



Two-sided intergenerational transfer policy and economic development: A politico-economic approach

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ARTICLE INFO

Article history:

Received 16 February 2010
 Received in revised form
 16 January 2012
 Accepted 20 February 2012
 Available online 28 March 2012

JEL classification:

H28
 H55
 O16

Keywords:

Public education
 Social security
 Markov perfect equilibrium
 Income inequality
 Economic development

ABSTRACT

We consider an overlapping generations model with public education and social security financed by labor income taxation, in which the overall size of these policies is determined in a repeated majority voting game. We investigate the interaction between these policies and economic development in stationary Markov perfect equilibria. In the politico-economic equilibrium, the labor income tax rate is represented as a linear increasing function of the ratio of the decisive voter's human capital and the average human capital level. A high level of initial income inequality reduces the size of public policies and retards economic growth.

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1. Introduction

This paper considers a situation in which the overall size of public education and pay-as-you-go social security is determined in a repeated majority voting game. In contrast to the existing literature, we focus on stationary Markov perfect equilibria and explicitly investigate the interaction between these public policies and economic development.

In nearly every country, the government provides public education. Public education contributes to human capital accumulation, and a large body of literature investigates its effects on economic development.¹ Public education is also considered to be a redistribution policy from older to younger generations because it imposes education costs for children on their parents.

In democratic countries, the size of public education is determined through political processes. Because public education is a redistribution policy from parental to offspring generations, its sustainability depends on the degree of parental altruism toward their children. If parents are altruistic, they are willing to bear the cost of their children's education, and public education is likely to be sustained. Many studies assume parental altruism in investigating the effects of income inequality on the size of politically implemented public education and economic development (e.g., Glomm and Ravikumar, 1992; Saint-Paul and Verdier, 1993; Lee and Roemer, 1998).

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¹ de la Croix and Michel (2002) survey the recent literature investigating the effects of public education in overlapping generations economies.

According to this logic, if parents are non-altruistic and do not care about their children, they have no incentive to bear the cost of education. In the absence of parental altruism, how is public education politically sustained? There are two streams of literature investigating this question. The first focuses on the complementarity between physical and human capital in the production technology (e.g., [Boldrin, 2005](#); [Gradstein and Kaganovich, 2004](#)). Because of this complementarity, an increase in education expenditure raises the marginal productivity of physical capital. A high return on savings benefits parental generations and makes them willing to sustain public education. These studies, however, assume that parental generations take the size of public education in the next period as given when they vote on the size of public education in the current period. Thus, these studies do not explicitly consider intergenerational conflict in public education.

The second stream, to which this paper belongs, focuses on the role of social security.² Social security, which redistributes income from younger to older generations, is an effective policy instrument to sustain public education. If children bear the cost of social security in exchange for education, their parents have an incentive to sustain public education. [Rangel \(2003\)](#) analyzes the interaction between forward intergenerational goods (such as public education) and backward intergenerational goods (such as social security) in a repeated voting game and shows that the backward intergenerational goods are necessary to sustain the forward intergenerational goods in politico-economic equilibria. Assuming heterogeneity within each generation, [Poutvaara \(2006\)](#) analyzes the characteristics of public education and social security in politico-economic equilibria. These studies adopt trigger strategies as individuals' voting strategies and show that public education and social security are sustained in politico-economic equilibria. In each equilibrium, if parental generations voted to deviate from the prescribed level of public education, they would be punished and would not be able to receive any social security benefits.

[Rangel \(2003\)](#) and [Poutvaara \(2006\)](#) explicitly investigate the intergenerational political conflict over public education and social security and obtain many interesting results. However, because they adopt the concept of a subgame perfect equilibrium, there are numerous politico-economic equilibria. This makes it difficult to predict which public policies are politically implemented.

Furthermore, adopting trigger strategies has another problem. Many empirical studies argue that there is complementarity between public education and parental human capital in human capital formation. If this is the case, the productivity of public education increases with the level of (parental) human capital, and the level of human capital would have crucial effects on the size of politically determined public policies. However, if individuals adopt trigger strategies, the size of public policies depends on all the past history of the voting game, and it is difficult to explicitly investigate how the size of public policies depends on the current level of human capital.

In contrast to the existing literature, this paper focuses on a stationary Markov perfect equilibrium in which the overall size of public policies is represented as a function of the levels of human capital. By doing so, we can restrict the set of politico-economic equilibria and investigate how the size of public policies depends on the levels of human capital. Furthermore, because the size of public policies affects the patterns of human capital accumulation, we can explicitly investigate the interaction between these public policies and the pattern of economic development. To the best of my knowledge, no study has investigated the interaction between these policies and economic development in Markov perfect equilibria.

We consider a simple overlapping generations economy in which individuals with non-altruistic preferences live for three periods (young, middle-aged, and old). Individuals are heterogeneous with respect to their human capital within each generation. They receive public education when young, pay labor income taxes when middle-aged, and receive social security benefits when old. The population size of each consecutive generation grows at a constant and positive rate. We assume a small open economy and focus on human capital accumulation as the engine of economic development. A child's human capital depends on the quality of public education and parental human capital. The government allocates tax revenue to public education for the young generation and to social security benefits for the old generation. All young individuals receive the same quality of public education, and social security benefits are distributed in a lump-sum manner. Thus, these public policies redistribute income from rich individuals to poor ones. In each period, the level of the labor income tax rate is determined under majority voting in which only the middle-aged and old generations have voting rights. Since old individuals are interested only in current social security benefits, they prefer the labor income tax rate that maximizes current social security benefits. Middle-aged individuals with higher income prefer lower tax rates, and those with lower income prefer higher tax rates because the public policies redistribute income intragenerationally. In summary, there exists a political conflict between a coalition of old and poorer middle-aged individuals and a coalition of richer middle-aged individuals, and the level of a decisive voter's human capital is uniquely determined. The welfare of individuals is shown to be single-peaked, and thus, the level of the labor income tax rate is determined to maximize the welfare of the decisive voter under majority voting. Because we assume that the rate of population growth is positive, the decisive voter always belongs to the middle-aged generation. The payoff-relevant state variables are the decisive voter's

² [Kaganovich and Zilcha \(1999\)](#) consider a situation in which the government allocates tax revenue between these policies and investigate the effects of the allocation rules on economic development. [Boldrin and Montes \(2005\)](#) analyze the role of these policies from the viewpoint of economic efficiency. These studies, however, do not consider how the size of public policies is politically determined. [Kemnitz \(2000\)](#) considers a situation in which individuals affect the decisions of the government through voting and lobbying activities. In his paper, however, it is assumed that the government does not take into consideration any effect that current policies would have on future policies.

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