

Managing Sustainability of a Defined Contribution Pension System perturbed by a demographic wave

by

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Abstract. The starting point of our work is the model of the logical sustainability, a method for managing a pay-as-you-go pension system provided with a fund proposed by Angrisani (2006 and 2008) in the context of defined contribution schemes. This model provides conditions able to ensure the sustainability in a logical mathematical key. In particular, a rule on the rate of return on the pension liability, which considers the growth rate of productivity as well as the rate of return on the fund, is provided in order to stabilize the level of the unfunded pension liability in relation to wages. In this context, we consider the problem stemming from a demographic wave that puts pressure on the sustainability of pension schemes: principally, but not exclusively, we refer to the problem of the baby boomers retirement, which will take place in the following decades in several developed countries. The main contribution of our study is to provide an operating method, developed on the basis of a general principle, referred to as the separation principle, which allows a defined contribution pension system, in a state of stable sustainability, to overcome the issues of sustainability (and, nevertheless, of intergenerational equity) arising when a demographic wave disrupts the system equilibrium. This principle departs from the existing literature on pension systems because it leads to overcome the classical juxtaposition between a funded or a pay-as-you-go scheme. Indeed, we prove that in order to tackle the demographic wave problem it is not possible to exclusively follow a PAYG scheme neither is it necessary to shift to a fully funded scheme. The separation principle proposed asserts that only the unmanageable pay-as-you-go part of the pension

system, namely the group of individuals of the demographic wave, needs to be fully funded. Numerical illustrations are also provided.

In this study, we neglect problems such as longevity and/or price stochasticity that, although relevant, involve technicalities but do not prejudice to the basic principle underlying our work.

However, it should be noted that an extension of the logical sustainability model, where the two variables, the growth rate of productivity and the financial rate of return on the fund, are both modelled by stochastic processes, has already been presented at the MIC Conference 2015 in Portoroz.

Keywords: defined contribution pension system, logical sustainability, demographic wave.

Main references

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