

## Which Type of Pension System Leads To Higher Welfare?

Wencke Boehm  
University of Bielefeld

Which type of pension system leads to higher welfare? In this paper we try to answer the still open question. As it is well known from the literature the existence of a fully funded (FF) pension system leads to higher economic growth than a pay-as-you-go (PAYG) system, but it is not clear how they influence the utility of the population through their effect on wage-rates and rates on return of capital. The main focus of this paper is the individual utility under different pension systems. We incorporate a stochastic growth of the population and consider an exogenous given growth of human capital. The majority of papers, which treat different pension systems, investigate their effect on capital accumulation and growth. The open question in our opinion is, whether a system (fully funded), which leads to higher economic growth is also the best for the individual utility. We will show that this is not necessary the case. We use a two-period OLG-Model with a closed economy. We are able to show that PAYG leads to higher welfare under specific conditions i.e. for different economies there are different pension systems leading to higher welfare. The demographic change heads to a shrinking number of contributors (which is a problem for the accommodation of the old-age pensioners). Interesting to know is whether one of the pensions systems is able to cope better with this situation than the other one. One aspect of adjustment is the investment in better education hence in human capital formation which is in this paper exogenously given. We show that an enhancement of human capital formation will lead to higher welfare under both pension systems.

As the population of most industrialized countries become older and older over time, the question how to ensure their old-age wealth becomes more important. In these countries we observe a demographic change, therefore the old generation will become the dominant fraction of the population. We observe a median age of the population in several European countries and Japan above 40 years. In Germany for example the median age is 44.9, in Italy it is 43.5 years. For a comparison, the population of India has a median age of 26.2. The World Factbook provides time series from which we can clearly conclude that the population in many countries grows old. This may be due to better health care, healthier ways of life, less hard work and many more. In most European countries, except Netherland, the old-age security is organised in form of a pay-as-you-go (PAYG) pension system. This means that the young working part of the population has to pay for the pension payments of the old and retired part of the population. As the fraction of young working individuals is shrinking, they have to give individually more from their wage income or the retirees will reserve a lower pension payment by constant contribution rates. Both scenarios are not optimal. Often discussed is a transition from PAYG to a fully funded (FF) pension system to face the problem of less contributors and more beneficiaries as the PAYG system is not suited to provide an adequate level of retirement payment at acceptable costs for the contributors. Some observers think that the existing pension system has to be changed in a drastic way as they see it already on the 'verge to collapse' (Borsch-Supan 1998). The health of the pension is of major interest, as Diamond, Orzag (2005) exposed for the USA that for two-thirds of the elderly beneficiaries the pension payment is the majority of income and for 20 percent of the beneficiaries it is all income.

Meijdam and Verbon (1997) analysed the effect of aging under PAYG on the consumption and observed a decrease of individual utility in the long run. Bloom et al (2007) incorporate the life expectancy into the individual savings and retirement decision. They analyse the effect of demographic change on the capital accumulation under PAYG as well as under a fully funded pension system, whereas Abio et al (2003) question whether the introduction of a PAYG system can influence the endogenous fertility rate. As the quantity of young worker who contribute to the pension system decreases, one idea is to focus on the quality i.e. the human capital of workers. A whole strand of literature analyses the impact of human capital on economic growth. Ludwig and Vogel (2009) showed that a decrease of the fertility rate increases the amount spend on education, if the contribution rates to the PAYG pension system are held constant. Kaganovich and Zilcha (2010) analysed whether the contribution to education differs under PAYG and FF and which system leads to higher economic growth. They emphasized that under specific conditions FF leads to higher rates of economic growth, physical and human capital accumulation. Similar is the paper of Kaganovich, Meier (2008), which considers a small open economy. In addition they considered the consumption of the individuals under different scenarios and claimed that young voters prefer a fully funded system over a PAYG arrangement.