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Income inequality and economic growth

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ABSTRACT

Despite the extensive existing literature on income inequality and economic growth, there remains considerable disagreement on the effect of inequality on economic growth. Existing literatures find either a positive or a negative relationship. In this paper, we attempt to theoretically examine that relationship with a stochastic optimal growth model. We make the disagreement clear within a single model. We conclude (i) that both are possible – that is, higher inequality can retard growth in the early stage of economic development, and can encourage growth in a near steady state, (ii) that income redistribution by high income tax does not always reduce income inequality. Income inequality can be reduced by higher income tax in a near steady state, but it cannot be reduced in the early stage of economic development, and (iii) that two government polices – rapid economic growth and low income inequality – can be achieved by low income tax in the early stage of economic development, but both cannot be achieved simultaneously in a near steady state.

1. Introduction

This paper examines the relationship between income inequality and economic growth. Income inequality refers to disparities in the distribution of income, that is, the gap between the rich and the poor in a country. What relationship exists between income inequality and economic growth? Let us take two pairs of familiar examples, 1) East Asian and South American countries, 2) the United States and France. One of the most common features in the East Asian countries, where economic growth has been high for the past 30 years, is the declining income inequality (World Bank, 1993). South American countries, on the other hand, have experienced severe income inequality problems and economic downturn at the same time. Based on the case studies of East Asian and South American countries only, we may presume that there is a negative relationship between income inequality and economic growth. However, we can easily find out other cases of industrialized nations, such as the United States and France. In recent years, economic reports say that the economic growth rate of the United States is higher than that of France, and that the United States suffers higher income inequality than France does.[1] Based on the case studies of the United States and France, we may presume that there is a positive relationship between income inequality and economic growth. Therefore it is not possible to simply state a conclusion on either a positive or negative relationship involving these two economic factors.

Concerning the relationship between income inequality and growth performance, we can find both possibilities, a positive or negative, from the existing literature such as the two pairs of examples mentioned above. This paper aims to explain the disagreement consistently using one theoretical model. The results of the early research are summarized in Table 1.[2] The research in the first row of Table 1 conclude a negative relationship between income inequality and economic growth. Oppositely, the research in the second row conclude a negative relationship between the two variables. The research in the third row conclude that there is a nonmonotonic relationship like the inverted U shape. The research in the last row conclude that no unique relationship is present or that it is inconclusive.

For example, Barro (2000) concludes that the effect of income inequality on economic growth is different contingent on the state of economic development. Income inequality in poor countries retards economic growth, but income inequality in rich countries encourages economic growth. Using the panel data, Barro (2000) shows that the effect of income inequality on economic growth is negative in countries with GDP per capita below 2070, and is conversely positive in countries with GDP per capita over 2070. Examining the two pairs of samples mentioned above, if we regard Asian countries and South American countries as examples of developing countries and the United State and France as examples of developed countries, the case of these samples is consistent with Barro (2000)'s conclusion.

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[1] The average annual economic growth rate, measured real GDP per capita, of the United States and France from 1990 to 2007 are 1.916% and 1.322%, respectively. The figures are calculated by the author using the Penn World Table 6.3.

[2] The existing literatures in Table 1 are using different data and analysis methods, respectively. See, Table 1 (page 38) in Sukiassyan (2007) for details.

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Table 1
Previous literatures.

The relationship between income inequality and economic growth	
Relationship	Authors
1) Negative	Murphy et al. (1989), Perotti (1993), Alesina and Rodrik (1994), Persson and Tabellini (1994), Perotti (1996), Alesina and Perotti (1996), Acemoglu (1997), Helpman (2004), Tachibanaki (2005), Sukiassyan (2007), etc.
2) Positive	Okun (1975), Bourguignon (1990), Benabou (1996), Li and Zou (1998), Aghion and Howitt (1998), Forbes (2000), etc.
3) Inverted U	Chen (2003) etc.
4) Not unique or inconclusive	Amos (1988), Barro (2000), Banerjee and Duflo (2003), Weil (2005), Shin et al. (2009) etc.

The positive relationship between income inequality and economic growth might be explained as follows. In developed countries, the saving rate of rich people is higher than that of the poor. Income redistribution from rich people to poor people reduces the saving rate of the economy as a whole and thus could lead to a decline in economic growth. Another reason is that the income redistribution could lower the incentive for the rich to work hard, and that could also lead to an economic growth decline. As a result, we can infer that income equality makes economic growth lower, and income inequality makes it higher.

Meanwhile, the negative relationship between income inequality and economic growth might be explained as follows. In developing countries, poor people are under credit constraint. They do not have the opportunity of investing, and extremely poor people in income inequality cannot even participate in product activity. Income inequality might lead to political and social instability, and consequently to economic growth decline. As a result, we can infer that income inequality makes economic growth lower and income equality makes it higher.[3]

Which explanation is more reasonable? In this paper, we attempt to make the disagreement comprehensible within a single framework. We examine the relationship theoretically using a stochastic optimal growth model composed by heterogeneous agents.[4] We also introduce a progressive tax system into our model and get a numerical solution. We can conclude, in advance, (i) that depending on the state of development, both are possible, that is, higher inequality can retard growth in the early stage of economic development and can encourage growth in a near steady state. This agrees with the Barro (2000)'s result, which shows experimental results using panel data. We make the disagreement clear within the single model. (ii) Moreover, income redistribution by high income tax does not always reduce income inequality. Income inequality can be reduced by higher income tax in a near steady state, but it cannot be reduced in the early stage of economic development. Lastly, (iii) the two government polices – rapid economic growth and low income inequality – can be achieved by low income tax in the early stage of economic development, but both cannot be achieved simultaneously in a near steady state.

This paper is organized as follows. In Section 2, we draw the relationship from Kuznets curve and convergence theory of the new classical. In Section 3, we introduce a heterogeneous model including a progressive tax system. In Section 4, we solve the model numerically, interpret the result and discuss the implications. We then propose a conclusion and develop ideas for the further research in Section 5. Finally, we include an appendix that explains more about the numerical solution results at different value parameters.

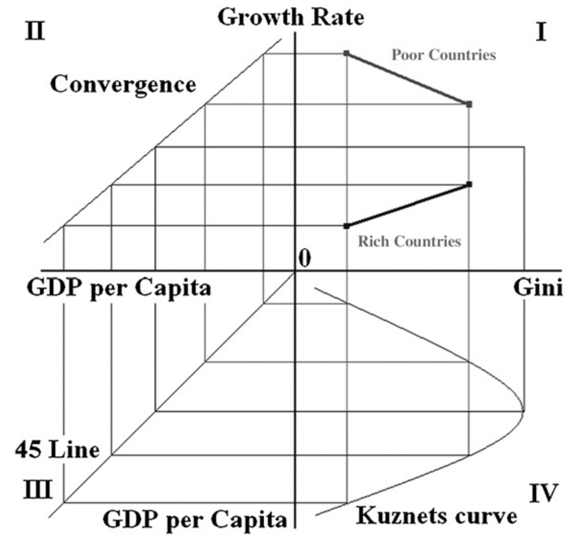

Fig. 1. Conceptual graph.

2. Kuznets curve and convergence theory

Considering Kuznets curve and the convergence theory simultaneously would make us doubt "monotonous relations" – monotonic increasing and monotonic decreasing –, which are insisted by much of the early research. The relations between the Gini coefficient and the economic growth rate may easily be shown through using a simple four quadrant diagram like the one in Fig. 1.

First, we refer to the relationship between the state of economic development and income inequality. Kuznets curve is the curve that shows the relationship between the stage of economic development and income inequality (Kuznets, 1955). Initially, income inequality increases at the early stage of economic development while a country is developing and reaches a peak of inequality. Second, income inequality declines at the matured stage of economic development. If Kuznets curve is correct, the relationship between GDP per capita and the Gini coefficient could be drawn as shown in the fourth quadrant diagram (IV).[5] The vertical axis (↓) of the quadrant diagram shows GDP per capita from less GDP above to more GDP below. The horizontal axis (→) shows the Gini coefficient from less inequality on the left to more inequality on the right.

Next, we refer to the relationship between the level of GDP per capita and the economic growth rate. According to the convergence theory, if the sample is limited to the original OECD countries, the absolute β convergence can be applied (Baumol, 1986, etc.). On the other hand, if the sample is expanded to developing countries, the absolute β convergence cannot be applied (Abramovitz, 1986; De Long, 1988, etc.). However, it is pointed out that a certain kind of convergence phenomenon, that is the conditional convergence, is found between the initial per capita GDP and the economic growth even though the sample is expanded to developing countries when other conditions, such as the different saving rate, the population growth rate, and human capital, are well controlled (Mankiw et al., 1992, etc.). After all, it is assumed that the economic growth rate is high in (initially) poorer countries and economic growth rate is lower in (initially) rich countries if other conditions are well controlled in convergence theory. If the convergence theory is correct, the relationship between GDP per capita and the economic growth rate could be drawn as shown in the second quadrant diagram (II). The horizontal

[3] Details about the reasons can be found in Helpman (2004), Tachibanaki (2005), Weil (2005), etc.

[4] The analyses with an optimal growth model are few even though there are many analyses of cross country data.

[5] However, Kuznets's inverted U-shape hypothesis was rejected by some recent research (e.g. Bourguignon, 1990, etc.). Amos (1988) and Tachibanaki (2005) propose a hypothesis the third curves (Cubic) in a part of advanced country exceeding inverted U-shape.