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Life expectancy, retirement and endogenous growth

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Abstract

In this paper I address the links between life expectancy, retirement age and economic growth. I build a finite horizon *OLG* model with exogenous retirement in which human capital accumulation drives endogenous growth. The return on individual investment in human capital depends positively on the remaining active years. Postponing retirement age raises the return and investment in human capital, and the proportion of working individuals, thus increasing the sustainable growth rate. Increments in life expectancy do *not* increase the growth rate by themselves, but reduce it: optimal investment in human capital is not affected and the proportion of retirees becomes larger. Therefore, increases in life expectancy lead to higher growth rates *only if* they are accompanied by simultaneous increments in the working period.

JEL classifications: D91; E17; O41

Keywords: Life expectancy; Retirement; Growth

1. Introduction

'Life expectancy alone is one of the strongest explanatory variables of growth in GDP', World Health Organization.

In this paper I address the issue of how life expectancy and retirement age are linked to economic growth. To this end I build a finite horizon *OLG* model with

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exogenous retirement in which human capital accumulation drives endogenous growth and which I solve numerically.

The issue of the effects of the reduction in mortality rates and the resulting increases in life expectancy upon economic growth rates has recently been addressed in the literature through both empirical and theoretical studies.

Concerning empirical studies, the hypothesis that the reduction in mortality rates has caused higher levels of investment in human capital and, therefore, augmented growth rates is partially supported for various economies. Thus, Kalemli-Ozcan et al. (2000) show an increase in life expectancy at birth along with an increase in average numbers of years of schooling in England. They claim that after averaging across lower income countries, there is apparently a connection between increases in life expectancy at birth and increases in gross secondary school enrollment that is positively connected with higher growth rates observed.[1] Rodríguez and Sachs (1999) also show a positive relationship between life expectancy and growth for the case of Venezuela. Preliminary data from Latin American and Caribbean countries show that *GDP* growth is statistically associated with life expectancy: for instance, estimates based on data from Mexico suggest that for any additional year of life expectancy there will be an additional 1% increase in *GDP* 15 years later. (World Health Organization, 1999, Box 1.2, p. 9). Barro and Sala-i-Martin (1995) estimate for a sample of 97 countries that a 13-year increment in life-expectancy would increase the per capita growth rate by 1.4% per year, although they also find some exceptions.[2] Malmberg (1994) gives another exception: higher growth was achieved when middle-aged persons were numerous, whereas increases in dependent age groups led to lower per capita growth in Sweden.

A common result in most theoretical studies which include some sort of *human capital* is that an increase in life expectancy lengthens the period needed to recover investment in human capital, which translates into higher returns on individual education or human capital investment. This augmented return will give rise to higher levels of investment in human capital which in turn will raise growth rates. Ehrlich and Lui (1991) show in a three overlapping generations model how improvements in longevity lower fertility, thus raising educational investment and long term growth. In a similar setup Meltzer (1995) obtains that mortality reductions may favor economic growth by increasing educational investment. Kalemli-Ozcan et al. (2000) show in an overlapping generations model à la Blanchard–Yaari that if mortality drops, life expectancy increases, so that an augmented life horizon to enjoy the return on human capital investment gives rise to higher schooling (human capital investment), although growth is not affected as the growth rate in their model is identically equal to zero. In a similar setup, Hu (1995) simulates that the projected population aging in the US is likely to increase the growth rate of output by approximately 0.4%. In this case, the interpretation is that population aging increases saving, and thereby capital accumulation. In a slightly modified model,

[1] See other references cited there: Ram and Schultz (1979), Preston (1980) and Meltzer (1995).

[2] Countries in which a higher life expectancy has not resulted in a higher growth: Ghana, Mozambique, Uganda, Zaire, Haiti, Guyana, Uruguay and Venezuela, even though all of them have exhibited a higher schooling level.