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Does Price Level Increase Income Inequality in Pakistan? A Disaggregated Analysis

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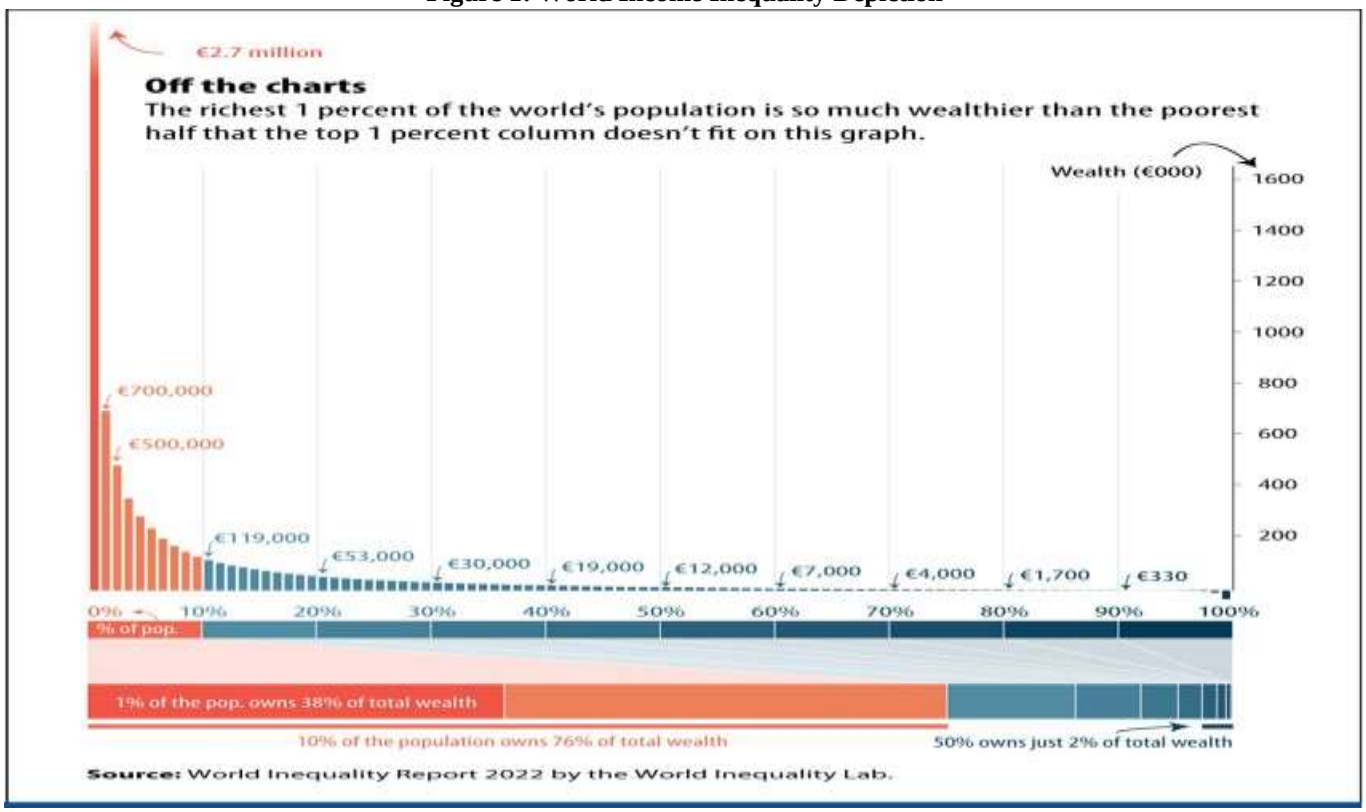
Abstract
The crucial emphasis of economic policies is to enhance socio-c wellbeing of the people in an economy. If the society is economically polarized it hampers the impact of economic policies. The crucial economic problem about which fewer economists gutsy to talk is income inequality in the world because it is the answer to a pinching question that who will benefits from the economic growth in an economy. Despite the generation of trillions of dollars each year in the world, a huge population is deprived of basic needs such as food, sanitation, security, health and education etc. When it comes to the effect of inflation on masses the situation further aggravates. Escalated price levels deprive more people from essential goods and lead towards increasing income inequality. This study has tried to estimate the impact of inflation on income distribution in Pakistan. The data was collected from Pakistan Economic Survey and Handbook of Statistics by SBP for a period of 1990 to 2022. The present study has applied Auto Regressive Distributed Lag Model (ARDL) to estimate the linkage among price levels and income inequality in Pakistan. The findings of the study have revealed both positive and negative linkage among constituents of the CPI and the income inequality. The novelty of this study is on two grounds. Firstly, the study has dissolved Consumer Price Index (CPI) into its constituents, and their Impact on income inequality has been examined, as far as finest information available to us this has never been investigated in Pakistan before. Secondly, the study has applied two proxies the GINI coefficient and Mean Log Deviation (MLD) to estimate income inequality. Thirdly, we have applied the data splicing method[4] to make one base year of CPI from various base years that has been changed over the past years in Pakistan. The study offers some useful policy implications for policy formulation in Pakistan.

Keywords: income inequality, price level, economic growth

1. Introduction

Income inequality is the uneven distribution of income of an economy among its masses (Todaro, 2012). Income inequality is the cruel yet neglected reality of the world. The distribution of income turns out to be so uneven that people with the same race, language, colour, and ethnicity who share even the same social values have been living in two worlds. The condition of world income inequality is in such a deplorable plight that 40 % of world's wealth is grabbed by 1% richest class (Oxfam, 2013). The Impact of such dual worlds is that at one side necessities and luxuries of life such as sophisticated health facilities, education, food, apparels, self-esteem, luxury vehicles and foreign tours etc. are abundant for elite class and the vice versa for the poor class. The figure 1 below shows disparities in the world are at their extreme. The poorest half of the world population receives 2% of world's wealth which is € 2900[5](IMF-2022). On the other hand top 10% of world population receives 76% of world's wealth which is 190 times more than the poor half of the world [6](IMF-2022). In this situation the ultimate luxury for the poor class is bread and butter of two times a day. Income inequality is one the hardest challenges human race is facing nowadays.

Figure 1: World Income Inequality Depiction



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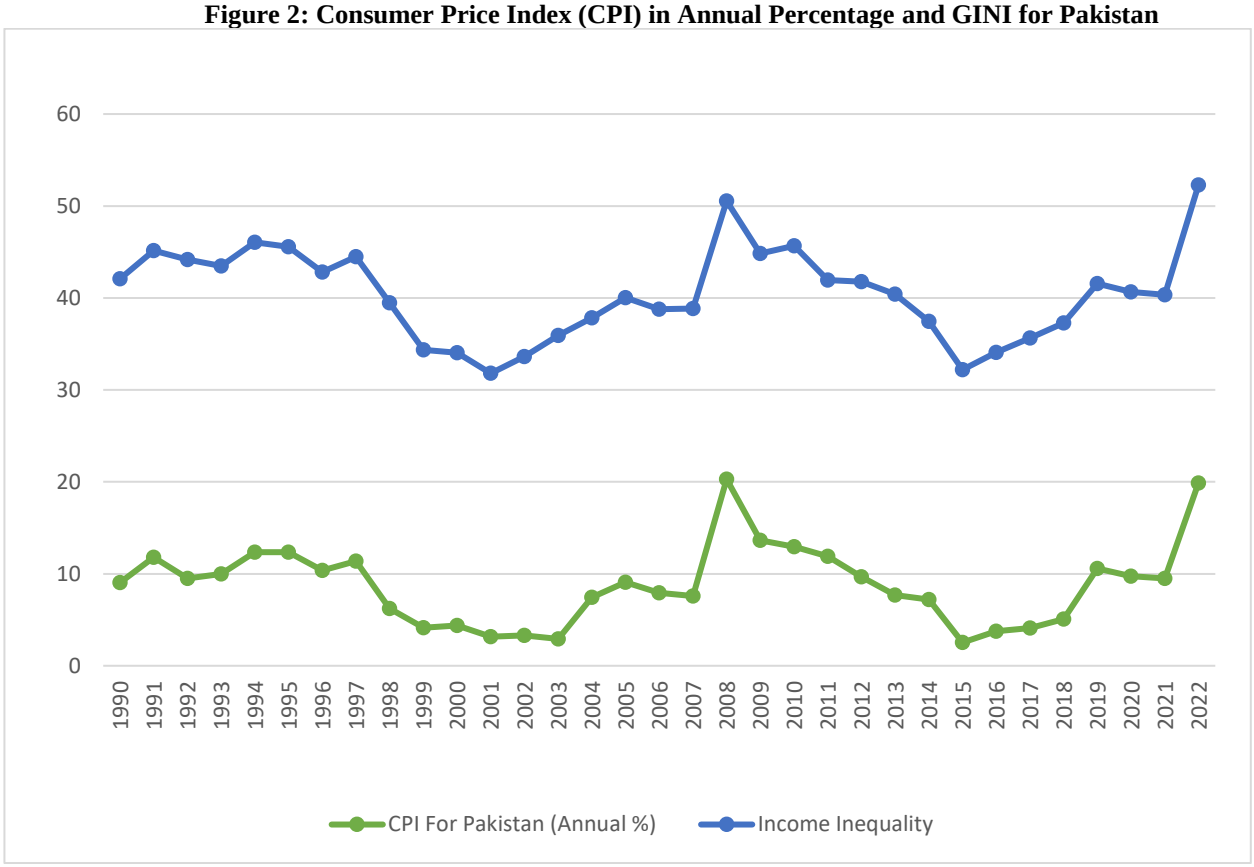
[4] The conversion of two different base years into one base year is called data splicing (Asteriou and Hall, 2007).
[5] https://www.imf.org/en/Publications/fandd/issues/2022/03/Global-inequalities-Stanley
[6] https://www.imf.org/en/Publications/fandd/issues/2022/03/Global-inequalities-Stanley

The developing economies are in the trap of vicious circle of poverty. The inflation further increases this gap. Developing countries, the chasm of income inequality is growing every passing day due to inflation and their traditional production structure that benefits the rich class only. The products that are being produced are basic needs and the masses are bound to buy them at escalated prices due unavailability of alternatives or competing products. This is how, the rich's wealth accumulates, which creates more deprivations every passing day (Albanesi, 2002; Hasan & Sadat, 2023). Income inequality cause vicious circle of poverty (VCP) to worse. When the people in an economy have already insufficient resources the escape the VCP inflation snitches such meagre income from the people and thus the trap of VCP becomes tougher to escape. People do not have resources to save and invest (Bauer, 1965; Ali, 2018; Ali et al., 2021).

Inflation is another grief of emerging markets and developing economies. Pakistan as a developing country is also facing galloping income inequality problem. The higher inflation the higher the gap between poor and the rich (Deyshppriya, 2017; Ullah & Ali, 2024). Top 1% of the population having 30.2% of entire country's resources (Ahmed, 2015). Dr Mehboob Ul Haq is of the view that 66 per cent of the resources of Pakistan were under the control of sixty-six families in the 1960s. Pakistan has also scored 139th out of 193 nations in Commitment to Reduce Inequality Index (CRI) (Oxfam, 2017).

Figure 2: Consumer Price Index (CPI) in Annual Percentage and GINI for Pakistan



Source: World Development Indicators

Figure 2 above secular trend elaborates how inflation and income inequality increase over the period of time wreaking havoc upon citizens of Pakistan. Citizens are facing dire impact of inflation and income inequality on their incomes. The low-income levels and escalating inflation have impaired the purchasing power that has made challenging task to afford basic needs. In the presence of high-income inequality any effort made by policy managers to increase income levels in an economy remains inept.

2. Review of Assorted Literature

The review of assorted literature gives insight of reasons of the widening gap between poor and the rich of the society. The tsunami of inflation has reduced the purchasing power of the people and enhance the deprivations Jacoby (2019). The study has investigated the influence of constituents of CPI on income inequality in Pakistan. The related review of the studies is summarized in Table1.

Inflation performs like a cannibal because it eats its own kind. The positive association between inflation and income inequality is revealed by past literature. Rising inflation dwindles the amount of goods and services available to consumer and creates the scarcity. Inflation deprives masses of an economy from essentials of life such as health, education, clean water, sanitation and even justice etc. The review of the literature highlights many factors for the increasing income inequality such as mal governance, untargeted subsidies, political and social inclined economic policies because the people on the top of income pyramid influence policymakers. The preceding studies has also manifested negative association between inflation and income inequality. The reasons for the paradox results may be well-targeted subsidies, a better system of indexation, the negotiation power of workers, trickle-down effects. These may cause reduced income inequality despite skyrocketing inflation in the economy.

Table 1: Summary of selected Studies on constituents of CPI and Income Inequality

Author(s)	Country	Measurement of Price Level	Methodology	Dependent Variable	Results
Achdut and Bigman (1991)	Israel	CPI	Sen(1976) Measure and Foster et al (1984)	Gini	Gini (-)
Son and Kakwani (2006)	Brazil	Price Indices	Price Index For Poor	Gini	Gini (+)
Albanesi (2007)	Cross Countries	CPI	Ordinary Least Squares	Gini	Gini (-)
Khattak (2014)	Pakistan	CPI	Johnsen Cointegration Model	Gini	Gini (+)
Ali (2014)	Pakistan	CPI	Johnsen Cointegration Model	Gini	Gini (+) Gini (-)
Foster and Kleit (2015)	USA	Price Indices	Price Indices	Gini	Gini (-)
Hudson and Namini (2015)	Cross Countries	CPI	Ordinary Least Squares	Gini	Gini (+)
Ge and Wu (2016)	China	CPI	Ordinary Least Squares	Gini	Gini (-)
Deyshappriya (2017)	Cross Countries	CPI	Generalized Method of Moments	Gini	Gini (+)
Chu and Cozzi (2018)	Cross Countries	Price Indices	Schumpeterian Quality-Ladder Model	Gini	Gini (-)
Jacoby (2019)	India	CPI	Ordinary Least Squares	Gini	Gini (+)
Arshad (2019)	Pakistan	CPI	Auto Regressive Distributed Lag Model	Gini	Gini (+) Gini (-)
Zheng (2020)	Cross Countries	Price Indices	Schumpeterian Model	Gini	Gini (-)
Memon and Qureshi (2021)	Cross Countries	Price Indices	Price Indices	Gini	Gini (+)
Altunbas and Thornton (2022)	Cross Countries	CPI	Fixed Effects Panel Estimation	Gini	Gini (+)
Kim and Lin (2023)	Cross Country	CPI	Generalized Methods Of Moments	Gini	Gini (+)
Mumtaz and Hussain (2024)	Pakistan	CPI	Regression	Gini	Gini (+)

3. Model Specifications

The model specifications are illustrated as under.

The Models

The disaggregated econometric models reveal the linkage of disaggregated CPI with GINI and Mean Log Deviation (MLD).

Model 1: GINI with disaggregated CPI

$$GINIC = \phi_1 + \phi_2 AFP + \phi_3 HP + \phi_4 ERP + \phi_5 RP + \phi_6 CPAP + \phi_7 MSP + \phi_8 GRP + \phi_9 FBP + \phi_{10} HFP + \phi_{11} TP_t \quad \textbf{(1)}$$

Model 2: MLD with disaggregated CPI

$$MLD = \phi_1 + \phi_2 AFP + \phi_3 HP + \phi_4 ERP + \phi_5 RP + \phi_6 CPAP + \phi_7 MSP + \phi_8 GRP + \phi_9 FBP + \phi_{10} HFP + \phi_{11} TP_t \quad (2)$$

Where:
MLD = Mean Log Deviation
GINIC = Gini Coefficient
AFP= Apparels and Footwear Price Level
HP = House Rent Price Level
ERP = Energy Price Level
RP = Recreation and Education Price Level
CPAP = Cleaning and Personal Appearance Price Level
MSP = Miscellaneous Expenditures Price Level
GRP = General Price Level
FBP = Food and Tobacco Price Level
HFP = House Equipments Price Level
TP = Transportation Price Level

4. Data and Methodology

The data of constituents of CPI are gathered from Pakistan Economic Survey from 1990-2022. Year 2001 was the base year for price level, and the data splicing method was applied to convert the changing base year by the Government of Pakistan to the same base year to compare it with different constituents of CPI. The study has employed Gini Coefficient and MLD as proxy of income inequality. The data on the Gini coefficient and MLD for Pakistan are collected by trading economics[7] and quandle[8]. Missing data was mined by performing the interpolation and extrapolation methods. ARDL technique is applied to compute the parameters of the econometric model.

5. Results and Discussions

The results of our models are discussed below.

5.1. Unit Root Analysis

ADF unit root test is used to examine stationarity. The results are discussed in Arshad et al (2019).

5.2. Bounds Test Analysis

The bounds analysis is presented in Table 2 of our model.

Table 2: Bounds Test Result

Model	F-statistic	At 5 % level of Significance		At 10 % level of Significance	
		Io Bound	I1 Bound	Io Bound	I1 Bound
Model 1	3.373	2.21	3.26	1.98	2.97
Model 2	8.360	2.21	3.26	1.98	2.97

Table 2 revealed that the bounds test is valid for our models.

5.3. Long Run Results

Table 3 demonstrates the long run results of models.

Table 3: Long run Results of Income inequality Models

Variable	DV: (GINI)	DV: (MLD)
AFP	0.049637 (0.0626)	0.333621(0.0096)
HP	-0.167493(0.0011)	-0.142916(0.0194)
ERP	0.000918(0.9312)	0.172869(0.0297)
RP	0.006091(0.7796)	0.170636(0.0311)
CPAP	-0.011960(0.0912)	-0.036484(0.1178)
MSP	-0.049744(0.1116)	-0.168734(0.0406)
GRP	-0.129936(0.0173)	-0.064467(0.4323)
FBP	0.124386(0.0049)	0.361169(0.0081)
HFP	-0.101469(0.0779)	-0.412633(0.0136)
TP	-0.019244(0.4727)	-0.166477(0.0664)
C	----	----
T	-0.000666(0.0000)	-0.000761(0.0046)

5.4. Long Run Results of the Income Inequality Model

The CPI constituents has revealed both positive and negative correlation with GINI coefficient and MLD which are shown in Table 4. The variables such as AFP, ERP, RP, GRP, FBP and TP are positively associated with income inequality which means that by increasing their rate the income inequality is also increasing. The justification for this positive association is following.

[7] http://www.tradingeconomics.com/pakistan/gini-index-wb-data.html
[8] https://www.quandl.com/collections/demography/gini-index-by-country

When inflation rate sours the real income that how much people can buy from the existing amount of money reduces and income inequality increases. Greater the price level, greater is the income inequality, people will face and these findings are supported by Son and Kakwani (2006).

Secondly, in the third world countries government expenditures are politically budged and short sighted. Political parties give incentive to their supporters of free bees and less taxes. When they come into the power the supporters demand more free bees without paying taxes. The political parties tend to inflict more taxes that increases the price level in the jack up the income inequality. These results are supported by Desai et al. (2006).

The third motive is feeble negation position of workers' union that is responsible for galloping income inequality in an economy. The workers are already least paid and surviving on marginal wages, and when the price level increases, they are unable to adjust their wages upward; thus, the reduced real income is the result that further increases the income inequality (Jacoby, 2019).

This study has also found that some of the constituents of CPI such as HP, CPAP, MSP and HFP, are negatively linked with the Gini coefficient. The advocacy of such paradox results is following.

Firstly, the government reduce income inequality by transfer pricing, which means that for a large population, the government may provide subsidies on the essential goods and services that reduce income inequality despite huge inflationary pressure Chu and Cozzi (2018) and Achdut and Bigman (1991).

Secondly, trickledown effect also reverses the Impact of inflation on income inequality which means when inflation increases the income inequality decrease. It happens when economy maintains a decent rate of growth and increase in demand of factors of production not only increase the demand for new workers at escalated wages but also increases the wages of existing workers. In this way an increase in cost push inflation the income of the masses increases and income inequality reduces. Galloping inflation first increased the income inequality and decrease later Cheema and Rahman (2014). These results are also advocated by Khattak (2014). Thirdly, workers strong negotiation power plays a vital role in reducing the income inequality. Real income of the workers shrinkages as the inflation rate sours but if the workers have strong negotiation power they will adjust their wages upward thus increased monetary wages decrease the in an economy. The analysis is supported by Albanesi (2007).

5.5. Error Correction Analysis CPI Disaggregate Models with Income Inequality

The short run variations in our Models are explained by Error Correction Model (ECM) in Table 4. This analysis shows that in case any shock in the short run how much time it takes to recover.

Table 4 revealed that short run deviation from long run equilibrium due to unexpected shock will be settled in more than two years for both GINI and MLD.

Table 4: Error Correction Results of Model 1

Variables	DV: (GINI)	DV: (MLD)
D(GINIC(-1)	-0.201 (0.131)	---
D(GINIC(-2)	1.212(0.005)	---
D(GINIC(-3)	0.228(0.045)	---
D(MLD(-1)	---	1.170 (0.0004)
D(MLD(-2)	---	0.690 (0.0012)
D(MLD(-3)	---	1.041 (0.0006)
D(AFP)	0.199(0.005)	0.138 (0.0011)
D(HP)	-0.091(0.009)	0.111(0.0016)
ERP	0.001(0.881)	0.210(0.0017)
D(ERP)	0.162(0.008)	0.162(0.0008)
RP	-0.001(0.965)	0.161(0.009)
D(RP)	-0.410(0.005)	0.410(0.0004)
D(CPAP)	0.021621(0.001)	0.0271(0.0016)
D(MSP)	-0.077(0.001)	-0.207(0.0003)
D(GRP)	0.125(0.014)	0.117(0.0067)
D(FBP)	0.063(0.002)	0.291(0.0003)
D(HFP)	-0.234(0.003)	-0.763(0.0003)
D(TP)	0.068(0.007)	-0.101(0.0006)
C	----	0.667(0.0002)
T	-0.006(0.000)	-0.009(0.000)
CointEq (-1)	-2.800(0.002)	-2.071(0.0002)

6. Conclusions and Policy Implications

This paper has investigated the correlation among the constituents of the CPI and their Impact on income inequality in Pakistan. The Gini coefficient is used as dummy variable for the income inequality. The data are collected from Pakistan Economic Survey and Handbook of Statistics by SBP from the range of 1990 to 2023. The study has revealed both positive and negative linkage of constituents of the CPI on income inequality. An increase in price level reduces the amount of goods and services to the masses by slashing their real income that increase the income inequality (Memon and Qureshi, 2021). In presence of inflationary pressure if the workers have strong negotiation power for upward adjustment of wages, trickledown effect and better system of subsidies the income inequality may decreases. Here are some policy suggestions for economic managers of Pakistan.

- The economists may facilitate components of the CPI the AFP, ERP, RP, GRP, FBP and TP that are leading towards income inequality.

- The economic managers may also manage the constituents of CPI such as HP, MSP, CPAP and HFP which are dwindling income inequality.

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