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International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Impact of GDP, Inflation and Population Growth on Income Inequality in India

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ABSTRACT:

Income inequality has a negative impact on quality of life and as such there has been an intense on this subject both economically and politically. This study is an attempt to investigate the relationship between income inequality, Gross Domestic Product Growth Rate (GDPGR), inflation, and population growth rate. GINI coefficient is taken as a dependent variable and Growth rate of GDP is the main independent variable. Other independent variables are inflation rate (Consumer Price Index) and population growth rate. Inequality data as a form of GINI coefficients is taken from World Inequality Database by World Bank and other independent variables data have been extracted from World Development Indicator by World Bank. All the data is collected on annual basis consisting the period from 2001 to 2020. GDP growth rate and inflation have positive and significant relationship with the dependent variable, which is GINI coefficient here, while population growth rate has negative and significant relationship with GINI. All the coefficients are highly significant as probability value is less than 1 per cent. This suggests that the excessive population growth in India is one of the most crucial variables in leading to income inequality and deprivation

JEL: E1, E310, J110, D60

Keywords: GDP growth rate, inflation, population growth rate, inequality

1. Introduction:

There has been an intense debate on the subject of income disparity economically and politically with claims made about its overall impact on society. Income inequality leads to a negative impact on quality of life, some argue that increased inequality raises moral concerns since it reduces opportunities for underrepresented groups and minorities. Many others think that the biggest problem with this concern include morals when looking at it traditionally; along with economic deprivation too. If social mobility has decreased due to financial inequality, underprivileged groups have suffered. Consequently, economic growth becomes slower, and people with low incomes invest less in their human capital.

American citizens in the top 10 per cent bracket have an average income that is more than nine times higher than those at the bottom 90 per cent, claims UC Berkeley economist Emmanuel Saez. Due to the stark economic gaps that existed in the early 1900s, reforms were made by legislators, such as raising taxes on the wealthy and boosting unionisation for those at the bottom. However, these changes started to dissolve in the 1970s, which resulted in the current difference, which is even greater. Aside from its rapid growth, Asia has experienced the greatest success in the world in terms of its ability to reduce poverty. However, there is a significant increase in income inequality and the majority of people reside in nations with high levels of inequality. In spite of high economic growth, countries like India continue to be classified as "developing" nation. With a greater emphasis on the ideas of inclusive growth and shared prosperity, this scenario further stoked the debate on growth and equality. Although, the relationship between GDP and inequality has been the subject of extensive research for many years, there is still no conclusive answer to this question. One of the key justifications for why more disparity is advantageous is because it encourages people to put in more efforts. For instance, if those with higher education levels are more productive, income disparities will motivate more people to pursue greater education, improving overall output. The trend that people with higher incomes are more likely to save and invest than their counterparts is another reason why it results in more economic growth through investment.

There are very few scientific works in the field of economics that particularly explore the connection between macroeconomic issues and inequality. Moreover, earlier research has produced conflicting results as there is no agreement on macro issues and inequality are related. Specifically, the parabolic link between income and inequality was noted by Kuznets (1955). By outlining the well-known theory known as the Kuznets Curve, it is claimed by Fishlow (1995), Deininger and Squire (1997), and Bruno et al. (1996), that there is no discernible connection between inequality and income. Similarly, some studies have only looked at a small number of macroeconomic parameters, such as government debt, inflation, and currency rates (Bulir and Gulde 1995; You and Dutt 1996). Through the change in the real value of wages, salaries, rents, interest, dividends, and profits, inflation causes a redistribution of income and wealth. The debtor-creditor route is another important one. While high-income classes have more money to invest in diverse assets, low-income groups typically store their assets in cash that comes from their pay checks. As a financial phenomenon, inflation has a negative impact on the

poor since it reduces their purchasing power and leaves them dependent only on their own income. The poor get poorer because of inflation. Inflation thus encourages income inequality by widening the gap between various income groups. Social unrest may develop when income inequality becomes a more serious issue.

2. Data and Methodology:

The study uses GINI coefficient as dependent variable in order to examine the relationship between GDP and income inequality. The coefficient is an instrument that assesses the disparity in frequency distribution values and income inequality within a country. The coefficients range from 0 to 1, with 0 denoting a perfect equal distribution and 1 denoting a perfectly inequal distribution. The value cannot be greater than 1 as doing so would imply a loss of income. The GINI index contains the largest amount of data that is readily accessible online, which is the major reason using it to gauge income inequality. Growth rate of GDP is the main independent variable and other independent variables are inflation rate (Consumer Price Index), population growth rate. Inequality data as a form of GINI coefficients is taken from World Inequality Database by World Bank, and other independent variables data have been taken from World Development Indicator by World Bank. All data was collected on annual basis consisting the period from 2001 to 2020. Regression equation for the model can be represented as:

$$G_t = \xi_0 + \xi_1 W_t + \xi_2 I_t + \xi_3 P_t + \varepsilon_t, \quad (1)$$

Where, G_t denotes the GINI coefficient at time t; W_t denotes the GDP growth rate at time t; I_t denotes the inflation rate at time t; and P_t is population growth rate at time t and ε_t is the disturbance term.

3. Results

Table 1 Regression results

Dependent Variable: GINI				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GDPGR	0.001348	0.000376	3.582404	0.0025
INFL	0.002987	0.000458	6.519151	0.0000
POP_GROWTH	-0.161112	0.005334	-30.20730	0.0000
C	0.784528	0.007833	100.1571	0.0000
R-squared: 0.984798, Durbin-Watson stat: 1.823582				
F-statistic: 345.4895, Prob(F-statistic): 0.000000				

Source: Authors' own.

The data relating to all the cited variables is given in Appendix 1. Results of the regression are depicted in Table 1. GDP growth rate and inflation have positive and significant relationship with the dependent variable, which is GINI here. While population growth rate has negative and significant relationship with GINI. All the coefficients are highly significant as probability value is less than 1 per cent. R-squared value and D-W statistic is 0.9847 and 1.8235 respectively. F-statistic is also highly significate at 1 per cent level which, indicates the robustness of the model.

Diagnostic tests

To further check the reliability of the estimated model the study has employed few tests. Breusch–Godfrey Lagrange multiplier test for the residual serial correlation, Breusch–Pagan–Godfrey test and white test for heteroskedasticity in the model, Jarque–Berra test for normality and multicollinearity test to check whether independent variables in the model are independent from each other or linked to each other. The results suggest that the model is free from the serial correlation, heteroskedasticity, and non-normality issues as p-value is greater than 5 per cent which is for the rejection of null hypothesis having serial correlation, heteroskedasticity, and non-normality in the model.

Table 2 Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.902853	Prob. F(2,14)	0.1858
Obs*R-squared	4.274704	Prob. Chi-Square(2)	0.1180

Source: Authors' own.

Table 3 Breusch-Pagan-Godfrey Heteroskedasticity Test

F-statistic	3.213178	Prob. F(3,16)	0.0511
Obs*R-squared	7.519274	Prob. Chi-Square(3)	0.0571
Scaled explained SS	2.663849	Prob. Chi-Square(3)	0.4464

Source: Authors' own.

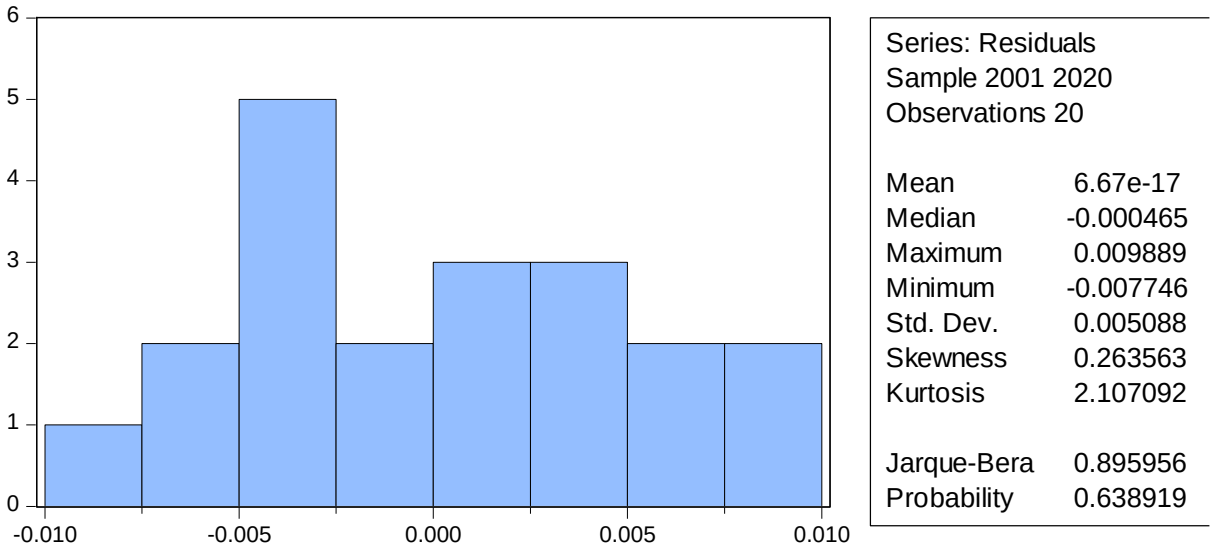
The study employed one more test named white test for heteroskedasticity because in Breusch-Pagan-Godfrey heteroskedasticity Test probability values are approximately 5 per cent (though greater than 5 per cent). To get a clear idea of heteroskedasticity problem the study conducted white test and results are robust as probability value is very high to reject the null hypothesis of heteroskedasticity.

Table 4 White Heteroskedasticity Test

F-statistic	2.213219	Prob. F(9,10)	0.1159
Obs*R-squared	13.31528	Prob. Chi-Square(9)	0.1489
Scaled explained SS	4.717197	Prob. Chi-Square(9)	0.8582

Source: Authors' own.

Table 5 Jarque-Bera Normality Test



Source: *Authors' own.*

Table 6 Multicollinearity Test

Variance Inflation Factors			
Variable	**Coefficient Variance**	**Uncentered VIF**	**Centered VIF**
GDPGR	1.42E-07	4.304036	1.079669
INFL	2.10E-07	6.490940	1.013272
POP_GROWTH	2.84E-05	34.08804	1.092984
C	6.14E-05	39.91463	NA

Source: Authors' own.

To test the multicollinearity in the model The study employed variance inflation factor test to work out the multicollinearity in the model. Table 6 represents that centered VIF values approximately 1 for all the independent variables GDPGR, INFL, POP_GROWTH which is less than 10. According to the rule VIF value is less than 10 indicates no severe multicollinearity exists in the model. Thus, this model is free from multicollinearity.

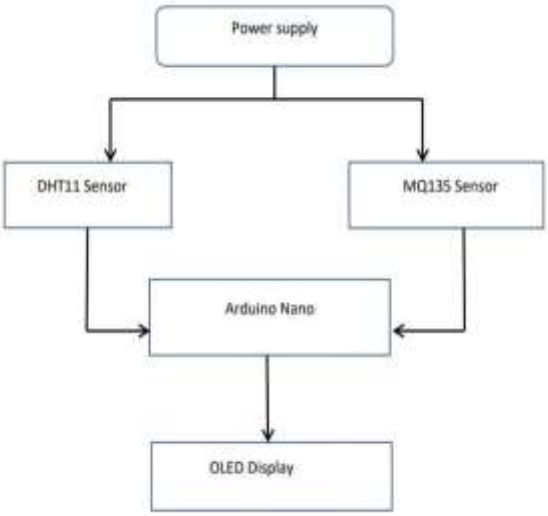


Fig 1 Block Diagram

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Table Factors influencing the rate for quality of service provided to the customers in the food truck

FEATURES	**5**	**4**	**3**	**2**	**1**	**TOTAL**	**RANK**
Service	62	55	29	8	0	633	1
Hospitality	41	70	34	8	1	604	3
Facility	41	58	47	8	0	594	4
Review	54	59	29	11	1	616	2

Conclusion

The study examines the effect of GDP growth rate, inflation and population growth on income inequality in India. It finds that there is positive relationship between GDP growth rate and income inequality indicating that share of India's increasing growth rate is centred among rich people rather than poor but, in this analysis the coefficient of GDPGR is 0.0013 means one per cent increase/decrease in GDPGR will cause only 001 per cent increase/decrease in income inequality. Inflation rate has also positive relationship with inequality which is in line with the previous studies. On the other side, population growth has negative relationship with income inequality. According to the result one per cent increase/decrease in the population growth rate will cause 16 per cent decrease/increase in income inequality. Increasing population growth rate reduce income inequality which could be the reason of more hands for job for the poor or increasing productive population which can enhance earnings of poor by job diversification. India needs to focus on redistribution of income as GDPGR is causing inequality although it is mild. Therefore, very high inflation needs to be controlled. Access to good opportunities for increasing population need to be the agenda to reduce income inequality as India have great advantage of youth population.

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Appendix 1.

Time	GINI	GDPGR	Infl	POP growth
2001	0.517804	4.823966	3.779293	1.728769
2002	0.527212	3.803975	4.297152	1.689562
2003	0.536751	7.860381	3.805859	1.651491
2004	0.546416	7.922937	3.767252	1.615308
2005	0.556198	7.923431	4.246344	1.579709
2006	0.565972	8.060733	5.796523	1.545696
2007	0.575956	7.660815	6.372881	1.509222

2008	0.586134	3.086698	8.349267	1.46489
2009	0.59649	7.861889	10.88235	1.410583
2010	0.607006	8.497585	11.98939	1.350338
2011	0.620348	5.241315	8.858361	1.288513
2012	0.626373	5.456389	9.312446	1.231485
2013	0.627859	6.386106	11.06367	1.182904
2014	0.633618	7.410228	6.6495	1.145673
2015	0.633618	7.996254	4.906973	1.116896
2016	0.633618	8.256306	4.948216	1.090459
2017	0.633618	6.795383	3.328173	1.063359
2018	0.633618	6.532989	3.945069	1.037828
2019	0.633618	4.041554	3.723276	1.013261
2020	0.633618	-7.25175	6.623437	0.989414

Source: *World Inequality Database for GINI and World Development Indicators for GDP growth rate, Inflation rate and Population growth rate.*