.12442	0.13956	0.06373	0.1170	0.20037	0.27971
KPK	0.0802	0.1044	0.0438	0.0770	0.1292	0.2147
Rural	0.07122	0.09520	0.03925	0.0687	0.11589	0.20049
Urban	0.11142	0.12874	0.05792	0.1054	0.17979	0.26271
Baluchistan	0.0711	0.0770	0.03618	0.0686	0.1258	0.2091
Rural	0.06076	0.06359	0.03056	0.0589	0.11053	0.19404
Urban	0.08580	0.09571	0.04400	0.0822	0.14800	0.22892
1998-99						
Punjab	0.1577	0.1938	0.08375	0.1459	0.2394	0.3090
Rural	0.10817	0.11941	0.05502	0.1025	0.18252	0.25788
Urban	0.23002	0.28026	0.11889	0.2055	0.32368	0.37608
Sindh	0.1580	0.1977	0.0838	0.1461	0.2376	0.3080
Rural	0.10333	0.12180	0.05386	0.0982	0.17225	0.24762
Urban	0.18319	0.22637	0.09631	0.1674	0.26701	0.33495
KPK*	0.1195	0.1418	0.0626	0.1127	0.1914	0.2681
Rural	0.09473	0.10629	0.04865	0.0904	0.16093	0.23990
Urban	0.20124	0.23486	0.10310	0.1823	0.29514	0.35239
Baluchistan	0.08297	0.0992	0.0454	0.0846	0.1512	0.2314
Rural	0.08518	0.09540	0.04379	0.0816	0.14669	0.22681
Urban	0.10820	0.12155	0.05553	0.1025	0.17963	0.25837
2001-02						
Punjab	0.1229	0.1390	0.0629	0.1156	0.2014	0.2746
Rural	0.10046	0.10873	0.05078	0.0956	0.17237	0.24916
Urban	0.15725	0.17953	0.08023	0.1455	0.24803	0.31089
Sindh	0.1536	0.1983	0.0827	0.1424	0.2271	0.3024
Rural	0.07621	0.08007	0.03826	0.0734	0.13589	0.21813

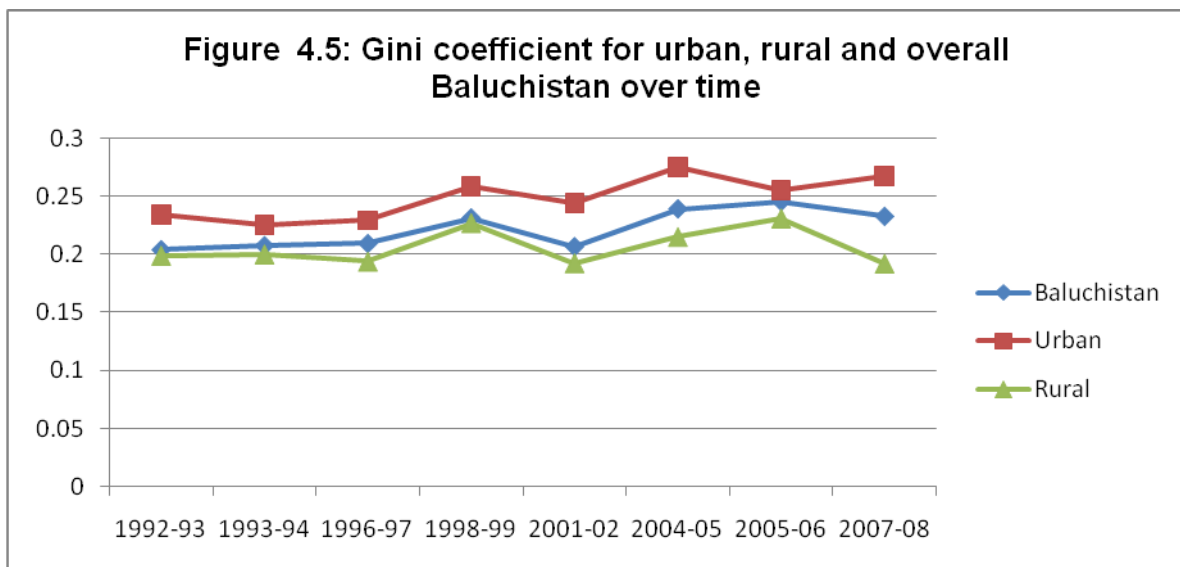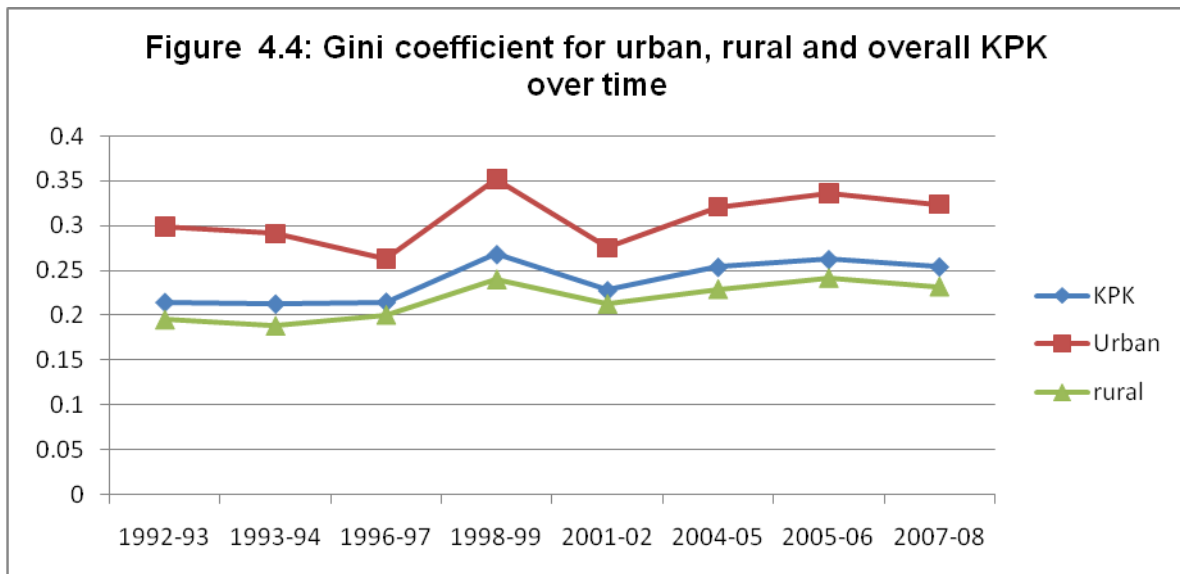|						
Urban	0.19703	0.25078	0.10477	0.1788	0.27681	0.34652
KPK	0.0851	0.0982	0.0445	0.0816	0.1411	0.2277
Rural	0.07456	0.08506	0.03886	0.0718	0.12624	0.21281
Urban	0.12118	0.13699	0.06230	0.11412	0.19534	0.27542
Baluchistan	0.0685	0.0758	0.0352	0.0662	0.1189	0.2065
Rural	0.05945	0.06492	0.03047	0.0577	0.10518	0.19262
Urban	0.09464	0.10349	0.04812	0.0903	0.16154	0.24357
2004-05						
Punjab	0.1504	0.1755	0.0775	0.1396	0.2363	0.3036
Rural	0.11745	0.13019	0.05970	0.11082	0.19615	0.26861
Urban	0.18753	0.21840	0.09581	0.1710	0.28348	0.33997
Sindh	0.1512	0.1838	0.0794	0.1403	0.2339	0.3010
Rural	0.08339	0.08912	0.04193	0.0800	0.15293	0.22176
Urban	0.18593	0.22068	0.09613	0.1697	0.27550	0.33831
KPK	0.1079	0.1227	0.05548	0.1023	0.1828	0.2539
Rural	0.08700	0.09219	0.04362	0.0833	0.15694	0.22898
Urban	0.16836	0.19761	0.08679	0.1549	0.25925	0.32115
Baluchistan	0.0946	0.1011	0.0476	0.0903	0.1663	0.2393
Rural	0.08039	0.08412	0.04011	0.0772	0.14667	0.21941
Urban	0.12097	0.12724	0.06021	0.11394	0.20523	0.27511
2005-06						
Punjab	0.1472	0.1822	0.0779	0.1368	0.2236	0.2982
Rural	0.10071	0.11637	0.05222	0.0958	0.16798	0.24703
Urban	0.19899	0.24096	0.10345	0.1804	0.28729	0.35053
Sindh	0.1628	0.2087	0.0873	0.1503	0.2378	0.3134
Rural	0.06926	0.07361	0.03501	0.0669	0.12364	0.20727
Urban	0.19064	0.23789	0.10063	0.1736	0.27261	0.34240
KPK	0.1121	0.1334	0.0590	0.1061	0.1779	0.2625
Rural	0.09390	0.10672	0.04868	0.0896	0.15535	0.24151
Urban	0.18210	0.22104	0.09524	0.1665	0.26501	0.33640
Baluchistan	0.0972	0.1060	0.0493	0.0926	0.1660	0.2456
Rural	0.08587	0.09362	0.04364	0.0823	0.14918	0.23079
Urban	0.10421	0.11138	0.05242	0.0990	0.17798	0.25513
2007-08						
Punjab	0.13697	0.15969	0.07090	0.12800	0.21638	0.29054
Rural	0.11679	0.13297	0.06013	0.11023	0.19078	0.26848
Urban	0.15842	0.18534	0.08174	0.14651	0.24420	0.31285
Sindh	0.14790	0.19049	0.07986	0.13748	0.21678	0.29819
Rural	0.06266	0.06835	0.03213	0.06074	0.11014	0.19646
Urban	0.18527	0.22979	0.09769	0.16912	0.26600	0.33834
KPK	0.10716	0.13077	0.05714	0.10162	0.16789	0.25428
Rural	0.08885	0.10562	0.04700	0.08502	0.14436	0.23198
Urban	0.16931	0.20263	0.08845	0.15576	0.24980	0.32407
Baluchistan	0.08677	0.09529	0.04438	0.08311	0.14780	0.23272
Rural	0.05828	0.06036	0.02922	0.05662	0.10640	0.19223
Urban	0.11421	0.12103	0.05713	0.10793	0.19356	0.26708
*KPK Stands for Khyber Pakhtoon Khaw. This is new name for this province. Its old name was North Western Frontier Province (NWFP)						

*Author's own calculation

The table shows that inequality in Punjab showed the same trend that was observed in overall Pakistan throughout the period under consideration. This is clear from the figure 2. Inequality was higher in urban areas as compared to rural areas. The difference in inequality between urban and rural areas was highest in 1998-99, while it was lowest in 2007-08 in Punjab. As far as Sindh is concerned , inequality followed the same trend that was in Punjab and Overall Pakistan from 1992-93 to 1998-99. Urban and rural areas in Sindh showed different trends from 1998-99 to 2005-06. During 1998-99 and 2001 there was increasing trend in urban area, while in rural area there was decreasing trend in it. During 2001-02 and 2004-05 the situation

was different i.e. urban areas depicted the decreasing trend, but rural areas showed increasing trend. But during 2004-05 and 2005-06 the situation was opposite to the previous one. During 2005-06 and 2007-08 both urban and rural areas showed the decreasing trend. Difference in inequality between urban and rural areas is increasing continuously after 1998-99. All this is clear from the figure 3.


Figure 4.2: Gini coefficient for urban, rural and overall Punjab over time

Figure 4.3: Gini coefficient for urban, rural and overall Sindh over time

There was no systematic trend in inequality in KPK from 1992-93 to 2001-02. During 1992-93 and 1993-94 rural, urban and overal KPK showed the declining trend. But between 1993-94 and 1996-97 inequality increased in overall KPK, but urban and rural areas depicted different trends. It increased in rural areas, while it decreased in urban areas. During 1996-97 and 1998-99 rural, urban and overall KPK showed the increasing trend. But between 1998-99 and 2001-02 it depicted decreasing trend. Between 2001-02 and 2005-06 there was increasing trend in inequality in rural, urban and overall KPK. During 2005-06 and 2007-08 inequality decreased in rural, urban and overall KPK. As far as Baluchistan is concerned, according to all of the inequality measures there was increasing trend in inequality from 1992-93 to 2005-06 except between 1998-99 and 2001-02. After this period, inequality decreased in

overall Baluchistan. As far as urban and rural areas are concerned, there was fluctuating trend in inequality. Inequality was higher in urban areas than that in rural areas.

Figure 4.4: Gini coefficient for urban, rural and overall KPK over time

Figure 4.5: Gini coefficient for urban, rural and overall Baluchistan over time

lo
l

Inequality estimates were higher in Punjab and Sindh as compared to KPK and Baluchistan in all the years as is evident from figure 6. To make the figure simple, the estimates of only one measure- Gini coefficient that is most widely used measure are presented.

Figure 6: Gini coefficient by province in Pakistan over time
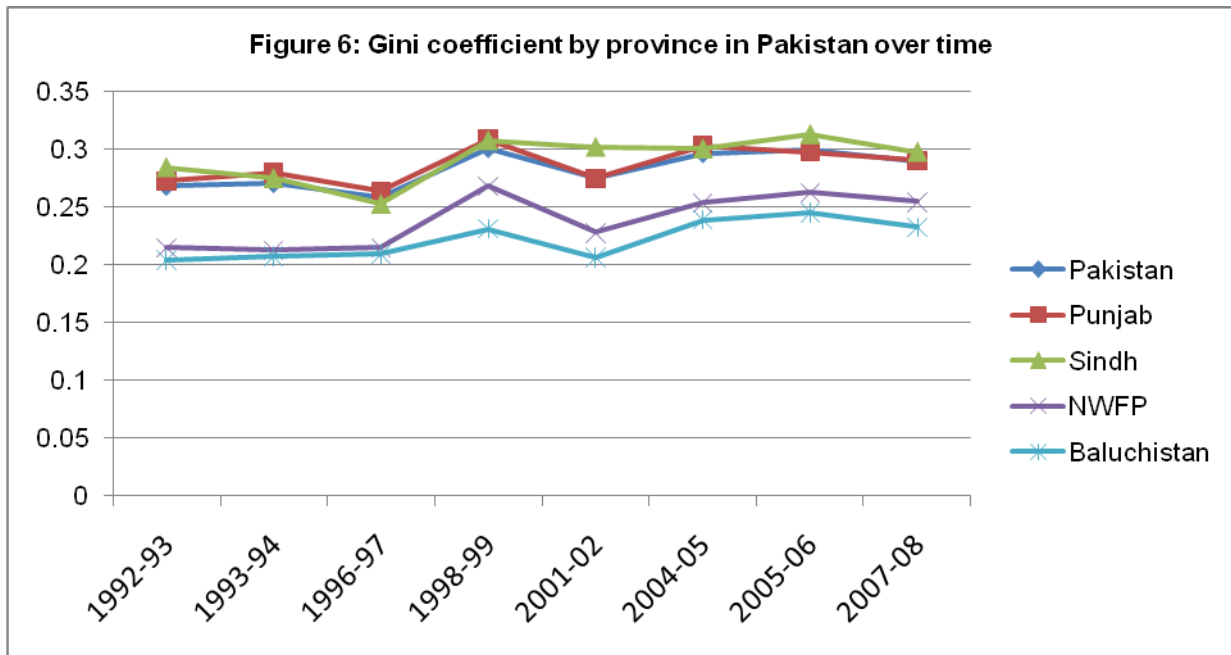
5. Conclusion

This study calculates Gini coefficient, Generalized entropy and Atkinson index to know about income inequality in Pakistan utilizing Household income and expenditure survey data from 1992-93, 1993-94, 1996-97, 1998-99, 2001-02, 2004-05, 2005-06 and 2007-08. The results depict that Inequality remained fluctuating from 1992-93 through 2001-02. After this there was increasing trend in it up to 2005-06. But between the period from 2005-06 and 2007-08, it reduced. Urban areas experienced severe inequality than rural areas throughout the period under consideration. Among the province, it was highest in Sindh in 1992-93, whereas it was in Punjab from 1993-94 to 1998-99. After this it was again highest in Sindh from 2001-02 to 2007-08.

The trend of inequality in Punjab was the same as was observed in overall Pakistan throughout the period under consideration. The urban Punjab experienced more severe inequality than rural Punjab. The difference in inequality between urban and rural areas was highest in 1998-99, while it was lowest in 2007-08 in Punjab. As far as Sindh is concerned , the same trend in inequality was observed in it as was experienced in Punjab and Overall Pakistan from 1992-93 to 1998-99. There were different trends in inequality in Urban and rural areas of Sindh from 1998-99 to 2005-06. During 1998-99 and 2001 there was increasing trend in urban area, while in rural area there was decreasing trend in it. During 2001-02 and 2004-05 the situation was different i.e. urban areas depicted the decreasing trend, but rural areas showed increasing trend. But during 2004-05 and 2005-06 the situation was opposite to the previous one. During 2005-06 and 2007-08 both urban and rural areas showed the decreasing trend. Difference in inequality between urban and rural areas is increasing continuously after 1998-99.

 No systematic trend in inequality in KPK was observed from 1992-93 to 2001-02. The decreasing trend in inquality was experienced during 1992-93 and 1993-94 in rural, urban

and overal KPK. But inequality increased in overall KPK during 1993-94 and 1996-97, but rural and urban areas showed different trends. It increased in rural areas, while it decreased in urban areas. There was increasing trend during 1996-97 and 1998-99 in rural, urban and overall KPK. But between 1998-99 and 2001-02 there was decreasing trend in inequality. Between 2001-02 and 2005-06 there was increasing trend in inequality in rural, urban and overall KPK. During 2005-06 and 2007-08 inequality decreased in all the three regions- rural, urban and overall KPK. As far as Baluchistan is concerned, according to all of the inequality measures there was increasing trend in inequality from 1992-93 to 2005-06 except between 1998-99 and 2001-02. After this period, inequality decreased in overall Baluchistan. As far as urban and rural areas are concerned, there was fluctuating trend in inequality. Inequality was higher in urban areas than that in rural areas.

References

Ahmad, M., (2000), "Estimation and Distribution of Income in Pakistan, Using Micro Data", *The Pakistan Development Review* 39:4, 807–824.

Ahmad, E. and S. Ludlow (1989), "Poverty inequality and growth in Pakistan". *The Pakistan Development Review*, Volume 28(4), pp. 831-850.

Anwar, T., (2003), "Trends in inequality in Pakistan between 1998-99 and 2001-02", *The Pakistan development review*: 42:4part-II pp 809-821.

Anwar, T., (2009), "Measuring Inequality of consumption and Opportunities in Pakistan 2001-02 and 2004-05", *Pakistan Economic and Social Review,* Vol 47, No. 2 pp. 157-181.

Bhagwati, J. N., (1988). Poverty and Public Policy. *World Development*, Vol.16, No. 539-654.

Cheema, A.R. (2010). An analysis of Relationship among Poverty, Inequality and growth in Pakistan. A PhD Thesis submitted to the Department of Economics, University of Sargodha, Sargodha.

Cheema, A.R. and Sial M.H. (2010). Estimating the contributions of Growth and Redistribution to changes in Poverty in Pakistan. *Pakistan Economic and Social Review,* Volume 48, No. 2 (Winter 2010), pp. 279-306.

Federal Bureau of statistics, (1992-93 to 2007-08), "Micro data files", Statistics Division, Islamabad.

Federal Bureau of statistics, (2001), "poverty in the 1990s", Statistics Division, Islamabad.

Litchfield, (1999), "Inequality: Methods and Tool", (Text for the World Bank Poverty) Net website: http://www.world bank.org/poverty.

Federal Bureau of Statistics, (2003),"how poverty increased", Islamabad

Federal Bureau of Statistics, (2009),"Monthly Review on Price Indices", Statistics Division, Government of Pakistan, Islamabad/Karachi.

Mahmood, Z.,(1994), "Income Inequality in Pakistan: An analysis of Existence of Evidence", *The Pakistan Development Review*, Vol. XXIII Nos. 2 & 3.

Naseem, S. M. (1973), "Mass poverty in Pakistan: Some preliminary findings".*Pakistan Development Review*, Volume 12(4), pp. 317-360.*Pakistan Development Review* 12:4, 312–360.

Saboor, A., (2004), "Agricultural Growth, Rural Poverty and Income Inequality in Pakistan: a Time Series Analysis", Department of Agricultural Economics, *University of agriculture*, Faisalabad, Pakistan.

Todaro,M. P. and Smith, S.C., (2002), *Economic Development,* 8th edition. Addison Wesley.

World Bank (2001), "Growth, Poverty and Inequality in Bangladesh", Poverty Reduction and Economic Management Unit, South Asia Region, World Bank, Washington DC.
World Bank, (2002), "*Pakistan Poverty Assessment",* Islamabad.