RESEARCH ARTICLE

An Analysis of the World Convergence in Income Inequalities: a More Realistic Welfare-Based (Unbalanced Data)

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Abstract: An unequal world smashes the poor toughest. This paper investigates the broader concept of inequality, wrapping the convergence in incomes, income inequalities, and poverty for 189 world economies from 1980 to 2017 based on original unbalanced data as a whole and for income clusters. Being more focused on the middle and bottom class, the validity of the Neo-classical growth model, Kuznets inverted U-shaped inequality pattern, and world diverging into twin peaks is checked. The methodology consists of famous inequality indicators Gini, quintile shares of incomes, decile shares at top and bottom level in the form of graphical analysis for means and dispersion (standard deviations) of average shares of incomes for successive decades. This analysis supports that the world is converging in income inequalities with fast convergence for the top level. This confirms the neoclassical growth model, partially U-shaped pattern of inequalities by negating the twin peaks hypothesis as still, three income groups exist. As a major policy implication, the massive rise of food prices in recent years indicates that instead of following the race of being specialized in industrial products, it can make human life better by providing comforts and luxuries but unable to feed it. The deprived economies should concentrate on agricultural growth and productivity with the control of the population.

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1 Introduction

As a base of world crises, the extensive model of income inequality which addresses the whole population than a specific class (Fukuda-Parr, 2019) wraps both the income patterns and poverty disorders. Indeed, an unequal world traps people in fixed incomes and poverty by exposing the problem for the poor alone. Policies that are adopted to reduce poverty may not necessarily help in reducing income inequality (Norris et al., 2015). The truth is that rich are hit by it too, by turning such people, morally and spiritually, into monsters as wealth creates danger for their souls and kids. An empathetic society should not allow bizarre ethical deficiencies to run widespread among the rich. High inequality favors all types of anti-social behaviors, even if the rich are well behaved, the mere possession of wealth alongside overwhelming deprivation is wrong. It's increasingly clear that high levels of inequality damage human health and well-being, harm social cohesion, levels of trust, and act as a brake on economic performance by dramatically tilting the playing field for future generations (Anderson et al., 2018; Ferguson et al., 2018; Roos, 2015; Stuckler & Basu, 2013).

It's the fault of governments in injecting inequality crisis. These are trapped by wealthy individuals and taxing corporations underfunding dynamic public services such as education and healthcare. Such policies smash the poor toughest. During the last 40 years, a minute few are succeeding and governments helped them to do so. The top 1% hold more than half of the world's wealth and incomes more than the bottom 50% of all over the world population (WIID, 2018) with the surprising figure of 26 billionaires today hold more wealth than 3.9 billion people around the world. There is no greater policy challenge for the leaders in the world than that of minimizing increasing inequality and making growth wide-ranging (World Economic Forum, 2016). Developed economies face inequality challenges only while poor nations face both inequality and poverty. Convergence as the dominant narrative of world income inequality refers to the emergence of the income gap where convergence in incomes refers to the rise in income inequalities and vice versa by covering the scenarios of difference of incomes and poverty (Durlauf, 2003). Once larger the gap, the more difficult it is to make the jump, and such dynamics are fueled by being incapable to compete and specialize in industrial goods of high-income countries after shifting from the agricultural sector's slow income. In this paper, with the help of the data from World Income Inequality Indicators (2018), from 1980 to 2017 for 189 world countries, we attempted to provide a detailed analysis of patterns in income inequalities, shares of incomes held by different income groups with poverty analysis.

This analysis is of particular importance for several reasons. Firstly, though a significant number of studies explored this area, to our knowledge, no study has conducted a detailed analysis of convergence in inequality for each group of income in world and income cluster countries based on original data. Secondly, it is confirmed that the world is not converging into twin peaks of rich and poor as still, three groups exist. Thirdly, the validity of neoclassical growth model predictions about convergence in average incomes (Barro and Sala-i-Martin, 1995) that ultimately the world will achieve balancing incomes with no inequality and poverty, is found gradually working. Fourthly, inequality has proven to be an issue in both high and low-income countries. Moreover, understanding such analysis is the direct evidence of Kuznets hypothesis with inverted U-shaped inequality convergence (inequality rises in the early stages of economic development and declines at later stages) is seen waged. Furthermore, policy justification can be offered only after testing the current

scenarios of incomes, inequality, and poverty, being converging at high levels only where reforms have been adopted.

The rest of the study is organized as follows: Section two discusses the literature review of both empirical and theoretical studies with data analysis. Section three on estimation techniques. Section four contains empirical results and findings while the final section concludes the study with some policy recommendations.

2   Literature Review

2.1   Empirical Literature

Attracting growing research to analyse the issue of income inequality leads to the back of hundreds of years' industrial revolution. In this regard, at the world level, the studies of Kuznets (1955) projected the world income inequality as inverted U-shaped. This miracle was again supported by Alderson and Pandian (2018) while the studies of Acemogh and Robinson (2000), Doller et al (2016), Gasper (2012), Kane (2015), Milanovic (2003; 2016), Park (2001), Quah (1999), Schultz (1998), and Sala-i- Martin (2002, 2006) proved through different econometric techniques that increased incomes caused falling inequality and poverty. The attempts of Capéau & Decoster (2003), Fireburg (1999), Gallop (2012), Milanovic (2005), Milanovic and Yotzhaki (2001), and Ravallion (2003; 2014; 2018) supported the notion of an increase in world income inequalities while the effort of Hickel (2017) demonstrated that world income inequality was tripled now. The idea of twin peaks was first introduced by Dikhanov & Ward (2001) and afterward was maintained by the studies of Castellacci (2006).

The endeavour of Doller et al. (2015) concluded that inefficient macroeconomic policies for the bottom 20% and 40% of the world were responsible for income inequality. All these studies also decided that gaps in innovative capabilities and debt burdens of developing economies were among the main reasons for being in poverty. Chambers & Dhondge (2016) found convergence in developed economies only while Popov & Jomo (2018) witnessed the unequal convergence since the mid-twentieth century both in developed and developing economies. Darvas (2019) for 145 countries claimed that world income inequality has declined from 1988 to 2015 while without China and India it is higher now by mentioning that method of accuracy to measure world income inequality is still not accurate. Kant (2019) progressed that neither region of the world has achieved convergence since 1951 by negating the neo-classical "Iron law of convergence" that poorer countries are growing faster by proving poorer countries are diverging absolutely while richer countries are converging. Such literature depicts a mixture of results by making inequality a crucial political issue and a social debate among activists, analysts, and legislators around the world.

2.2   Theoretical Literature

In the 1990s, the interest shifts from convergence in incomes within economies to the study of its distribution, development, and identifying the factors to determine it (Aiyar et al., 2013). In both classical and neoclassical models of growth, the urge and ability for more savings among the rich class lead to an increase in inequality levels, which resulted in higher aggregate savings leading to higher levels of investment and growth more in closed

economies. In the political economy approach, higher redistributive pressure caused by high inequality, in turn, leads to economic disincentives and distortions. It prevents the rich to lobby to implement efficient redistribution policies (Myrdal, 1957; Bornschier, 1980; Darity, 1990; Blecker, 1996). Two major theoretical models, neoclassical growth models and structuralist north-south models suggest that income inequality convergence (divergence) is the consequence of inter-country flows.

Endogenous growth models state that economic growth is determined by endogenous forces rather than exogenous factors. Specifically, investment in human capital, innovation, knowledge as well as economies of scale and externalities are significant contributors towards equality (Botta, 2009; Datta & Mohtadi, 2006; Galbraith et al., 2006). Concerning increased inter-economy flows, these models focus on the positive externalities and spillover effects of technology that will lead to a more equal world (Benarroch & Gaisford, 1997). According to growth pole theory, inter-country flows are likely to cause economic growth around the pole(s). If there is only one pole, the theory implies overall convergence. If there are multiple poles, the theory then predicts club convergence (Perroux, 1970; Martin & Sunley, 2008; Oflaherty & O'Flaherty, 2009). More specifically, production is facilitated in the clubs of economic activity and is increasing to the returns of scale.

The Structuralist North-South growth model has been used widely to explain the interaction between a less developed "South" or "periphery" economy and a more developed "North" or "core" economy through international flows (Bornschier, 1980; Datta & Mohtadi, 2006). Asymmetry between North and South as the foundation and identification of the model, explains the differences in factor endowments as far more beyond the neoclassical focus (Myrdal & Sitohang, 1957: Dobson & Ramlogan, 2002). The Northern and Southern economies differ with regards to both macroeconomic structures and microeconomic characteristics (Prebisch & CEPAL, 2014). Typically, both countries produce food that is not traded. North exports manufactured goods while South exports primary products (Daniel, 1991; Botta, 2009).

Modern North-South theories typically retain the assumption that growth in the North is internally determined while growth in the South is externally generated (dependent on Northern growth). Some models here are concerned with the long-term effect of trade between North and South while others are with the long-run impact of capital flows (Bornschier, 1980). The specific implication of technology flows has not been a central concern of these models. The impact on inequality here is determined and investigated by outside issues such as race, gender, birthplace, and family background. Of course, individuals cannot influence the significance of these issues which differ from country to country.

3   Methods

3.1 Data and Definition of Variables The data applied in this study consist of Gini, shares of incomes held by deciles and percentiles from 1980 -2017 from WIID 2018 (world income inequality database, 2018) such as held by top 10%, top 20%, between top20% - 40%, middle 40% - 60%, bottom 20%-40%, bottom 20% and bottom 10% (for better understanding at top and bottom end levels). These areas are mentioned and recognized by World Bank where data is unbalanced with low availability for low-income economies. Although values are available from different sources it is tried to get the same source values for each country for each year to get the most reliable results.

The reason for 1980 is as, with time, different adjustments in the number of countries and geographic locations around the world have changed. Moreover, since 1980, data availability has increased for the number of emerging economies (Marrero & Rodríguez, 2013). From 1980 onwards, countries with very different degrees of development and growth converged to a larger level of inequality, registering an overall upsurge in market Gini's of five to ten percentage points.

Indicator Name	Description	Data Source	Period
Gini coefficient	Gini coefficient as reported by the source (in most cases based on microdata, in some older observations estimates, derive from grouped data)	Standardized World Income Inequality database	1980-2017
Shares of income (quantiles/ deciles)	Share of resource accruing to each quintile/ decile of the income distribution.	Standardized World Income Inequality database	1980-2017

3.1   Estimation Techniques

This paper has employed a more realistic approach to judging the convergence issue. It consists of the comparison of mean shares of incomes to the dispersion of mean values (standard deviation) for world economies and the income clusters to judge the convergence issue in incomes, inequalities, and poverty. It thus analyzes the incomes, inequality, and poverty levels for successive decades in graphic form for deciles and percentiles groups.

The Averages refer to the intermediate values for a set of discrete values. The equation for calculating it is

$$\bar{x} = \frac{1}{N} \sum_{(i=1)}^{N} x_i \tag{1}$$

And, the standard deviation which measures the spread of the data about the mean value is calculated as

$$\sigma = \sqrt{\frac{1}{N} \sum_{(I=1)}^{N} (x_i - \mu)^2} \tag{2}$$

Where a low value of dispersion means convergence to mean value and vice versa. It is widely used for testing hypotheses, based on all values even in the case of skewed data, and is considered as the best because of independent of origin and not of scale (Dasgupta

et al., 1973). Here Gini is taken as the Main inequality convergence/ divergence. Although other indicators could also be taken for it the data was most of all available. Gini as a most popular inequality measure satisfies the qualities of mean independence, population size independence, symmetry with Pigou-Dalton Transfer sensitivity (transfer of income from rich to poor reduces measured inequality), and Decomposability. Haughton & Khandker (2009) defined it as if x_i is a point on the X-axis (cumulative % of the population) and Y-axis (cumulative % of income) on a Lorenz curve). Then

$$Gini = 1 - \sum_{i=1}^{N}(x_i - x_{i-1})(y_i + y_{i-1}) \tag{3}$$

In the case of N equal intervals on the X-axis, this is as

$$Gini = 1 - \frac{1}{N}\sum_{i=1}^{N}(y_i + y_{i-1}) \tag{4}$$

Being a worldwide perception, this paper enters the connection realm among mean income, inequalities, and poverty convergence. As existing studies used econometric techniques to find out the convergence with low availability of data for third world countries, thus grabbed proxies for missing values to make data balance or excluded countries on such basis which might have caused measurement issues especially for poor countries. Moreover, studies either have explored the convergence in income inequalities for Gini only for a specific set of developed and developing economies or impact on Gini by top10 and top20; therefore, it is the first in-depth study constructed on original available economic unbalanced data.

4   Results and Discussion

The following figures are mean and dispersion (standard deviations) of average shares incomes for successive decades to indicate convergence/ divergence of incomes to mean incomes, inequalities, and poverty. To show how and when the situation is changed for each category for rich and poor class. All this thus creates the road map for the world and its income clusters.
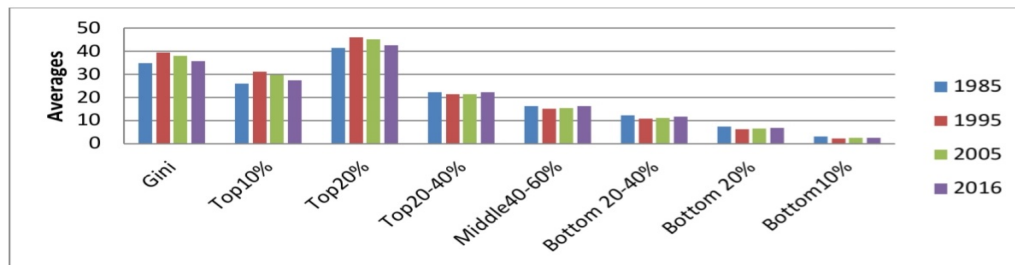

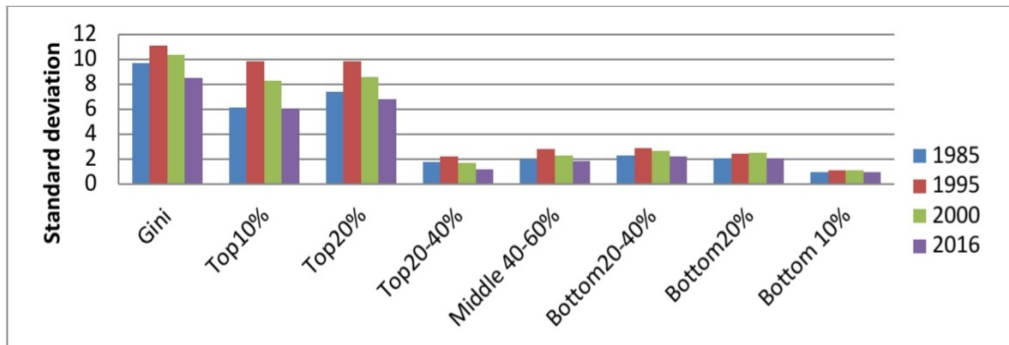**Figure 1: Convergence in Average Inequality Measures for World**

Figure 2: Convergence in Dispersion of Inequality Measures for World

Thus, the mean value of famous inequality indicator Gini was highest around 1995 and smoothened afterward gradually (as average shares for up to top 20% have decreased and converged (low dispersion) to the mean value. It means inequality is gradually decreasing at the world level. The average shares of the middle and bottom classes have increased slightly with a convergence pattern. This also indicates the improvement in middle-class incomes. However, the situation for the bottom 20% and especially for the bottom 10% is more or less stagnant after 1985 superior situation. It means the benefits of reducing incomes at high levels do not tickle down. The poor are still poor in all decades with the same level of deprivation. All this analysis specifies that convergence to mean incomes is speedier for both top and middle class and is quite slow for the middle while stagnant for bottom income groups.
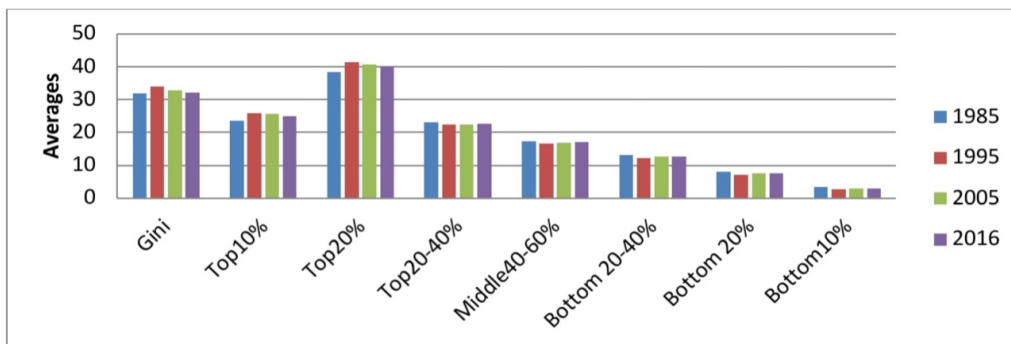

Figure 3: Convergence in Average Inequality Measures for High-Income Countries
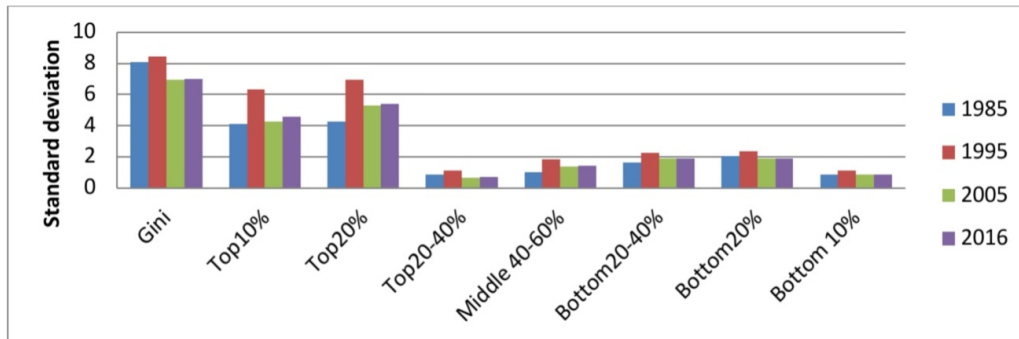
Figure 4: Convergence in Dispersion of Inequality Measures for High-Income Countries

In the case of high-income countries, the average value of the Gini index is gradually declining after 1995 with the convergence pattern, but this process has smoothened since 2005. It shows income inequalities are gradually falling here. Such drop is caused by the divergence in incomes for up to top 20 smoothened condition in last two decades. The average shares of incomes for the middle and bottom class have also increased with more or less same convergence pattern for top 20-40%, middle 40-60% with a bit of divergence from the mean value and bottom class with the same levels. It means such countries are gradually succeeding in attaining inverted U-shaped inequality patterns where it was projected that inequality would decrease due to the dynamics of education, the reduction of the return of capital, and demand for redistribution. These high-income countries contribute 75% of the total world GDP, by adding up to $85.8 trillion in 2018 according to the World Bank.
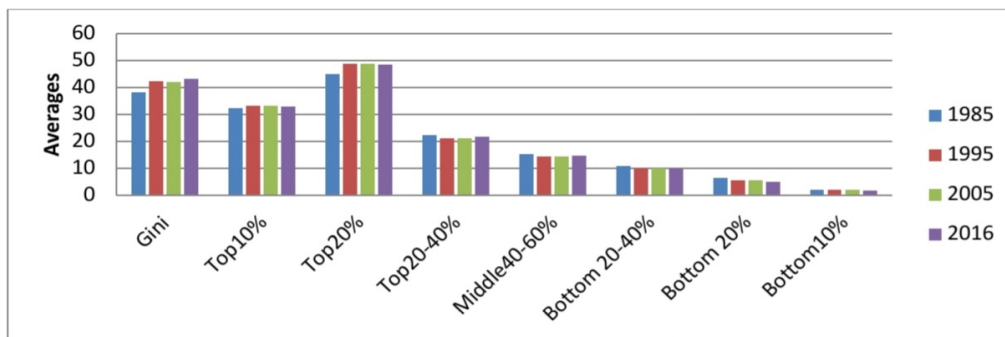

Figure 5: Convergence in Average Inequality Measures for Upper Middle-Income Countries
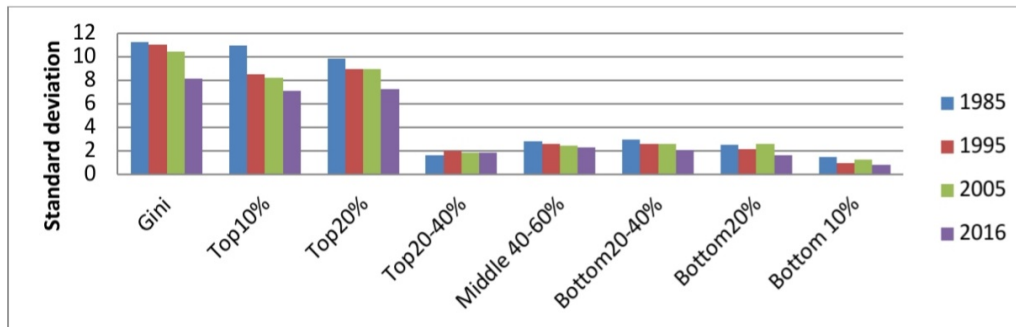
Figure 6: Convergence in Dispersion of Inequality Measures for Upper Middle-Income Countries

Here inequality levels are higher than that of high-income countries. The average value of the Gini coefficient was least during 1985, increased afterward but converged towards the mean value, thus supports convergence in income inequalities. It also shows that inequality is gradually increasing here. The inequality level is at its peak now where the reason lies in the increased and convergence pattern of average incomes for up to top20%. The situation for the middle and bottom class also shows the rise of incomes with a convergence pattern. It supports that rich are richer with improved incomes for the middle and bottom class. It seems such economies, in the race of economic growth and development, have forgotten the cruelty of inequality.
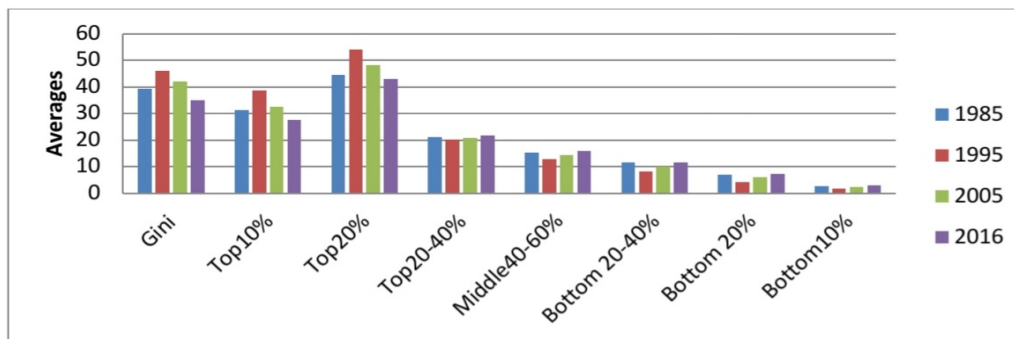

Figure 7: Convergence in Average Inequality Measures for Lower Middle-Income Countries
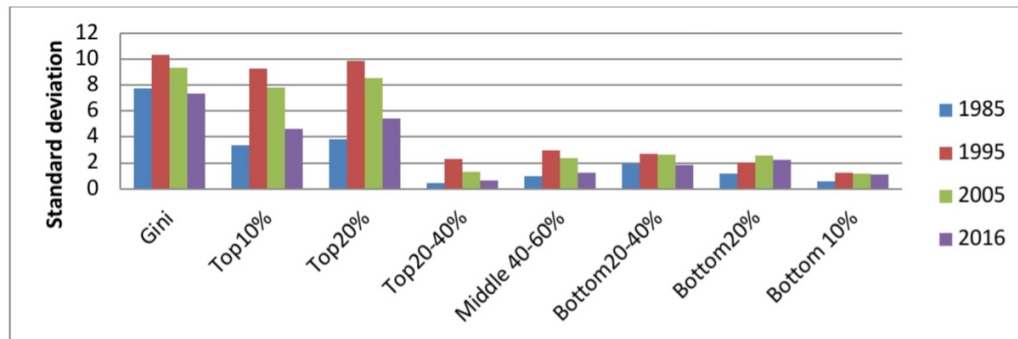
Figure 8: Convergence in Dispersion of Inequality Measures for Lower Middle-Income Countries

Although data availability is scarce for such countries but available indicates that the average value of Gini is improving and decreasing here gradually with convergence trend, thus supports convergence in income inequalities. The average shares of incomes held by up to top 20% have decreased after peak rise of 1995's and converged speedily by giving rise to income inequalities. Rich is still rich, which confirms inequality is a phenomenon of emerging economies too along with the problem of poverty. This whole analysis of improving average incomes for middle and lower classes with convergence patterns supports the overall convergence of incomes in respective groups/ the rise of inequalities. These economies are generally consumption-based so, to achieve growth targets, they use deficit financing and debt method that ultimately caused increase in inflation with less welfare (decreased purchasing power) on the whole. However, a big source of foreign remittances plays a vital role here.
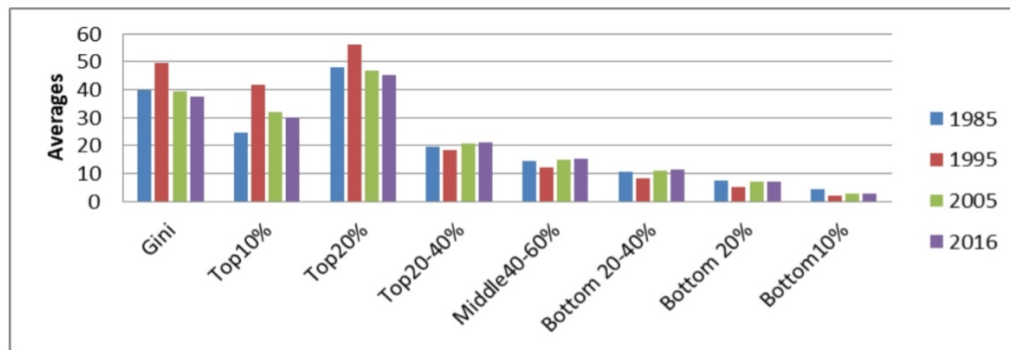

Figure 9: Convergence in Average Inequality Measures for Low-Income Countries
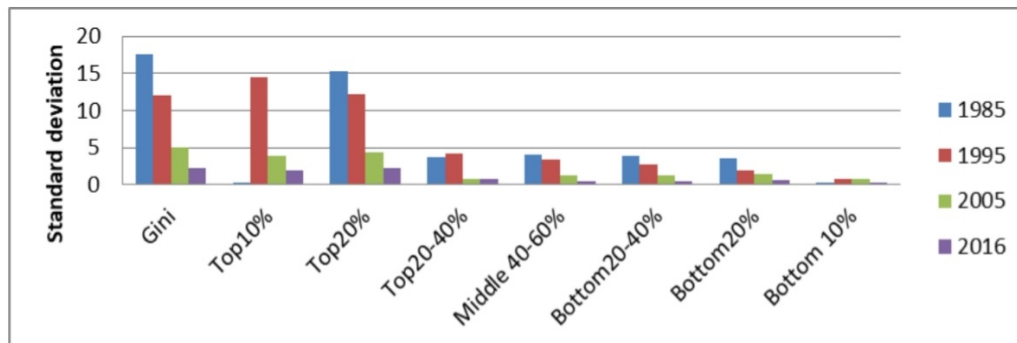
Figure 10: Convergence in Dispersion of Inequality Measures for Low-Income Countries

The literature is scarce regarding focusing on this cluster of low-income countries due to less or no availability of the data with missing values. That's why no statistical and econometric technique can provide true results, estimates, and scenarios of such economies. However, data availability for such economies is gradually increasing. Such economies which are characterized by consumption and agriculture-based economies are facing the dual problems of high inequalities and poverty. These also remained unable to shift towards the manufacturing sector. Here the mean value of the Gini index is gradually declining with the strong convergence trend to the mean value after the peak rise of 1995. It means here convergence in income inequalities is supported. The most influential here are the incomes of the top10% shares holders with the strong convergence pattern thus supports inequalities are mostly caused by this income group. The income shares of the middle class have increased and converged after 1995 but bottom class 10 % have got worse situation since then. Remittances of labor in such countries can be a major cause of such convergence for the middle class. These low-income countries with a combined population of about 705 million people add up to only 0.6% of world GDP (World Bank, 2018).

5   Conclusion and Policy Recommendations

It is found that countries across the world are converging in income inequalities, especially, in their respective income groups, where faster divergence for rich, making rich super-rich. Thus, convergence in income inequality is found partially supporting the notion of the Inverted U-shaped Kuznets hypothesis (1955) and confirms the validity of the neoclassical growth model. Moreover, the whole scenario confirms the presence of three income groups in the world economies. In these three groups, the bottom 40% does not deserve any tax cut, to lift its stagnant incomes. The top 20% deserve a substantial tax increase. The upper-middle-class taxes should remain roughly constant according to their share in GDP. To create economic prosperity for every human, bold actions need to be adopted for the racial wealth divide. Two arguments justify it, one religious and one secular. The religious justification is to be transparent about the aim of arrival in the world that is to serve humanity. The secular justification lies in that it's wrong to hoard excessive wealth in a world where people are dying for basic needs. Furthermore, taking money away from

the rich is a type of favor. They need to be occupied and quick, for the sake of their souls and kids due to the risk of violent conflict. Taxation of wealth (than taxation of income or consumption) should be given priority as a source of government revenues. Now it's time to change the broken and rigged economic system, to search for a new model that would benefit all humans and the planet. The last but not least, the massive rise of food prices in recent years is a warning for all that instead of following the race of being specialized in industrial products which can make human life better by providing comforts and luxuries but can't feed it.

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