Macroeconomic implications of demography for the environment: a life-cycle perspective

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Abstract

At the beginning of the XXIst century, most of the industrialized economies face a unrevealed double challenge: the never seen and rapid deterioration of the environment which calls for immediate and important environmental policies at a large scale, and a continuous ageing of the population which have major macro-economic implications in terms of saving, retirement, education, growth.

The purpose of this paper is to investigate how the current demographic changes (the declines of the birth rate and the mortality rate with the improvement of the health status) may affect both the macro-economic effects of the environmental policy and the magnitude of these effects. Indeed, on the one hand, environmental policies are usually detrimental for economic activities because they tax industries or turn away resources from innovative or growth-promoting activities (see the survey by Ricci (2007) for theoretical references). Furthermore, the deterioration of the environment, like the global warming or the air pollution, hurts the weakest individuals who are the child and the elderly (see Pautrel (2008) for some
references about the empirical literature on the detrimental impact of pollution on health). On the other hand, the ageing of the population affects saving behaviours, the labor supply, education, growth,... (as reported by Bloom et al. (2003), Bloom and Canning (2004) or Bloom et al. (2007), amongst others) and it increases the part of the population the most weakened by pollution. Therefore it may affect the macro-economic impact of the environmental policy and its scope.

To investigate this point, we use a Yaari (1965)-Blanchard (1985)-Buiter (1988)-Weil (1989) overlapping generations model in which we integrate environmental concerns. We also introduce life-cycle properties by adding an age-earnings profile to capture the effect of the age-structure of the population on the per capita labor supply (see Bloom et al., 2002, 2004). We investigate the effects of the environmental policy and how demographic changes affect both the economy and the influence of the environmental policy, in the case of an exogenous technical progress and in the case of an AK-type endogenous growth. Finally, we account for two important features of the current ageing: health and how pollution affects it, the social security system which modifies, amongst others, the saving behaviour of individuals during their life.

Our very preliminary results (without health and social security) are that, with exogenous growth, the demographic changes may modify the influence and the scope of the environmental taxation on the steady-state per capita output or physical capital when age-earnings structure is taken into account. With endogenous growth, the effect of the environmental policy on growth becomes ambiguous and may be positive according to the age-earnings structure and the demographic parameters.

References


