Economic Modelling 32 (2013) 516–523

Contents lists available at SciVerse ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/ecmod

How does wealth distribution affect firm's incentive to innovate better quality goods?☆

Ling Shen

School of Business, East China University of Science and Technology, Meilong Road 130, Shanghai 200237, China

ARTICLE INFO

Article history:
Accepted 22 February 2013

JEL classification:
D31
D43
O12
O15

Keywords:
Inequality
Economic growth

ABSTRACT

The paper contributes to the literature relating to inequality and economic growth, in particular, we investigate the effects of wealth distribution on the kind of growth driven by innovation, i.e. Schumpeterian growth. Since two types of individuals are assumed, the poor and the rich, Gini-coefficient is treated in two variables, namely the relative wealth of the poor and the population share of the poor, each having a different effect on economic performance. Particularly in the separating equilibrium, an improvement in the relative wealth of the poor impedes economic growth, but a decline in the population share of the poor enhances economic growth. Furthermore, the current paper combines the Schumpeterian quality improvement model and the neoclassic production function. Thus, the impact of wealth inequality on economic growth is through the supply of human capital as well as the demand for better quality goods. Our results suggest that empirical research on the base of Gini-coefficient cannot generate a general relationship between wealth inequality and economic growth.

1. Introduction

The relationship between a country's inequality and its economic growth has been a major concern of economists for more than a century. Yet it is far from being well understood. Some cross-country studies (e.g., Alesina and Rodrik, 1994; Berg and Sachs, 1988; Clarke, 1995; Persson and Tabellini, 1994) show that income inequality negatively impacts long term growth rates. Nonetheless, there also is evidence that income inequality has a positive impact on short or medium-term growth rates (Forbes, 2000), and that the relationship between income distribution and the long-term growth rate is non-linear (Banerjee and Duflo, 2003; Chen, 2003). The ambiguous empirical results imply that there is not a clear relationship between income inequality and economic growth (Barro, 2000). Hence, it is important for economists to develop models which illustrate the possible different effects of inequality on economic growth under different circumstances. The existing theoretical wisdom has proposed either a negative or a positive relationship between initial wealth inequality and economic growth.[1] Hence, none of them alone is consistent with all the above empirical evidences.

This paper investigates the relationship between wealth distribution and the kind of growth driven by innovation. In this framework of Schumpeterian growth, it will be shown that both are extreme cases in an integrating simple model. Thus, our model coincides with the empirical evidences, which are seemingly contradictory. We further the analysis of the relationship between wealth inequality and economic growth in two directions.

First, in a simple model with two types of individuals, the poor and the rich, the distribution of wealth comprises two variables, namely the relative wealth of the poor and the population share of the poor. We argue these variables may have different, even opposite effects on economic growth under certain conditions. Hence, cross-country evidence which is based on the simple regression of the Gini-coefficient on the economic growth rate can be ambiguous. In particular, we may be unable to obtain from such empirical studies recommendations on redistribution policies for achieving a higher economic growth rate as well as a more equal distribution.

Second, we combine the supply of production factors and the demand for the new quality goods in a general equilibrium model. Thus, wealth inequality in two areas can affect the economic performance: the supply side and the demand side. Most of the literature maintains that wealth inequality reduces the aggregate human capital investment, given a neoclassical production function of investment and imperfect capital market. Consequently, inequality has a negative effect on the supply of consumption goods. We name this effect "the supply side effect". The main arguments of the supply side effect are included in the survey of Bénabou (1996). On the other hand, following the literature on endogenous growth with quality-improving innovation (Aghion and Howitt, 1998; Zweimüller, 2000) we argue that innovation is

☆ I wish to thank Prof. Monika Merz, who carefully read the earlier version of this paper and provided many valuable suggestions. I am grateful to Stephan Heim for his assistance. I would like to thank the editor and an anonymous referee for helpful comments. All possible errors are, of course, mine.

E-mail address: vwlde@hotmail.com.

[1] In theoretical modeling, the distribution of wealth is the relevant inequality source. However, most empirical studies use income inequality data as a proxy for wealth inequality because of the scarcity of available data on the distribution of wealth. "It is generally argued that this is unlikely to be a major problem since both measures of inequality generally vary together in cross-sections." (Aghion et al., 1999). In the current paper, initial wealth inequality coincides with income inequality through human capital investment.

0264-9993/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.econmod.2013.02.035

the engine that drives economic growth. This can improve the quality of goods and, in turn, increase the utility of consumers. The innovation cost is compensated by the monopolistic profit after successful innovation. Thus, the incentive of innovation is the monopolistic profit. Wealth distribution can affect the demand for the newly invented goods, and subsequently the price and profit of monopoly. We name this "the demand-side effect".

As we assume that there are only two types of individuals, the monopolistic supplier of newly invented goods can set the price either at the separating level, i.e. only the rich are able to buy it, or at the pooling level that even the poor can afford. Because wealth distribution has different effects in general on the profit in both cases, the relationship between inequality and economic growth is non-linear. Inequality may give rise to a higher incentive for firms to innovate because rich consumers can pay more than the poor for high quality goods. However, on the other hand, the relatively small market share of high quality goods implied by inequality impedes the spread of better quality goods.

This paper shows that in a separating equilibrium, a lower relative wealth of the poor is good for innovation, and a larger population share of the poor is bad for innovation. This result is consistent with that of Foellmi and Zweimüller (2006) and Shen (2009). In Foellmi and Zweimüller (2006) hierarchic preferences[2] are introduced, and innovation induces new goods but does not improve quality. Shen (2009) in addition considers the interdependent relationship between the relative wealth of the poor and the population share of the poor. In the pooling equilibrium, the lower relative wealth of the poor is bad for innovation, and the population of the poor has no effect on innovation. The threshold value which distinguishes between these two equilibria depends on the strength of the supply-side effect. These findings imply that two nations with the same Gini-coefficient could have different economic growth rates if their wealth inequality is reached for different reasons (e.g., low relative wealth of the poor or large population share of the poor).

In a real economy, the causality between income distribution and economic growth can go either way. Economic growth always affects social mobility and income distribution. The early literature on the evolution of income distribution over the process of development used to be dominated by the famous Kuznets hypothesis (Kuznets, 1955). Using both cross country data and time series, Simon Kuznets (1963) found an inverted U-shaped relation. However, in a theoretical model, it is legitimate to assume an exogenously determined income distribution. Of course, we clearly know that this limited assumption excludes the interdependent relationship between inequality and economic growth.

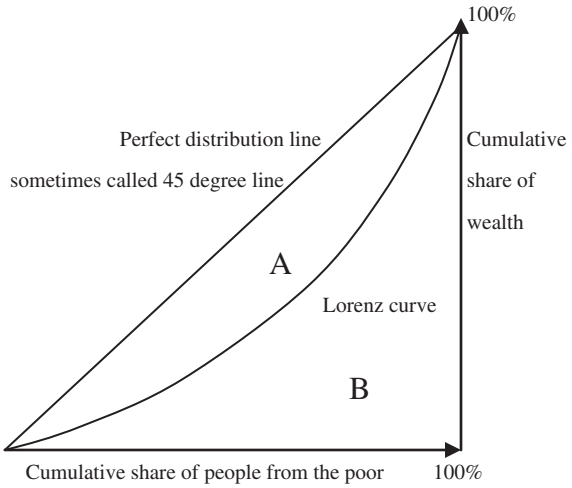
This paper integrates two main streams of theory relating growth and inequality. Recent surveys of the supply-side effect are by Bénabou (1996) and Aghion et al. (1999), where three broad categories corresponding to the main feature are stressed: imperfect financial market, political economy and social unrest. The demand side effect is illustrated by Murphy et al. (1989), Zweimüller (2000), Foellmi and Zweimüller (2006) and Zweimüller and Brunner (2005).

The rest of this paper is organized as follows: Section 2 discusses briefly the measurement of inequality. Section 3 lays out the basic framework. In Section 4 we analyze the equilibrium and in Section 5 we give an example and present some empirical implications with Section 6 concluding.

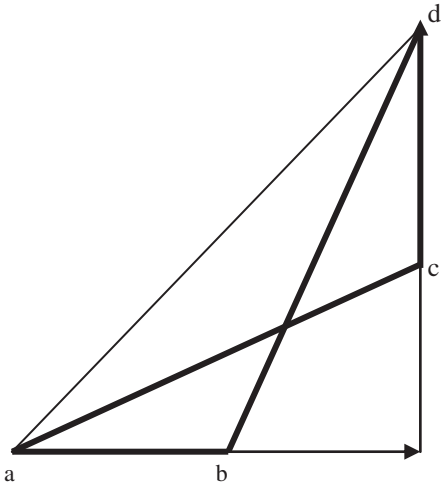
2. The measurement of inequality

Since Corrado Gini, the Italian statistician, published his paper "Variabilità e mutabilità", the Gini coefficient is widely used as a measurement of inequality. It is a number between 0 and 1, where 0 corresponds with perfect equality (everyone has the same wealth) and 1 means perfect inequality (one person has all the wealth; everyone else has nothing). The Gini index is the Gini coefficient expressed in percentage form, and is equal to the Gini coefficient multiplied by 100.

The Gini coefficient is calculated as a ratio of the areas on the Lorenz curve diagram (see Fig. 1(a)). If the area between the line of perfect equality and the Lorenz curve is A, and the area beneath the Lorenz curve is B, then the Gini coefficient is $\frac{A}{A+B}$. The advantages of using the Gini coefficient are clear: it is both scale and population-independent; hence, it can be compared across countries and is easily interpreted; by retaining anonymity it doesn't matter who the high and low earners are; last but not least, it is simple. However, economies with similar wealth and Gini coefficients can still have very different distributions. This is because the Lorenz curves may have different shapes and yet yield the same Gini coefficient. As an extreme example, an economy where half the households have no wealth, and half share the wealth equally has a Gini coefficient of 0.5 (Lorenz curve *abd* in Fig. 1(b)); but an economy with complete wealth equality except for one wealthy household that has half the total wealth also has a Gini coefficient of 0.5 (Lorenz curve *acd* in Fig. 1(b)). In This paper, we address the question: Does the shape of Lorenz curve having the same Gini coefficient matter?



a) Lorenz curve



b)different shapes of Lorenz curve with the same Gini coefficient

Fig. 1. Lorenz curve and Gini coefficient.

[2] "A hierarchy of wants implies that goods can be ranked according to their priority in consumption" (Foellmi and Zweimüller, 2006).