

# INCOME DISTRIBUTION AND ECONOMIC GROWTH: A CROSS COUNTRY STUDY

Abdullah KESKİN\*

## Abstract

This study aims to analyze the relationship between income distribution and economic growth. It also investigates any certain level of income distribution which provides maximum economic growth. The Gini coefficients and GDP growth rates of 105 countries are used to test the relationship. A linear and a nonlinear regression models are used on cross-country data. Both regression results indicates a significant relation between two variables. The Gini coefficient for optimal income distribution which maximize economic growth is 43,6.

**Key Words:** Income Distribution, Gini Coefficient, Economic Growth, Economic Systems

## 1. Introduction

Income distribution is one of several factors leading inefficiencies in the market economies<sup>1</sup>. There are several factors which cause income inequality, such as market economy itself, inflation, lack of competition in the less developed countries – monopolies and oligopolies-inappropriate economic policies, structure of the markets, etc. In fact, market economy creates income inequality as a result of its fierce competition. Furthermore, it does not have any systematic tool in its structure to cure the inequality. Income distribution is an important factor for economic growth. Therefore governments should intervene the market to smooth income distribution.

The market economy makes use of the resources of a country to provide the luxury needs of small rich group of the country instead of providing basic needs of large poor group. This

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\* Asistant Professor, Afyon Kocatepe University, Faculty of Economics and Administrative Sciences, Department of Economics, akeskin@aku.edu.tr.

<sup>1</sup> The most known other inefficiency situations inmarket economies are imperfect competition, externalities, pure public goods, asymmetric information and business cycles.

unpleasant structure becomes much clearer if the distortion in income distribution gets larger. To regulate income inequality, it needs to be intervened by the government for redistribution of income. But this intervention leads many other problems. Such as in what level and how much intervention is required, and also how income would be redistributed are very difficult questions to be answered.

Increase in income inequality may also creates some social problems such as moral hazard, cultural degeneration, more crimes and new crimes besides economic ones in a country. Increase in the number of these kinds of social problems may give a clue in other way about the degree of inequality.

It is argued that while income inequality increases, economic growth decreases as a result of disappearance of peace and increase of social problems. On the other hand, it is again argued that income equality also negatively affects the economic growth since lack of motivation becomes a barrier to the economic growth. So, what would be the optimal level of income distribution which induces economic growth?

This study attempts to evaluate income inequality and economic growth using data from 105 countries and shed light on the complex relationship between these two variables. First, the difference of income distribution between 23 developed and 82 developing country groups is investigated. If they differ from each other some way, then, one may ask these questions: Is income distribution one of the determinants of the economic growth? If such a relationship exists, can we look for a certain level of income distribution for a country to reach possible maximum economic growth rate?

Second, the relationship between income distribution and economic growth for the countries is investigated. Since higher income inequality is a reality for developing countries, could particular economic policies to reduce inequality be employed in these countries to deal with income inequality and encourage economic growth?

The rest of the study is organized as following: The second section reviews the literature, the third section gives information about data sources and methodology, the fourth sections includes empirical work, and the last section ends with a conclusion.

## **2. Literature Review**

Income distribution and its impact on the economy has been studied particularly since the 1950's. It began with Kuznets' (1955) study on an inverted U relationship between per capita

GNP and income inequality. Kuznets suggested that as per capita income rise in the early stage of development, income inequality also rise, then reaches a maximum, and at last declines as income levels rise further in the later stage of development periods. Kuznets developed his hypothesis, later named as inverted U hypothesis, studying data estimating income distribution in a few rich and a few poor countries and studying trends in distribution in few European countries over time (Perkins at all, 2001: 129). Following this path breaking hypothesis, many developing countries tolerated rising income inequality believing that income would become more equally distributed with advanced development as Kuznets observed. Unfortunately, some later studies reveal conflicting results between income inequality and economic growth. Some of the studies find a negative relationship between income inequality and economic growth [Persson and Tabellini (1990), Alesina and Rodrik (1994), Clarke (1995), Perotti (1996), Benabou (1996), Gottschalk and Smeeding (1997), Aghion at all. (1999)] while other studies find a positive relationship between them [Adelman and Robinson (1989), Li at all (1998), Forbes (2000)]. Therefore, there are still many remaining questions must be answered about the relationship between income inequality and economic growth. In other words, the relationship between income inequality and economic growth is far from well understood yet.<sup>2</sup>

There are three approaches which explains the relationship between income distribution and economic growth. These are classical approach, modern approach and the unified model (See Appendix). According to classical approach, It has been argued that income inequality and the accumulation of wealth in a small proportion of individuals would result in higher growth in the future. There may be three reasons for positive relationship (Dadkhah, ?): First, the rich consume proportionately less of their income and a higher propensity to save stimulate a faster growth rate. Second, indivisibility of investment project make the concentration of resources in a few hands a prerequisite for investment and growth. Finally, workers and employers require incentive to exert their utmost efforts. A society committed to equality would not provide the incentive system necessary for growth. However, there could be a negative impact of income inequality on growth as argued others (the modern approaches and the unified model). There may be three reason for negative relationship (Dadkhah, ?): First, inequality reduces investment opportunities. Second, inequality worsens borrowers' incentives. Finally, inequality generates macroeconomic volatility. If a country experiences high income inequality, there is great pressure from the poor to redistribute the wealth

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<sup>2</sup> Three channels through which how income inequality affects economic growth are given in the Appendix.

accumulation. The high taxes levied to redistribute the wealth lower the rate of return on private assets, which restricts capital accumulation and slows growth (Clarke, 1995).

A prominent case study (Benabou, 1996) displaying contrary relationship between income inequality and economic growth is that of South Korea and Philippines. These two countries looked quite similar in the early 1960's with regard to major macroeconomic variables such as GDP per capita, investment per capita, average saving rate, population, urbanizations, primary and secondary school enrolment. However, these countries differed in their income distribution. In 1965 South Korea's Gini coefficient was 34,3 while the Philippines' Gini coefficient was 51,3. They became 33,6 and 45,7 respectively in 1988. During the next thirty years, fast growth in South Korea resulted in a five-fold increase of the output level even though it has pretty income distribution, while the Philippines' output level barely doubled with its inequality in income distribution (Aghion et al., 1999).

Other study by Krongkaew and Zin (2006) attempts to find the relationship between rapid economic growth and income inequality in eight East Asian countries. These countries are China, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand and Vietnam. The study states that "income distribution associated with the different patterns of growth differs from one country to another, making the relationship between economic growth and income inequality non-uniform. Some may achieve the Kuznets type growth, that is, income inequality increases as the country grows, but some may have the opposite effects".

Barro (2000) presents empirical evidence that indicates higher inequality reduces growth in poor countries and increase growth in richer countries. He also presents theoretical analysis of the macroeconomic mechanisms, including credit market imperfections, political economy, socio-political unrest, saving rates, in which income inequality relates to economic growth. Barro explains situations that could have either positive or negative effects on growth. The uncertain effect of all the interrelated factors can be seen through the empirical study.

According to Alfred Marshall, one of the main targets of the economic activities is to maximize the common welfare of the country. Policies for reducing income inequality have to be developed to reach this goal. Certain level of income provides much more satisfaction for the poor rather than the rich. Therefore, social welfare increases as income inequality decreases (Ersoy, 2008: 511 cited from Screpanti ve Zamahni, 1993: 182).

Pigou (1952: 118-122), using GNP as an indicator for welfare, tries to show that the only way to increase the social welfare is to reduce income inequality. The utility of the marginal income for the poor is higher. Therefore, the social welfare increases depending on policies

which reduce income inequality (Oser, 1963: 319). As a result, state intervention for redistribution of income is necessary for social welfare (Ersoy, 2008: 524-525).

Income inequality prevents a large portion of the population from improving their knowledge and skill through education which slows the social development (Wells, 1988: 28). Social development and social institutions are very important for social capital accumulation as a production factor.

### **3. Data Sources and Methodology**

Data used in this study is taken from World Development Report 2000-2001 for 23 developed and 82 developing countries. World Bank separates countries in three sub-groups depending on their per capita GNP. These sub-groups are as:

- ✓ High Income Countries (\$ 9266 or over)
- ✓ Middle Income Countries (from \$ 755 to \$ 9265)
- ✓ Low Income Countries (\$ 755 or lower)

Since it is convenient, meaningful and generally accepted, the countries in high income group are taken as developed countries while those in low income and middle income groups are taken as developing countries (WDR, 1998-1999: 251).

There are various methods to measure income distributions. One of those measures, the most used one, is Lorenz Curve and Gini coefficient. Lorenz Curve can be obtained by adding each 20% of the national income on the vertical axis and each 20% of the population on the horizontal axis cumulatively. Gini Coefficient is the ratio of the area between the Equality Line and Lorenz Curve to the area of triangle under the Equality Line. We can compare the average Gini coefficients of developed and developing country groups to see if there is any difference between their Lorenz Curves.

Two regression models, linear and nonlinear, are run to search the relationship between income distribution and economic growth. In the nonlinear case, a new model developed and applied on empirical data and then compared with Kuznets' model.

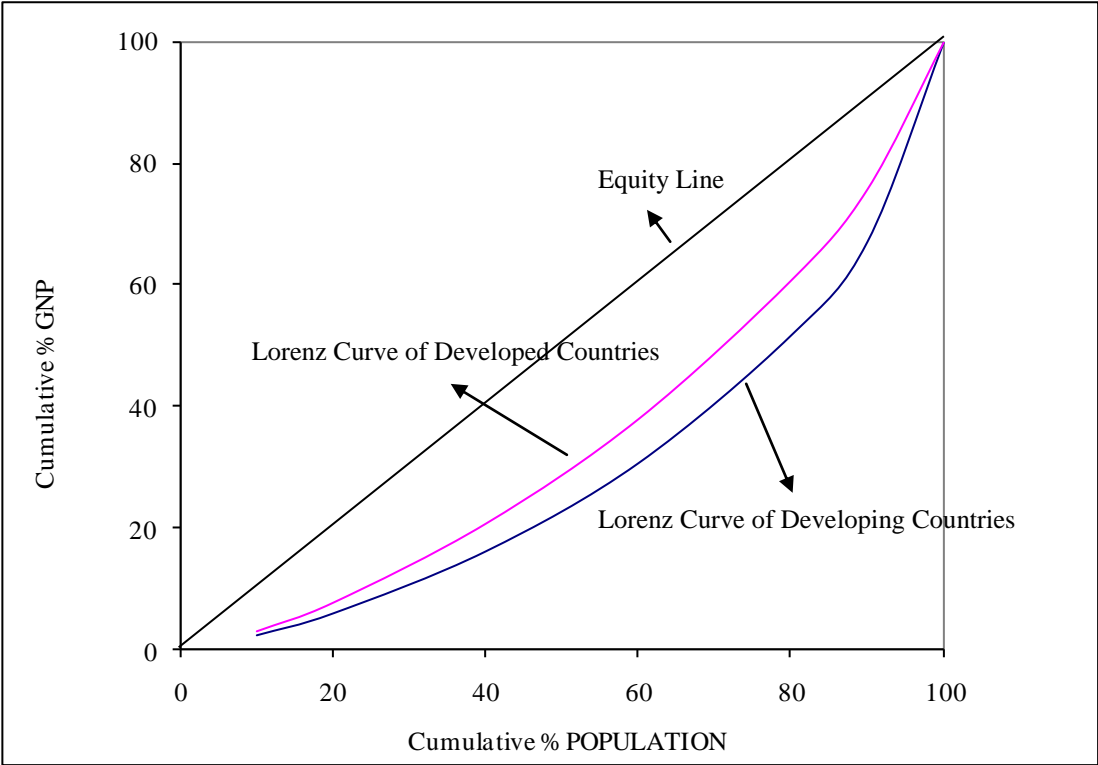
### **4. Empirical Study**

The Lorenz curves of the developed and developing country groups are plotted at the Figure 1. The curve close to the equality line belongs to the developed countries while the other one belongs to the developing countries. Since it is clearly seen they differ from each other, then,

we can think about the correlation between per capita GNP and income distribution. Additionally, we can think the relationship between income distribution and economic growth. It means lower Gini coefficients (more equity in income distribution) creates higher per capita income (or economic growth). In other words, optimal income distribution increases per capita income and reduces inequality. There may be two way casual relations between income distribution and economic growth.

As mentioned earlier, Kuznets explains the positive and negative relationship between income inequality and economic growth depending on the stages of development. Countries, in the early stage of development periods, have both rising per capita income and income inequality. But, at the later stage of development, countries have low income inequality with high per capita income (Kuznets, 1955).

Figure 1: Lorenz Curves of Developed and Developing Countries



As it is seen in the Table 1, there are percentage shares of income for the poorest and the richest 20% of the selected high inequality and low inequality countries. In the high inequality countries (Guatemala, Paraguay, Brazil, Swaziland and New Zealand), the percentage share of the poorest 20% of the population changes between 2.1 and 2.7, while the same percentage share in the low inequality countries (Slovak Republic, Japan, Austria, Czech Republic and Finland) changes between 10.0 and 11.9. The percentage share of the richest 20% of the

population for the high inequality countries changes between 46.9 and 64.4, while the same percentage share for the low inequality countries changes between 31.4 and 35.7.

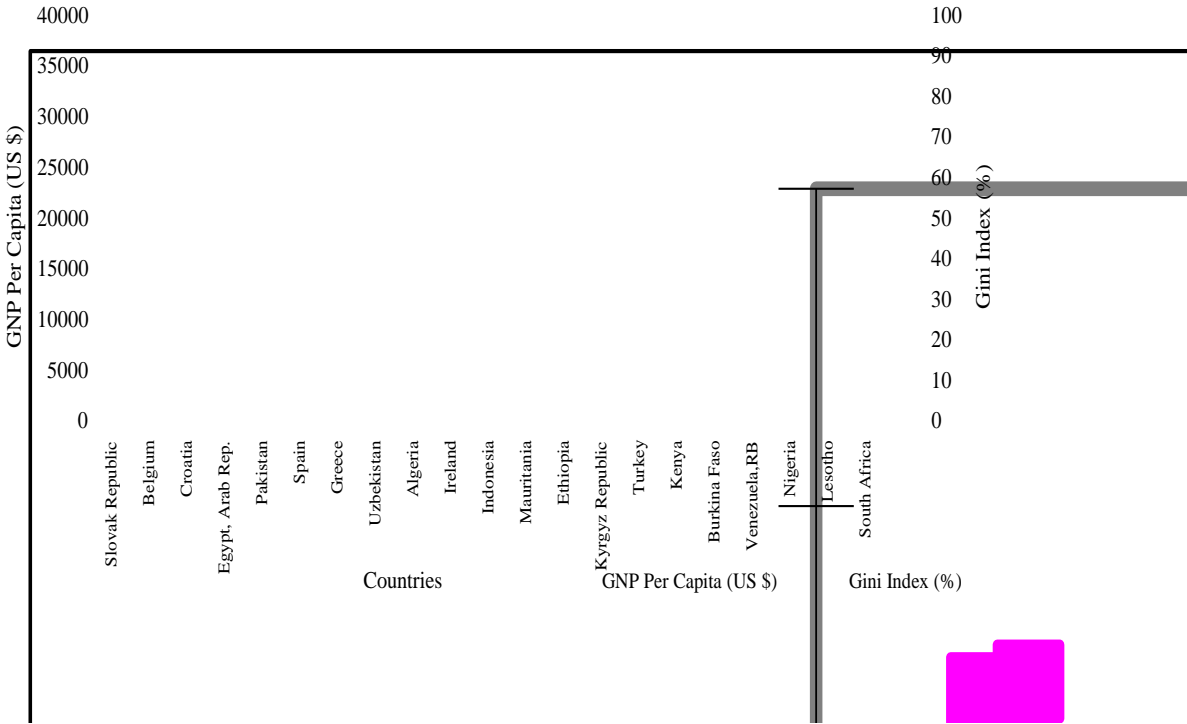
**Table 1. Percentage share of income (poorest and richest 20 percent of the population)**

<i>High Inequality Countries</i>	<i>Lowest 20%</i>	<i>Highest 20%</i>	<i>Low Inequality Countries</i>	<i>Lowest 20%</i>	<i>Highest 20%</i>
Guatemala	2.1	63.0	Slovak Republic	11.9	31.4
Paraguay	2.3	62.4	Japan	10.6	35.7
Brazil	2.5	63.8	Austria	10.4	33.3
Swaziland	2.7	64.4	Czech Republic	10.3	35.9
New Zealand	2.7	46.9	Finland	10.0	35.8

Source: World Bank, World Development Indicators 2000.

At the Graph 1, per capita GNP and Gini coefficients for both developed and developing countries are plotted. Gini coefficients are ranked in order from lower inequality (low Gini coefficients) to higher inequality (high Gini coefficients). Except the United States and the New Zealand (outliers), which are having high per capita GNP but inequality in income distribution, the negative relationship is observed between per capita income and income distribution. An explanation for high income inequality of the United States could be the decline in the real minimum wage and the rise in investment in high technology equipment during the past two decades (Cole and Towe, 1997).

Graph 1: The Relationship Between Income Distribution and Per Capita GNP (2001)



Using the model:  $\text{LN Per Capita GNP} = \beta_0 + \beta_1 \text{ Gini Coefficient} + \varepsilon$

After running the data, it is obtained that,

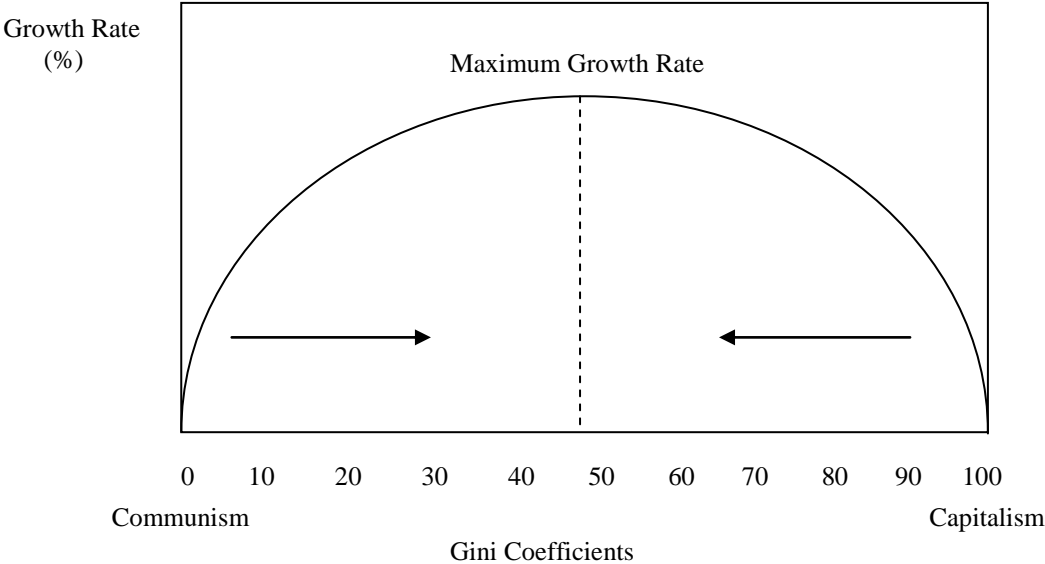
$$\text{LN Per Capita GNP} = 56,86 - 2,35 \text{ Gini Coefficient}$$

(13,095) (-4,158)

The linear regression results supports significant negative relation between income distribution and economic growth. It is significant at the level of 5% and 1 unit decrease in Gini coefficient (more equality) increases Per Capita GNP about 2,35%.

Studies state that there are both positive and negative relationships between income distribution and economic growth. How come this could be possible? The relationship between income distribution and economic growth can be similar to the one at Figure 2.

Figure 2: The Relationship Between Income Inequality and Growth Rate



Theoretically, it is expected that income distribution and economic growth have a nonlinear relationship. In the extreme case of perfect income inequality, Gini coefficient is 100, which means one gets all while the rest gets nothing. Therefore, there is no economic growth because of the lack of demand for goods and services. In the other extreme case of perfect equality, Gini coefficient is 0, which means everybody gets the equal amount of income, but there is insufficient growth because of the lack of production and supply as a result of lack of motivation and low productivity. Between 0 and 100, it is expected that the growth gets higher and higher to the optimum level of income distribution which may also change depending on the level of economic development and other factors (political system, demography, social, religious, geographic factors, etc.) of each country.

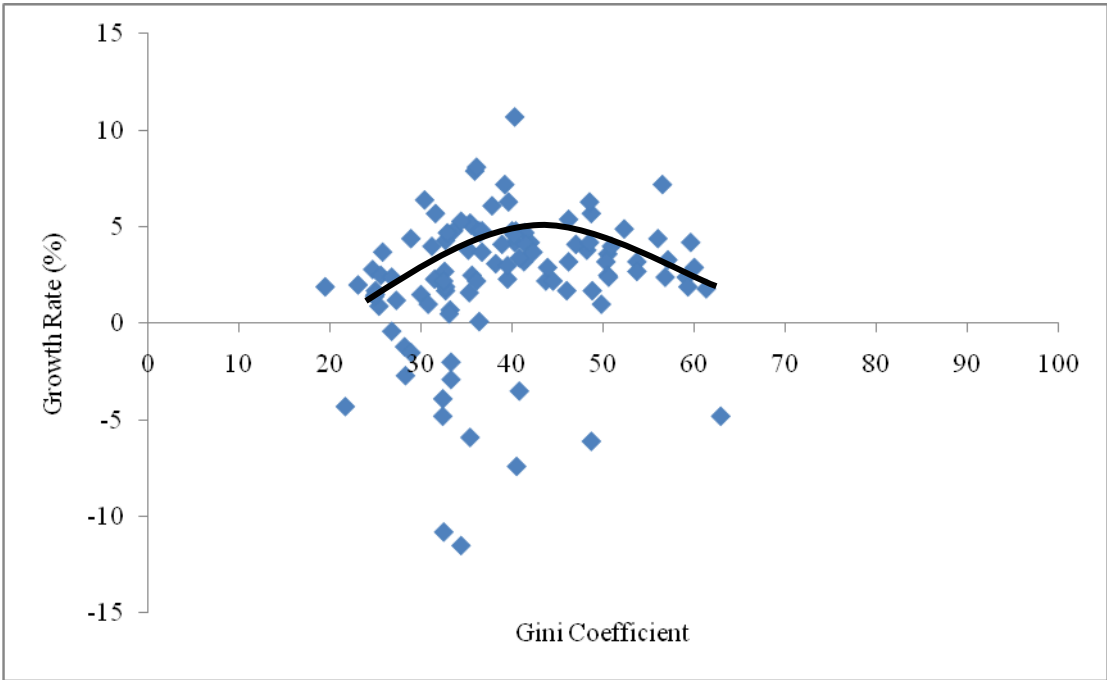


Another important point which can be made is that Gini coefficient 100 refers to capitalism and Gini coefficient 0 refers to communism. Capitalism is mostly criticized because of its income inequality and communism is mostly criticized because of its prohibition for private property rights and reducing individuals' motivation to work more. So the question about which Gini coefficient is optimal is also the answer about which economic system is better. The country needs income equality but capitalism cannot provide; and motivation to work but communism can't provide. Therefore government involvement for redistribution of income might be indispensable. But government most of the time is under the pressure of the powerful groups in the country. In this case, in the redistribution of income the government should not take the main role but the civil organizations of the country, associations, clubs, charitable foundations and local administrations must have main roles to redistribute it. This means more participation into the decision making process requires more democracy.

As it is seen from the Figure 2 that there are two different Gini coefficients which provide the same rate of economic growth. How could this happen? The difference between the developed and the developing countries answers this question. Because, the developed countries have lower Gini coefficients than the developing countries. Therefore, the developed countries are at the left side of optimal Gini coefficient, while the developing countries are at the right side of it. There are some different dynamic forces in developed and developing countries that drive the countries to the optimal Gini coefficients with the highest growth level. While developed civil society and their pressure on the parliament in democratic environment decrease the inequality far away to the left from the optimum level, internal dynamics of developed market economy, in the developed countries, raise inequality by creating the rich and the poor. On the other hand, in the developing countries, the income inequality is higher than optimal level because of the lack of institutions. But as the civil society develops, its pressure on the parliament reduces the inequality to the optimal level.

Gini coefficients and economic growth rates of the developed and developing countries are plotted at the Figure 3 to see if such a relationship exists. Since, there is no such extreme Gini coefficients less than 20 and more than 70 in real world, observed part of the theoretical nonlinear curve is the part of Gini coefficients between 20 and 70. There are negative growth values, since many other factors also affect the economic growth of each country.

Figure 3: Income Distribution and Economic Growth of 105 Countries



In the real world data, plotted above, it is also seen that, instability in growth is observed in the economies with low Gini coefficients much more than in those with high Gini coefficients. After excluding the countries with negative growth rates, we run a nonlinear regression model using data of 89 countries.

Using the second degree nonlinear regression model ( $y = a x^2 + b x + c$ ) below:

$$\text{Economic Growth} = \beta_0 + \beta_1 \text{ Gini Coefficient} + \beta_2 \text{ Gini Coefficient}^2 + \varepsilon$$

After running the model, the result obtained as:

$$\text{Economic Growth} = -6,4561 + 0,4886 \text{ Gini Coefficient} - 0,0056 \text{ Gini Coefficient}^2$$

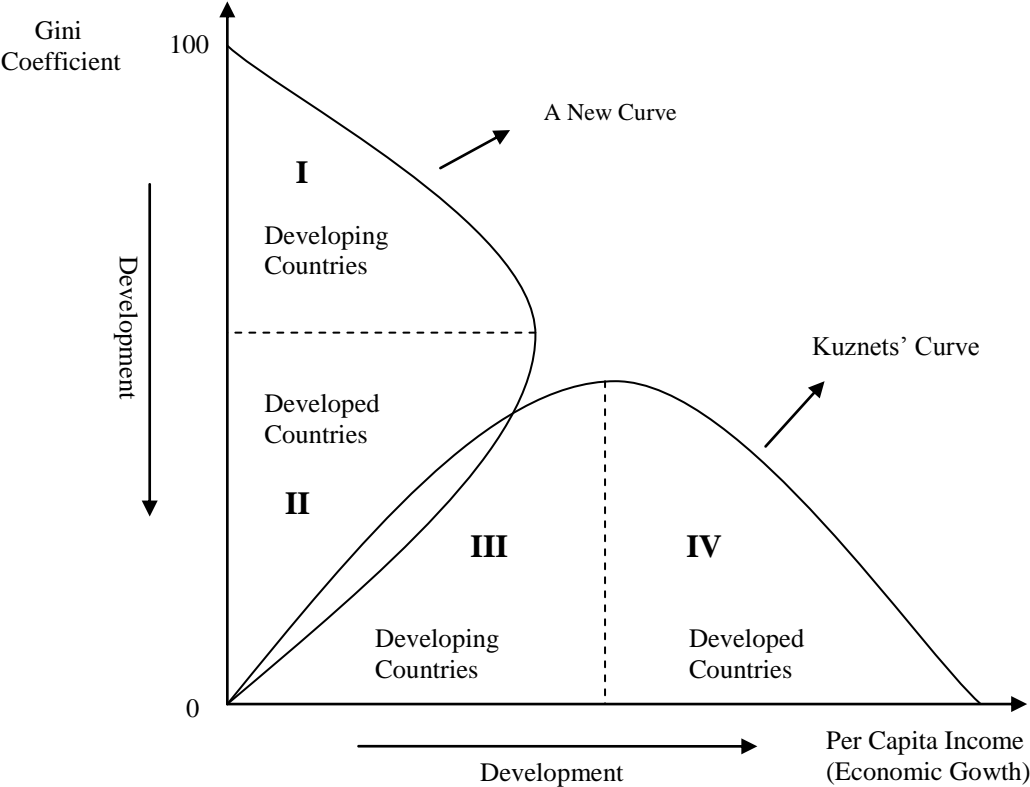
(-2,2596)
(3,4374)
(-3,3018)

Solving the equation for optimum Gini coefficient we get 43,6 which provides maximum growth rate regarding the data.

Kuznets’ curve and the one mentioned in this study are drawn below together to compare. The aim is to show how contrary findings can be obtained by the studies. The Figure 4 shows two different dimensions of the relationship between income distribution and growth. But, it combines contradictory findings of the studies. According to the Figure 4, there may be negative relationship between income inequality and economic growth both in developed and

developing countries. Also, there may be positive relationship both in developed and developing countries.

Figure 4: Comparison of Two Inverted U Curves



The scatter plot of Gini coefficients versus growth rates and Gini coefficients versus Per Capita GNP are shown at the Figure 5 and the Figure 6, respectively. So, the cross-section data looks more similar to the inverted U relation named as New Curve in this study.

Figure 5: Income Distribution and Economic Growth

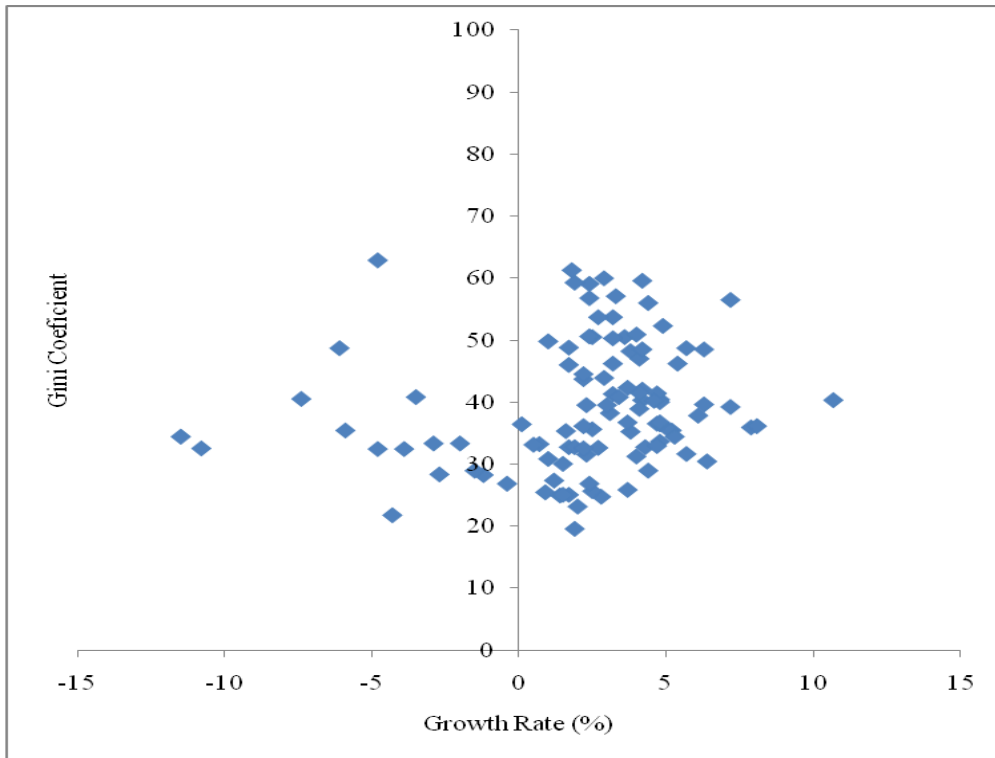
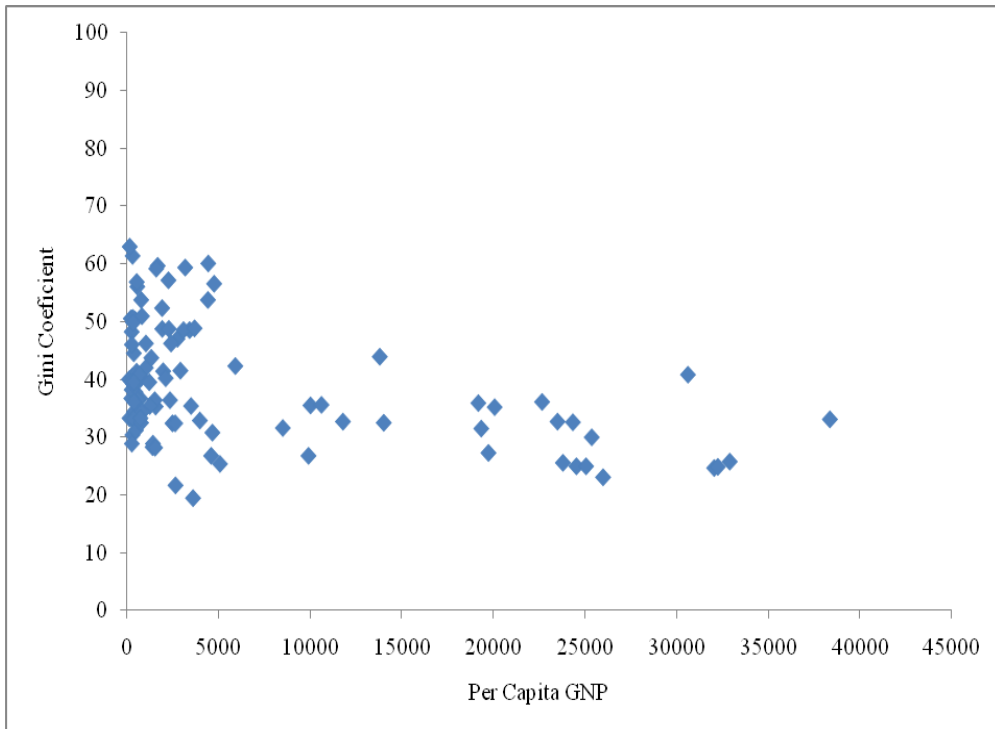


Figure 6: Income Distribution and Per Capita Income



## 5. Conclusion

Studies on the relationship between income distribution and economic growth began with Kuznets in 1950's. Unfortunately, some later studies reveal conflicting results between income inequality and per capita income. Some of the studies find a negative relationship while other studies find a positive relationship.

Income distribution in the developed and developing countries is significantly different from each other. It seems that inequality decreases in developed countries as a consequence of economic and social policies, while developing countries are far away from equality because of prevailing various political, social and economic problems.

In this study, a different inverted U curve is developed between income distribution and economic growth. It looks from different dimension for the relationship between income distribution and economic growth than that of Kuznets' inverted U curve. Since there is a strong relation between income distribution and economic growth, it could be suggested that one of the most important reasons of lower economic growth may be both extreme income inequality and extreme income equality. This study finds that, the optimum income distribution for better economic growth is the one that Gini coefficient equals 43,6 regarding the data. However, there is no unique level of income distribution for countries to follow, since each country is at the different stage of its development or has different economic system. To obtain better economic growth with this income distribution (Gini coefficient equals to 43,6), government should intervene for redistribution of income but, with participation of other nongovernmental organizations or decision makers such as local governments, labor unions in decision making process which requires more and more democracy.

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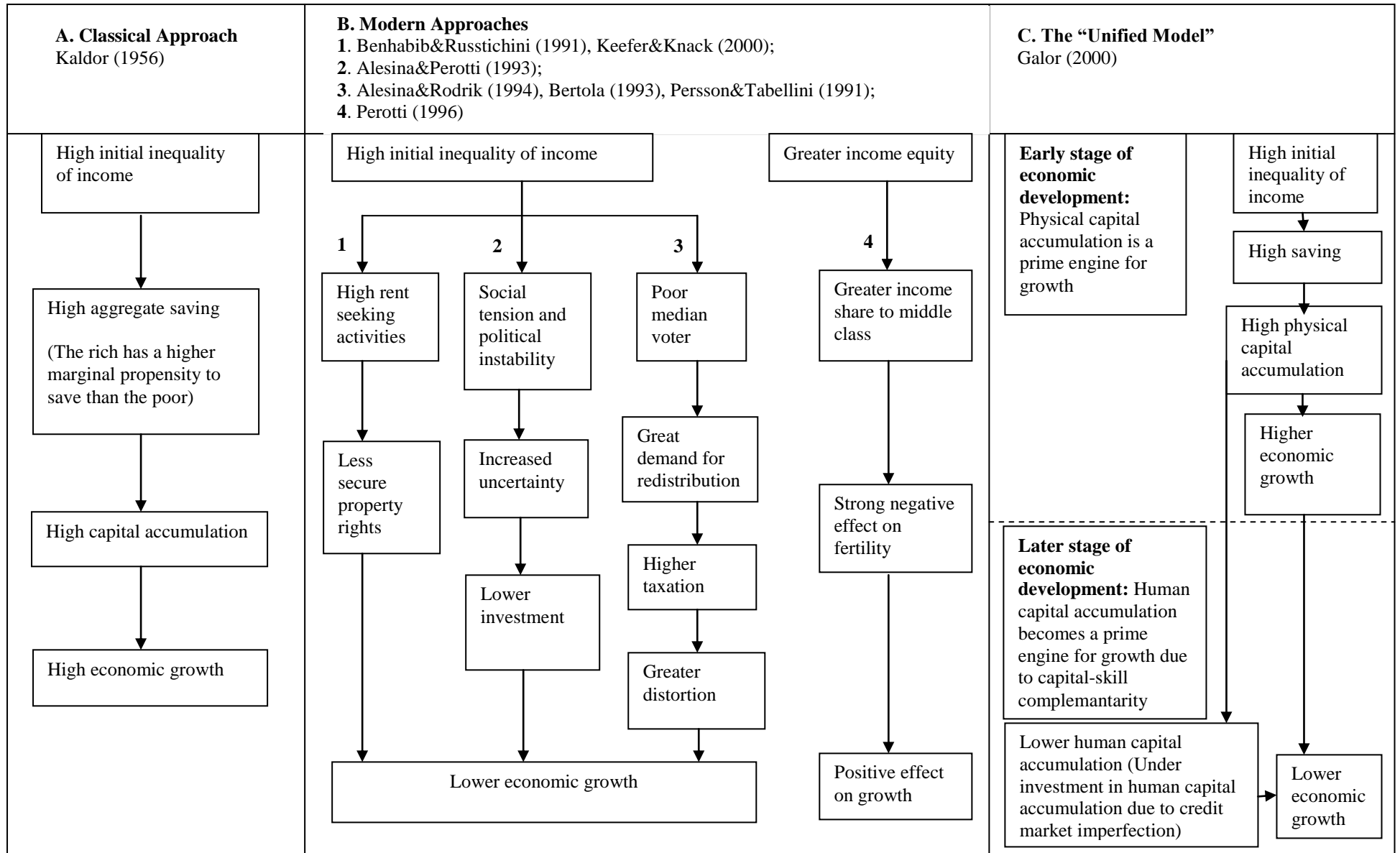
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APPENDIX

Figure: The Channels Through Which Inequality Affects Growth



Source: Thorbecke and Charumilind (2002: 1481).