

The dynamics of human capital-specific old-age dependency ratio in Europe

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Short abstract

Rising human capital has a positive effect on most aspects of population ageing. Nonetheless, purely demographic consequences of rising human capital are rarely taken into consideration in the analysis of the ageing process of a population. By means of demographic projections, we show that increasing human capital, under specific conditions, may counteract the positive consequences of increasing human capital on population ageing rather than straightforwardly alleviating them. After showing this result for Italy, we replicate our analysis for selected European countries, characterized by different levels of inequalities by human capital.

Keywords: ageing; human capital; education; income; projection; EU-SILC.

Introduction

Many authors consider an increase in human capital as a major factor for alleviating the negative effects of population ageing (Lee and Mason, 2010; Lutz et al., 2004). In the macro-economic framework, it is underlined that human capital increases the labor force's productivity (Skirbekk, 2008) and this will finally facilitate the allocation of the resources required for the retired population (Kemnitz and Wigger, 2000). From a demographic viewpoint, the increase in human capital will offset the shrinking working-age population as the most educated tend to work longer and retire at later ages (Crespo Cuaresma et al., 2009).

Research on how rising human capital affects the consequences of population ageing does not explicitly consider the impact of the elderly population's human capital that is shaped by earlier schooling, training and work experience. Hence, a rise in the human capital of the working-age population will generate economic growth, but upon retirement it will also increase the economic burden by a corresponding rise in pensions.

The dynamics of the human capital related ageing has been already examined using data for Italy (Philipov et al., 2014). Results have shown that under specific conditions, a constant or a moderately increasing human capital may cause aggravation of consequences of population ageing rather than their alleviation, which can be achieved under a faster increase in human capital.

The aim of this paper is to extend the analysis to a large set of European countries, to explore whether our findings hold in different educational, income, and pension settings in a dynamic way.

Data and Methods

Our research method is based on the construction of a population disaggregated by age (as of age 20) and sex where all individuals are weighted according to the level of their respective human capital. As already shown in Philipov et al. (2014), we define the weights for the working-age population by using earning functions and the weights for the elderly population by using human-capital-specific public pension levels, both depending on education levels.

Data on human capital (education, earnings and pensions) come from the European Union Statistics on Income and Living Conditions (EU-SILC) for 2011. In particular, we use the information about earnings and education of respondents aged 20-64, or about the amount of public pension received and education of respondents aged 65 and above. Education is the highest education level attained (divided in low, ISCED 0-2, medium, ISCED 3-4, and high ISCED 5-6).

We examine the dynamics of ageing by using a human-capital-specific old age dependency ratio (HC-OADR, see Philipov et al. 2014). Its estimates are based on multi-state population projections by levels of education, based on the dataset of the Wittgenstein Centre population projections (2014), from present until the year 2100.

Once again, our analysis of how human capital affects ageing is not based on forecasts but on population projections. Indeed, these projections permit us to examine the effect of one

specific force – namely human capital – on ageing under the ceteris paribus assumption, i.e. net of the effect of any other factors. Therefore, our analysis is purely demographic and extends the conventional OADR.

In this paper we show the different dynamics of the HC-OADR as compared to more conventional measures of ageing for the following countries: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK.

Preliminary results and discussion

Previous results for Italy have shown that the HC-OADR produces a trend of population ageing that is faster than the trend received with the conventional OADR. Therefore, under specific conditions, a constant or a moderately increasing human capital may counterbalance the positive consequences of population ageing rather than straightforwardly alleviating them.

Preliminary results on the large set of European countries underline that the same pattern found for Italy is replicated for the majority of the countries (faster or much faster ageing in a population when we consider its structure by human capital distribution), see table, column (1) and (2).

Table – Comparison of HC-OADR and OADR, year: 2100.

Indicator:	Relative increase in HC-OADR compared to the relative increase in OADR, year: 2100			
	(1)	(2)	(3)	(4)
Patterns	Much faster ageing when considering human capital	Faster ageing when considering human capital	Similar ageing when considering human capital	Slower ageing in OADR larger than in HC-OADR
Countries*	Belgium, Romania, Italy, Austria , France, Greece, Spain, Portugal	Germany, Sweden, Poland, Denmark, Ireland, Netherlands, Norway	Hungary, Bulgaria, Switzerland, UK, Finland, Slovenia	Czech Republic, Latvia, Estonia, Lithuania, Slovakia

Source: our elaborations

Only in few countries the dynamic of the human capital weighted ageing indicator is slower than the conventional measure (for Czech Republic, Latvia, Estonia, Lithuania and Slovakia, column (4) in table), a result that is opposite to that of Italy. For some other countries,

considering the contribution of the human capital composition of the population on the ageing process does hardly make any difference (column (3) in table).

Further analysis will explore the reasons for the differences among countries. Results depend indeed on a combination of effects. Among them, the type of the education system and the speed of the education expansion in a country, but also the return to education in terms of income and pensions, and the way pensions are computed in relation to past earnings (this aspect depending on the pension systems).

Increased levels of educational attainment provides multiple benefits at both the individual and societal level. However, the significant negative effect should not remain unconsidered as the burden of demographic change could be exacerbated by the increase in the share of more well-educated people.

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