



## **The impact of macroeconomic policies on income inequality (Case Study: some developing and developed countries)**

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### **Abstract**

The present research addresses impact of monetary and fiscal policy on income distribution in some selected developing and developed countries. Income distribution in the economy is measured by various methods, most notably and most obvious of these methods include income distribution index using Gini index. Governments and states by imposing monetary and fiscal policies can have an impact on macroeconomic variables. Income distribution index is one of macroeconomic variables that are considered by economic policy makers. To estimate Gini index index in developed and developing countries, the panel data model was adopted. Liquidity as a monetary policy index and transfer fees as government's fiscal policy index is used. Statistical data between 2000 and 2014 using data from the World Bank were collected. The result of the estimation showed that the impact of monetary and fiscal policy on Gini index is negative in the two groups of countries.

### **Keywords:**

Income distribution - monetary policy - fiscal policy - per capita - panel data



## Introduction

Income distribution is found to be an important subject in economy and is crucial in most countries, especially developing countries with high economic growth. Governments to distribute income in desirable manner apply different tools such as the types of government expenses (operating, development and transfer costs) as well as taxes and implementing any fiscal policy can have different effects on income distribution. Unequal distribution of income and wealth in society causes many problems in economic, social, and political fields. Therefore, one of the government's economic tasks is suitable and fair distribution of income and wealth. Fiscal policy can certainly be effective in reducing inequality and redistribution. In other words, the government can redistribute income to regulate in a way that increases revenue and adjusted income of the rich-poor income gap between different groups of society. These policies can be established through taxation or transfer fees such as government subsidies (negative taxes), or increase grants and financial assistance to low-income people. Government intervention in the economy is one of controversial issues that were discussed during different periods and different views about it have been provided. Difference of views can be assessed in the form of various theories and different schools of macroeconomic and development strategies. This section seeks to address the underlying causes of each of the above theoretical and explain each one to explain the difference between them. However, the main difference between the views since the schools, especially in the field of macroeconomic analysis is mainly based on "market failure". The beginning of this section of the second chapter outlines the theories of market failures and then outlines the vision of each macroeconomic schools. (Hussaini, 2008). To measure the distribution of income, there are several indices that this section examines three common ones. (Hossein Zadeh, 2009).

- Lorenz curve: this curve was put forwarded by American statistician in 1905 Konrad Lorenz. Lvrnzdr means the geometric representation of actual income distribution curve is a relationship between the cumulative percentage of income holders (on the horizontal axis) and the cumulative percentage received by them (on the vertical enclosed), provided that the



terms of the income is sorted in ascending order. In this way anywhere in the Lorenz curve represents the sum of all income that is earned by the ratio of community people that has a certain amount of money or less of it.

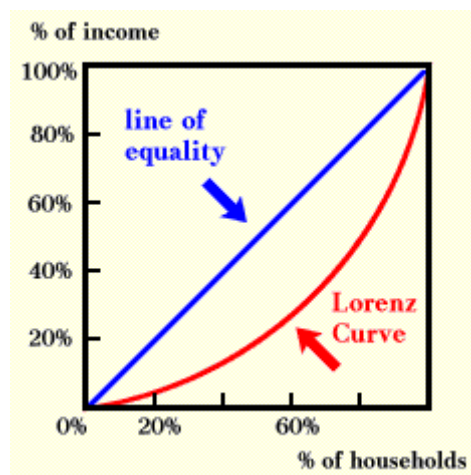


Figure 1: Lorenz curve

The more distant curvature of the curve of line 45 (total nationwide), the more inequality distribution.

- Gini index: this index is one of the most famous and most popular indices that measure inequality of income distribution based on the Lorenz curve resulting in a value. The Gini index is a measure of statistical dispersion is usually to measure the inequality in the distribution of income or wealth is used in a population. This coefficient is defined as the ratio has a value between zero and one. The Gini index is close to zero, greater equality in income distribution shows and vice versa and Gini index is close to a number, specifies the unequal distribution of income. If the Gini index equal to zero, i.e. all have the same income and wealth (absolute equality) and if a number is equal to the absolute inequality so that wealth is only in the hands of one person and the rest of no income. Or Gini index is a measurement of the income distribution of a country's residents. This number, which ranges between 0 and 1 and is based on residents' net income, helps define the gap between the rich and the poor, with 0 representing perfect equality and 1 representing perfect inequality. Gini index along Lorenz curve is a subject applied within the framework of welfare economics to calculate the degree of equality and justice in income distribution. This index varies between



zero where 0 is equality index and absolute equality and justice in income distribution and 1 a sign of inequality and injustice in this regard. Of course such two absolute values do not manifest in any country, but is rather close to zero, and in some others countries is intermediate. The Gini index can be easily compared across countries and it is also easy to interpret. GDP statistics are often criticized, they do not change the representation for the entire population. The Gini index showing how income changes between the rich and poor. If the good Gini index of GDP is rising, poverty cannot be improved for the majority of people. The Gini index can be used to show how the distribution of income can be used within the country over a period of time. As a result, it is possible to see if inequality is increasing or decreasing. In a plot, such index is divided by the area of the triangle area between the line and below the line Lorenz curve.

The Gini index is always between zero (perfect equality) and one (perfect inequality). If the index is between 0.2-0.35, the distribution is fairly balanced and if between 0.5-0.35 is relatively unequal distribution and if varies 0.5-0.7, the distribution is highly unequal. Typically, Gini index in Iran varies 0.35-0.55, which indicates that income distribution in Iran has always been unequal.

Quantile shares and indices based on it: for example the ratio of 10% income share of the richest to 10% of the poorest members of society shows that 10 top deciles are several times that 10 bottoms one.

### **Theoretical framework:**

Income distribution is one of concerns for community elites including historians, philosophers, sociologists and economists. The final years of the nineteenth century and early twentieth century are time for starting scientific studies to determine the number of poor people and communities into account in determining the poverty line along with other factors which play an important role in the emergence of the welfare state, the idea of social security and poverty alleviation policies. In the mid-twentieth century the need for poverty alleviation programs, according to the revelation of function theory of income distribution, income inequality, human capital theory of success as the interpretation of the theory of income distribution, availability of data, allowing faster data analysis and finally, intellectual debates



about distributive justice, contribute to the evolution of income distribution and the formation of the socio-economic index. The concept of income distribution is closely related to the concept of well-being. Welfare concept with emotion, perception and experience related. If we look at the issue from the standpoint of economic knowledge, sense of well-being and functional approaches to experimental conditions that can be analyzed in terms of the income distribution. It is clear that all income generated in the economy such as wages, interest and profits should be distributed somehow between economic units. It is desirable that the right to organize, income distribution in reducing inequality and increasing social welfare function. The definition of income distribution in the primary distribution of income and redistribution of income between two words to distinguish. The initial distribution of the income distribution is based on production factors, such as classical reasoning based on the concept of economic balance was the invisible hand, did not rest on their ideas rather than to redistribute income and believed that the initial distribution of income will lead to achieving economic equilibrium. In other words, the redistribution of income subject to the government, so it would be redundant to their opinion and with the help of the invisible hand of the initial distribution of income and economic equilibrium can be established. Income distribution is characterized with several states. One of the most important types of income distribution is the distribution of market income. Another type is the distribution of disposable income. One could disposable income distribution, as well as specific government transfer payments such as education and health care account. Broader than that person can analyze the distribution of disposable income along with all public services, including defense, justice and infrastructure services to consider. In a country where large scale public education and health care is provided free distribution of market income and disposable income can vary substantially. The effect of transfer payments and income disposable income and expenses between different markets in the short run, but over time they can also affect the distribution of market income (Chu, Davoodi and Gupta, 2008). In recent decades the role of government in economic activity has been rising and is highlighted. The state not only as a legal entity to run the country, but also as an economic entity whose activities have a determining role in the overall economic orientation, are known. The government task allocation, distribution and stabilization and the provision of public goods and services, a major share of GDP and national income is headed. The importance of government's role in



the distribution of income to the extent that almost all economists, one of the objectives and tasks of the government's income distribution. Moreover, in the modern macroeconomic theory, even in capitalist systems in the West who believe in full functioning market economy mechanisms, when dealing with issues that the invisible hand is not able to solve them, the important role of government in economic affairs have emphasized further . In this way the theory of redistribution of income as a way to mitigate and eliminate the gap is the initial distribution of income. National income inequality, including economic and social problems creates many problems. Fiscal policy can certainly reduce income inequality between rich and poor is a significant contribution. In other words, the government can regulate in a way that could regulate redistribution of income and the income of the rich and poor income reducing gap between different groups. (Ibid.)

#### Types of government spending and its impact on income distribution

##### General government expenditure

General government expenditure, including recurrent expenditure, capital expenditure (Civil) and transfer payments is. The total current cost of capital and the government called in the so-called government purchases.

##### Current government spending

Current government spending, in fact are those spending that build interests in long-term and has a direct interest in the future. Experts consider these types as consumption expenditures. These expenditures would cause an immediate increase in aggregate demand was unchanged on the supply side. It costs the government budget in the first part personnel costs have been determined and this is included in construction projects due to lack of organization, approved by the credibility of this order is not specified.

##### Salary

It costs against continuous service to the paid workers and often its recipients are government employees who are eligible for state employment, Informal and temporary and non-permanent staff in the country as allies and those covered by employment law in recent years as purchasing services, contract and daily wage, Employment law and related regulations



without mention of them been provided which include temporary staff agencies under specific legislation, workers labor and social security laws and other employees who do not meet any of the foregoing.

- The benefits and assistance

Every country has the advantages subjected to employment law, employment law and administrative units as well as special benefits for their jobs has been set and each its own advantages has some paradigm:

Emergency benefit or workers Jobs benefits

Reward

Superior overtime and on call

Bad weather emergency benefit, lack of utilities and place of work and employment abroad.

Other advantages and emergency benefits

In general, the government's current expenditure affect the distribution of income and improves status and performance before they enter the work force. (Rahbar, 2007)

State Capital expenditures (civil)

Capital expenditure or public investment, in fact include expenses that will earn in the future. In other words, it is necessary for the tasks and responsibilities of the state economy for investors incur various expenses in a way that will lead to direct and indirect income. These investments include machinery, buildings, research projects and various construction projects, etc. are often benefits can be achieved in the future. This type of investment also indirectly influence on income distribution, but in the future can have a positive impact on income distribution. (Ibid., 2007)

Government transfer payment

In fact is one-way transportation expenditure are expenditure that the government paid to vulnerable groups and entities specified in the law and in return for pay, goods or services not received. In other words, transfer of income or purchasing power from one unit to another



unit. It costs GNP, does not mean, however, are considered in the calculation of disposable income individuals. One of the immediate effects of this type of expenditure in the population, increased demand and consumption in society and considered as the task of distributing governments. A variety of government transfer payment are as follows:

Assistance and contribution of the public sector

Payments to a government agency to another government unit or a government to a public corporation or institution affiliated to the government, the public sector pays is in this context. The cost of providing its discretion highest authority of the chief executive and approved the final cost.

Assistance and contribution of the private sector: Payments by a device to individuals and legal entities in the private sector. The cost is the highest authority of the executive and ensure its discretion in accordance with regulations approved by the Financial Controller approved the final cost. Natural and legal persons shall have any relation to government employment aid devices.

Repayment of loans and payment of interest: internal and external loans of the banking system as other sources of financing in accordance with the law and the government's general budget and the use of current and development credits and is paid according to the law of principal and interest.

- Transfers payment to employees

In order to make transfer payments for social equilibrium, and without this payment against presentation of goods or services, unilateral paid according to the regulations. The payments to unemployed workers, pensioners, bonuses and other assistance to end services.

- Debts

Debt incurred by government's obligation by delivering the product or service or contract or vote for the competent judicial authorities have not provided the credit debt.

Debts is divided into two categories:

- Bad debt





Bad debt is debt that is not collectible and therefore worthless to the creditor. This occurs after all attempts are made to collect on the debt. Bad debt is usually a product of the debtor going into bankruptcy or where the additional cost of pursuing the debt is more than the amount the creditor could collect. This debt, once considered to be bad, will be written off by the company as an expense.

External debt: portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions. These loans, including interest, must usually be paid in the currency in which the loan was made. In order to earn the needed currency, the borrowing country may sell and export goods to the lender's country.

It is important to note that in most cases, the lower income groups, and their ability to directly make adjustments in the income distribution.

Various welfare programs and the transitional government in different countries, to compensate for low income people and lower income inequality fixes, including vouchers, pension, unemployment insurance, affordable housing and public housing, disability insurance, and non-cash donations cash (Jafari Samimi, 1992) The general government following five main goals: economic growth, price stability, full employment, balance of payments, the fair distribution of income. Among the stated objectives, the goal of equitable distribution of income is very important. Personal distribution or the amount of income, only with persons or households and total income they receive, we are facing and how to earn money does not matter. What is important, it is how much revenue is each unit, regardless of whether the income from employment, interest, dividends, rent, gift, inheritance or any other means earned. The income distribution of production factors or the share of total national income received by each of the factors of production are explained. Achieving fair distribution of income, requires the use of economic instruments is fiscal policy. One of the best indicators to measure income distribution is the Gini index . The Gini index of zero indicates perfect equality, namely individuals or households with income or expenses are completely identical. In contrast, the Gini index is a show full of inequality in the distribution of income or spending, meaning only one person or a class all income is allocated



to. This factor is independent of mean and symmetrical, meaning that if your income individuals mutually exchange, change in the Gini index cannot be reached. In this index, transferring income from the rich to the poor, and will reduce the amount of income distribution in society is sensitive groups (Jalali, 2008).

### **Literature review**

#### **- Studies in Iran**

Jprjzadeh and Ighbali (2005), in a study entitled "The impact of oil revenues on income distribution in Iran", using the Gini index and an econometric model, assessed distribution of income in the years 1995-2001 and shows that per capita production GDP, private sector investment, tax revenues and capital expenditures have positive effect on income distribution, while inflation, unemployment, government oil revenues and current expenditures impose the negative impact on income distribution and worsened the situation.

Naderan and Fooladi (2005), using a general equilibrium model studied effects of government spending on production, GDP, employment and household income.

Abounoori and Khoshkar (2006) using cross-sectional data in provinces of the country calculated distribution of income, the Gini index and income Quintiles. Based on the results, ratio of tax revenues to the provincial gross domestic product, inflation and government spending on inequality had additive impacts. Dervishi (2006), in examining "the impact of economic inequality of the income distribution in Iran using the Statistical Center of Iran," assessed Iran's income distribution using the Gini index as a measure of parametric, calculated over the period 1971-2004 and the average coefficient for urban areas 0.84 and for rural areas 0.54. Summing up, he suggests that the effect of inequality on the urban industrial sector in urban inequality and unequal effect on inequality agricultural sector in rural areas is higher than other sectors. Davoodi and Rostami (2007) in their study used econometric model link with a micro simulator to determine the effects of economic policies on income distribution deal in Iran. The researchers' findings show that implementation of monetary tightening policies to reduce inequality at the same time that the act could also slow economic growth while expansionary fiscal policies to reduce income inequality problem



about foreign policy as well as increased exchange rate floating exchange rate regime is increasing inequality.

#### - Abroad Studies

Volscho (2004) used quintile share of pre-tax income and transfer payments and the share of income after taxes and transfer payments twenties, to study income inequality in 14 OECD countries over the period 2000-1967. The results showed that there was no relationship between per capita income and the distribution of disposable income and per capita income inequality, but there was a U shape relationship between per capita and market inequality.

Easterly and Fischer (2006) examined the relationship between inflation and poverty using cross-sectional data across countries concluded that, inflation will worsen the situation of the poor and the spread of poverty.

Baylor (2007) applied following model to study the relationship between inflation on pay inequality. The results of his study showed that the level of development, employment, financial and price stability redistribution of income inequality has improved. Prices stabilizing effect on income distribution has been non-linearly. Reducing inflation from very high levels had a significant effect in reducing income inequality, whereas inflation at very low levels, reducing inflation had a negligible effect on the reduction of the Gini index. Gullies and Hayon. (2007), explained effect of monetary policy on inflation and economic inequality in developing countries in empirical and theoretical perspectives. Theoretically found that restrictive monetary policies in countries with high inflation have been effective in reducing inequality. On the other hand, reducing inflation in economies with low inflation, income inequality is increasing. Model  $g_t = \beta_0 + \beta_1 \pi_t + \beta_2 \pi_t^2 + \beta_3 y_t + u_t$  was used test this hypothesis, where  $g$  represents Gini index, or proportion of each of quintile income.  $\pi$  Long-term inflation rate (CPI) and  $y$  is long-term GDP real growth. Also  $u$  is an error terms. This empirical study confirms time series data of 1966 and 1999, the United States and fifteen OECD. Wells (2010) applied cross-sectional data in a research titled as effect of education on income inequality. The results of his study showed that the correlation between the level of development and inequality is nonlinear and in accordance with the Kuznets hypothesis. High school enrollment was negative relationship between growth and income inequality. The



effect of economic freedom on the positive inequality (only was significant in model year 2005). Low economic freedom reduces inequality but moderate open economy lowers inequality among others.

### Model Estimation:

To influence monetary and fiscal policy on income distribution in developing and developed countries of the study, income distribution model are provided as follows. This model is based on paper written by Mello and Tiongson (2003).<sup>1</sup>

$$GIN = f(GDP, POP, GOV, M)$$

$$GIN_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 POP_{i,t} + \beta_3 GOV_{i,t} + \beta_4 M_{i,t} + v_{i,t}$$

The variables in this model are:

GINI (Coefficient): index of income inequality (Gini index) GDP (Per Capita): GDP per capita

POP (Over 65 years of age): the total population over 65 years

GOV (Government Spending): Government transfer fees (index fiscal policy)

M (Money) money supply (monetary policy index)

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<sup>1</sup> Mello and Tiongson « **Income Inequality and Redistributive Government Spending** ] Prepared by Luiz de Mello and Erwin R. Tiongson Authorized for distribution by Sanjeev Gupta January 2003 Luiz de Mello and Erwin R. Tiongson



i:area (country)

t: time

To estimate model, panel data econometrics will be used.

In this paper, the effect of monetary and fiscal policy on income distribution in both developed and developing countries Static panel, is used. Panel data methods to detect and measure the effects that easily cross-sectional studies and specific time series are not predictable, high functionality As well as more flexibility, co-linearity less, the degree of freedom and higher performance, the characteristics of the data panel. For this purpose, after examining the reliability of variables in the first stage, using co-integration tests to investigate the long-term relationship between the variables we will study and then by a static panel model, the effects of the variables used in the study of income distribution index is regressed. To do this research, sample five developed countries, Norway, Australia, America, the Netherlands and Germany and the five developing countries of Iran, Turkey, Saudi Arabia, Malaysia and China for the period 2014-2001 has been used. Based on the most recent in a series of reports based United Nations Industrial Development (UNIDO) Country Norway as the most developed country in the world introduced in 2013 and four in Australia, America, the Netherlands and Germany accounted for ranks 2 to 5 respectively. Pre-Integration testing to determine long-term relationship between the original study unit root test shall be done to prevent the problem of spurious regression for variables. Unit root econometrics literature and indicate that the unit root test based on panel data time series with the power of the unit root test is more accurate. In this paper, Levin, Lin Chu unit root test is used to evaluate the reliability of variables.

**Table 1: unit root test for variables**

Variables	Developing countries	reliability	Developed countries	validity
	LIVIN LIN CHOW		LIVIN LIN CHOW	
	calculated statistics and ((probability		calculated statistics and ((probability	
GINI	-1.34 (0.08)	I(0)	-2.25 (0.01)	I(0)
GDP	-2.98 (0.00)	I(0)	-2.28 (0.00)	I(0)
POP	-3.04 (0.00)	I(1)	-4.36 (0.00)	I(0)
GOV	-2.08 (0.01)	I(0)	-1.67 (0.04)	I(0)
M	-3.87 (0.00)	I(1)	-5.83 (0.00)	I(1)

Reference: author research

The results in Table 1 and determine the values of calculated and the probability of adopting them for two groups of countries shows some variables are reliable and some single-level differencing were reliable.

Co-integration test in panel 1:

In the case of co-integration relationship between two variables, it is possible to estimate the efficiency of the pattern found in this case, despite the unsteady time series, the problem of spurious regression equation was estimated not have, long-term equilibrium were. In this study, the test group of Dickey Fuller t Panel ADF Statistic show that will be used. The results are presented in Tables 2 and 3.

**Table 2: co-integration test panel for developing countries**

Method	Statistic	Prob.**
ADF - Fisher Chi-square	19.4974	0.0344
ADF - Choi Z-stat	-0.63849	0.2616
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.		

Reference: author research

**Table 2: Results of co-integration test panel for developed countries**

Method	Statistic	Prob.**
ADF - Fisher Chi-square	22.3085	0.0136
ADF - Choi Z-stat	-2.59660	0.0047
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.		

Reference: author research

It is observed that the results of Tables 2 and 3 for the two groups of countries and Due to the low significance level of 0.05, null hypothesis that the lack of co-integration relationship between variables is rejected.

There testify convergence variables and variables stacked in the long run and long-run relationship between them. Model estimation and interpretation of the results: After the unit root test, it is necessary that the relevant diagnostic tests done to determine the estimated model. In order to ensure significant sample group of Member States, the significance of the groups are used. For this purpose, the F statistic is used. If the calculated F-statistic is greater than the F table hypothesis  $H_0$  to the width of origin will be deleted and must be considered in estimating the width of several. As a result, the method can be used to estimate panels. Hausman test, the hypothesis  $H_0$  based on the hypothesis  $H_1$  compatibility random effect estimates based on incompatibility estimates of the causal effect is tested. If the hypothesis  $H_0$  is rejected, should be used to estimate the fixed effects model estimates. Otherwise estimation is done using random effects. In the table below the results of diagnostic tests and Hausman F Limer to select the appropriate model is given.

**Table 4: Results of model selection to model estimation for developing and developed countries.**

Prob	Statistic value	Test statistic	Test type
0.00	25.36	F	F bound for the developing countries
0.00	46.43	F	F bound for the developed countries
1.00	0.00	H	Hausman test for the developing countries
0.00	369.94	H	Hausman test for the developed countries

Reference: author research

Based on F test, with 95% probability hypothesis that the identity of individual effects studied for two groups of countries cannot be accepted. Therefore, the results of ordinary least squares method, bias and Have adopted an approach to individual effects of heterogeneity variables must be considered. So we can say that fixed and random effects methods that have high explanatory power and individual effects to consider, the results offer more reliable and more efficient than other methods are more appropriate. But to choose the right model between fixed and random effects models, need to be done Hausman test. Hausman test in the group of developed countries fixed effects and random-effects model for developing countries shows will be accepted. After determining the type of estimates method, the model estimation will be discussed.



**Table 5: results of model estimation**

Developing countries model			Developed countries model			variable
prob	Test statistic	Impact factor	prob	Test statistic	Impact factor	
0.00	10.74	53.02	0.00	4.66	35.52	constant
0.00	-3.18	-0.00033	0.35	-0.93	-0.000117	GDP
0.73	0.33	0.18	0.01	2.62	0.62	POP
0.27	-1.10	-0.25	0.00	-2.90	-0.39	GOV
0.00	-3.26	-1.01	0.01	-2.44	-1.31	M
R2=0.57 prob(F - Statistic)= 0/0000 F = 20.99			R2=0.92 prob(F - Statistic)= 0/0000 F = 81.44			

Reference: author research

The results of model estimation in developing and developed countries, suggest that the population over 65 years indicator variable coefficient Gini index is positive and significant, the effect of the transitional government spending in developing countries and developed the Gini index is negative. The effect of money supply as monetary policy indicators as well as the Gini index is negative. In accordance with the expected impact on the index Gini index of per capita income in these countries is negative. Income inequality in developing countries is on average lower than in industrialized countries. While industrialized countries improve income distribution through taxes transitional while developing countries compared to industrialized countries to achieve equality of income redistribution programs tailored to the transfer tax are not studies show that the redistribution of income in developing countries and is limited to small stuff is not systematic and subsidies, mainly in developing countries. It includes transfer payments in these countries are rich and therefore not likely to improve the distribution of income. The poor in developing countries rarely pay taxes and education and health spending accounts and other transfer payments account for a large share of the budget. On the other hand, generally paying the social costs of government subsidies to pensioners, the unemployed, educational expenses and so their health is not exhaustible and component costs.



### Impact of per capita income effect on Gini index

Increase in per capita GDP increases per capita income resulting in higher savings, and investment have continued to occur employment potential in reducing inequality of income distribution affects this process.

### The impact of population on the Gini index

The impact of population on the Gini index is positive and this means that with increasing population, the Gini index increased in countries (More income inequality) in the study population of people over 65 years has been used for variable because this group of the population and are often consumer<sup>۲</sup> not able to generate an increase in per capita income of the population declined and it is also expected that the Gini index increases.

### **Future Perspective:**

According to the results of model estimation in developing countries and developed it can be noted that effect of government spending on the Gini index in developed countries is higher than developing countries and suggests that governments in developed nations are better able to intervene in the economy to improve income distribution and reduce the decile class, hence it is recommended in developing countries modelling different ways of spending government spending as well as policy targeting will increasing the effectiveness of their policies.

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