

ACTIVE AGEING AND HUMAN CAPITAL

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Abstract

2012 was the European year for active ageing and solidarity between generations. One of the possible ways to solve the impacts of demographic changes in ageing societies is labor force participation of the elderly at much higher rates. In this context, there is a Europe-wide interest in reinforcing the importance of human capital, which contributes to the output of values, goods and services. In today's ageing populations life expectancy for men and women is increasing, education persists also in higher age groups and for this reason it is important to support the development of human capital in relation to education and employment. The target of this paper is to analyze the forms of human capital investments and to characterize their economic and social profitability for the society. Furthermore, this paper focuses on the issue of active ageing, which is related to the life quality and potential of seniors and is measured by the Active ageing index.

Key words: Human capital, Population ageing, Active ageing, Active ageing index

JEL Code: J14, J17

Introduction

Presented paper focuses on the concept of human capital and active ageing. It is necessary to study these terms in relation to other economic and social indicators, for example to education, GDP, employment rates.

1 Concept of active ageing

Mortality, life expectancy and its development have always been important topics not only in the demographic area (Šimpach; Dotlačilová; Langhamrová, 2013). Life expectancy reflects improving mortality conditions and prolongation of length of human life (Langhamrová; Miskolczi; Langhamrová, 2011). As an impact of the increasing proportion of old people in the majority of European populations, current attention is paid to the extent to which seniors will survive their lives healthy and actively. Human life prolonging is a positively evaluated phenomenon as a result of advanced health care and better living conditions. Population ageing is a fundamental ongoing demographic process, which is the object of interest of

governments and social institutions. For this reason it is necessary to reflect the economic and social potential of the older population (Avramov; Maskova, 2003).

Their potential can be returnable in case seniors live an active, healthy and fulfilling life. It is important to spend as many years as possible in good health, with no health limitations. In this context, the European year 2012 is associated mainly with the aim „to raise awareness of the value of active ageing, highlighting the useful contributions older people make to society and the economy, to identify and disseminate good practices, and to encourage policy makers and stakeholders at all levels to promote active ageing” (Unece, 2013). A quantitative measure of active ageing is the index of active ageing (AAI), which consists of four main areas – employment, participation in society, independent living and capacity for active ageing (Zaidi, 2013).

1.1 Active ageing index and other economic measures

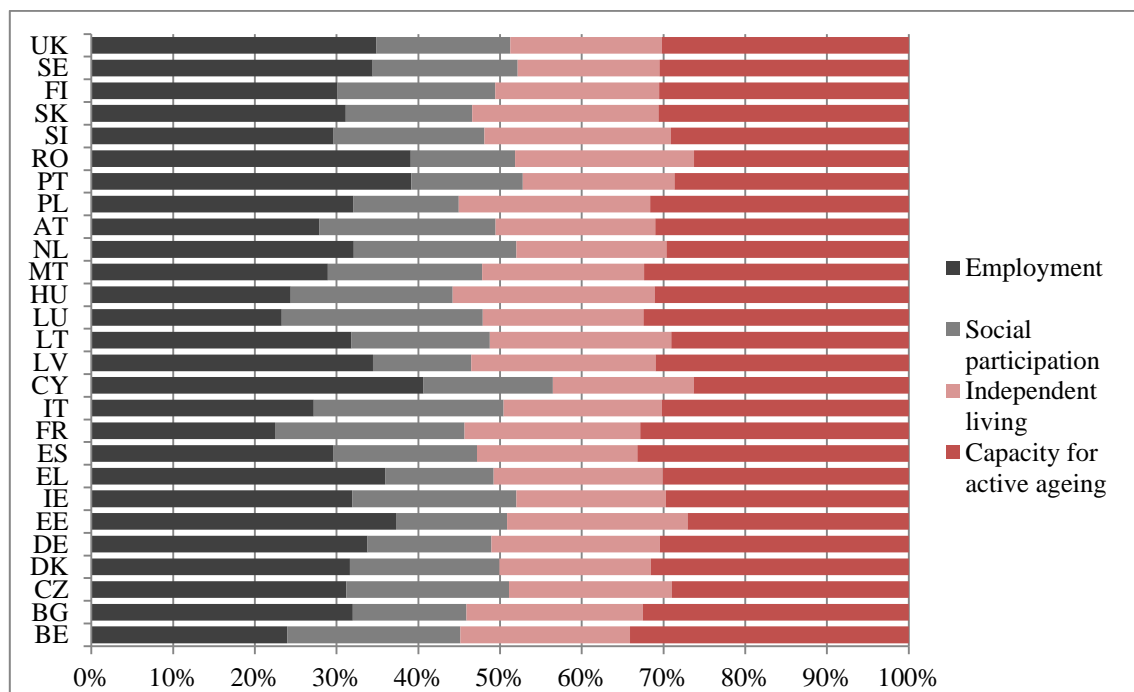
Contribution of each component of active ageing index to the total value of the index differs for EU member states. In most of the countries better results were achieved for men compared to women. Significant differences are reflected in the area of employment, in which men contribute to the active ageing index almost twice as much as women (for men the component of employment ranges from 20 % to 40 % in all countries, while for women often does not reach even the level of 20 % – see figures 1 and 2). Another noticeable difference is in the relative proportion of the component capacity for active ageing, which forms a greater part of the active ageing index in case of women. The highest relative contribution is in Luxembourg, Belgium, Malta and Poland (see figure 2).

For all countries there is an untapped potential for future progress. Visible difference exists between countries of Central and Eastern Europe compared to Western and Northern Europe. Generally, according to AAI, leading countries are principally Nordic countries (especially Sweden and Denmark), followed by the United Kingdom and the Netherlands. From Central and Eastern Europe best results were achieved in the Czech Republic. On the other hand, Hungary, Slovakia and Poland reached the worst results.

There are many ways how to measure the economic dependancy in the population (Fiala; Langhamrová, 2013). It is important to follow the development of AAI concurrently with other economic indicators. When examining the correlation between GDP and AAI, we showed direct linear relationship (Pearson correlation coefficient $r = 0.53$), which means that with increasing GDP the value of AAI is increasing as well (see figure 3). Higher GDP creates better conditions for active and healthy ageing. On the other hand, in case of Cyprus,

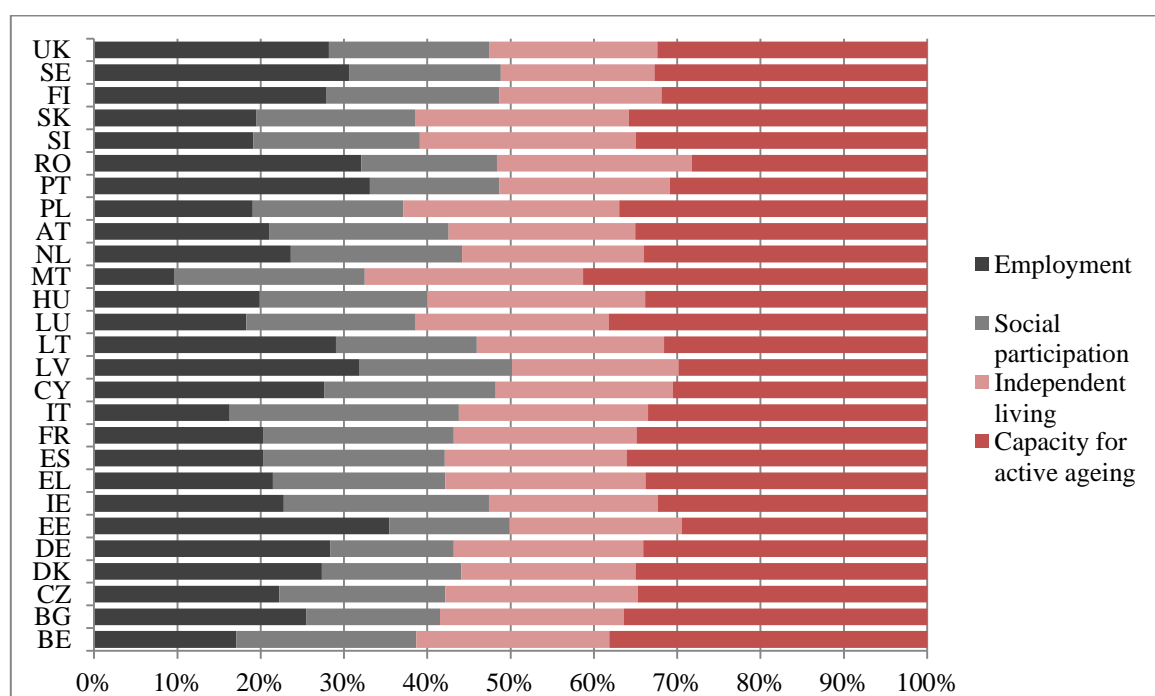
AAI reaches high values (AAI = 36.3 in 2010), despite lower values of GDP compared to other developed European countries.

Fig. 1: Contribution of the domains to the overall active ageing index – men, 2010



Source: UNECE, own construction

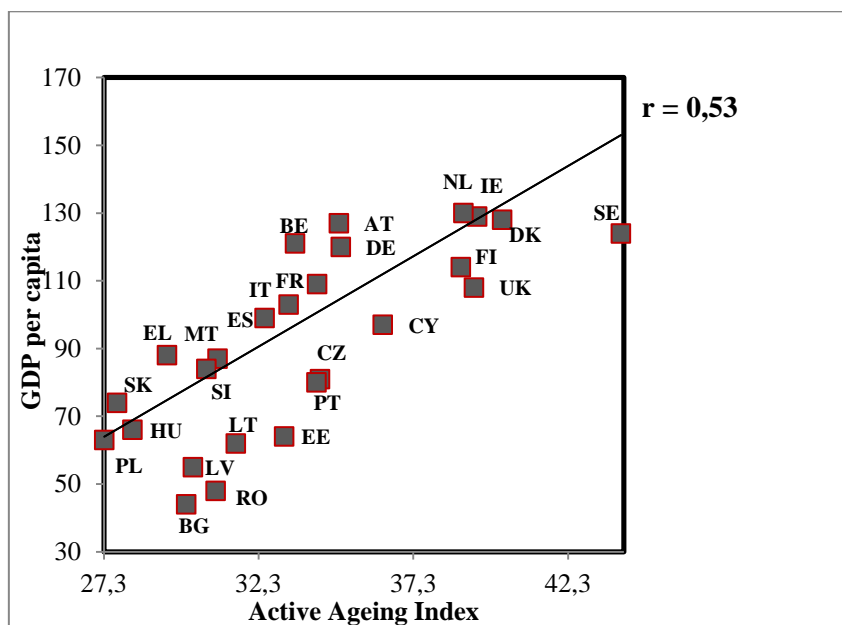
Fig. 2: Contribution of the domains to the overall active ageing index – women, 2010



Source: UNECE, own construction

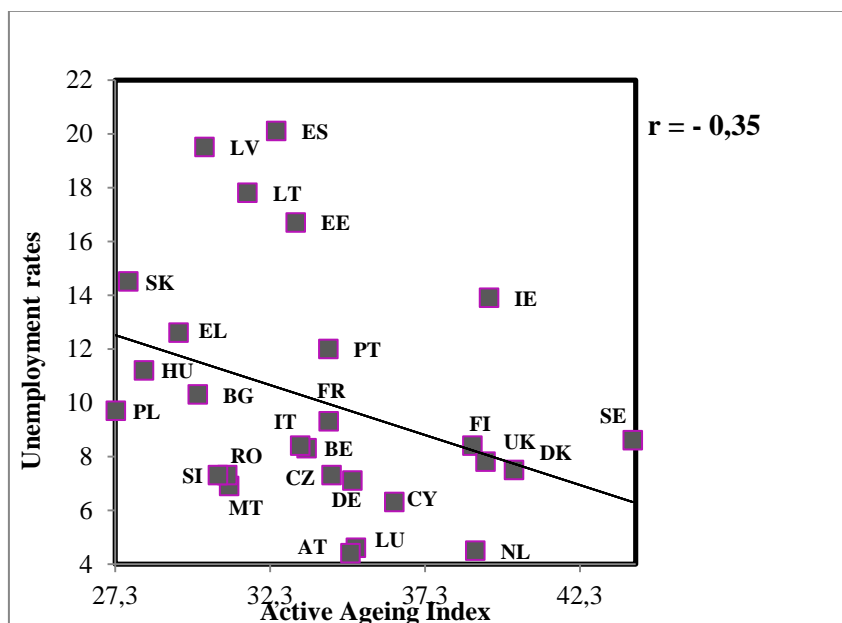
AAI is affected also by the unemployment rate in the studied countries. Generally, the active ageing index is decreasing with increasing unemployment rates ($r = -0.35$). There is an indirect linear relationship. For example, in Luxembourg, the average annual unemployment rate was 4.6 % and the active ageing index was equal to 35.1 in 2010 (see figure 4).

Fig. 3: Correlations between AAI and GDP, 2010



Source: Eurostat Database, UNECE, own construction

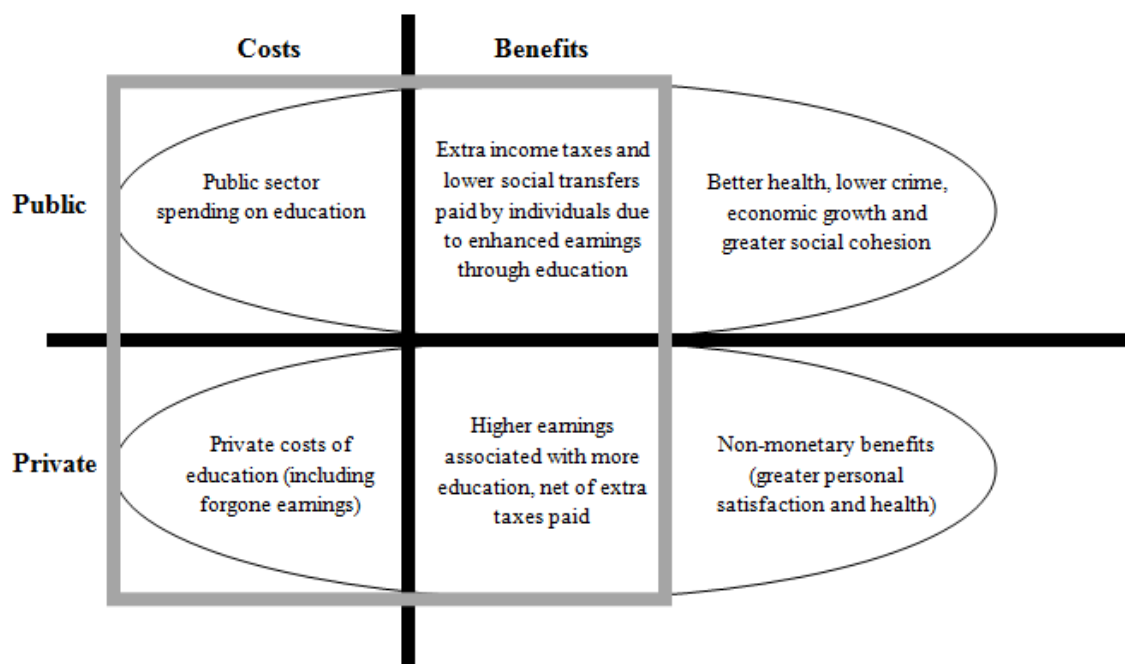
Fig. 4: Correlations between AAI and unemployment rates, 2010



Source: Eurostat Database, UNECE, own construction

2 Human capital and social returns

Fig. 5: Public and private costs and benefits of education



Source: Human capital investment: an international comparison. OECD, own construction

The diagram created by the OECD in 1998 distinguishes between costs and revenues related to education in public and private. Top measurable are items in a gray square. But this contribution will focus on public spin-off social effects (benefits) education. Costs of education can also further influence the health status of the population, criminality, economy, environment and family life in the country. It follows that education can be considered as a source of future well-being of the population, so the investment in education each country pays off (Mertl, Vychová; 2009).

In this paper is studied the relationship between public spending on education and social effects of these costs in the Czech Republic since 1995 to 2012. Among the investigated effects were chosen GDP (calculated expenditure method), crime rate (crimes per 1000 mid-year population) and life expectancy. Czech Republic belongs to Belgium, Bulgaria, Estonia, Lithuania, Latvia, Hungary, Slovakia and Slovenia by its values of GDP, inflation rate and unemployment rate (Löster, Pavelka, 2013). First of all life expectancy was chosen because it evaluates the health status of the population and also belongs among the indicators evaluating aging population. The goal is to find whether the relationship between spending on education with social returns also exists in Czech Republic during mentioned period. The relationship between spending on education and social effects of these costs will be studied using time series in the statistical software EViews. At first will be verified

Dickey-Fuller test whether the time series and their residues are stationary or not. The ideal situation is when the investigated time series are non-stationary nature and their residues are on the contrary stationary.

2.1 Dependence of GDP on spending on education

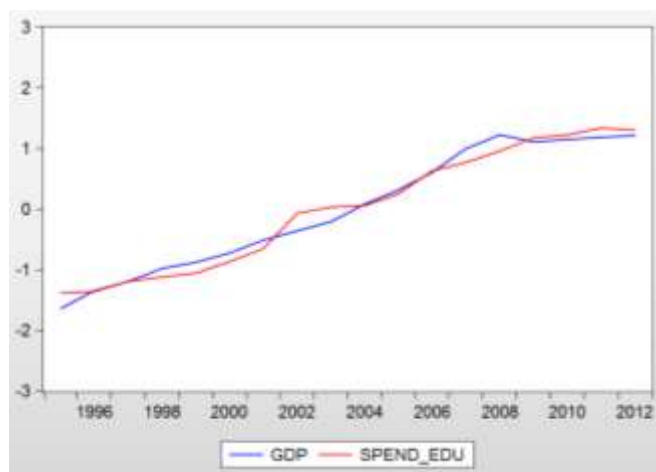
When verifying the stationarity of time series and their residues was found that the both time series are non-stationary and their residues are stationary. This makes it possible to say that there is cointegration regression and between time series exists a relationship. Korelogram indicates no evidence of autocorrelation, so it wasn't necessary to dynamize the model. Then there was a diagnostic control of the model. Control confirms the absence of autocorrelation. Further was tested the normality of the data, which was also confirmed. And last but not least was tested conditional heteroskedasticity, which wasn't confirmed, which is good for a model diagnosis.

Model the relationship between the time series can be described as follows:

$$GDP_t = 275285,2 + 19,47 * SPEND_EDU_t + a_t \quad (1)$$

Not only from the model itself, but also from Fig. 7 it is obvious that between the time series is a direct dependency. It therefore follows that if the state increases spending on education, so it will lead to increase GDP of the Czech Republic.

Fig. 6: Time series of spending on education and GDP



Source: ČSÚ, EViews 7

2.2 Dependence of crime rate on spending on education

Also in the case time series of crime rate and spending on education has been demonstrated, that both time series are non-stationary and their residues are stationary. Here also occurred the ideal case where between the time series exists cointegration regression.

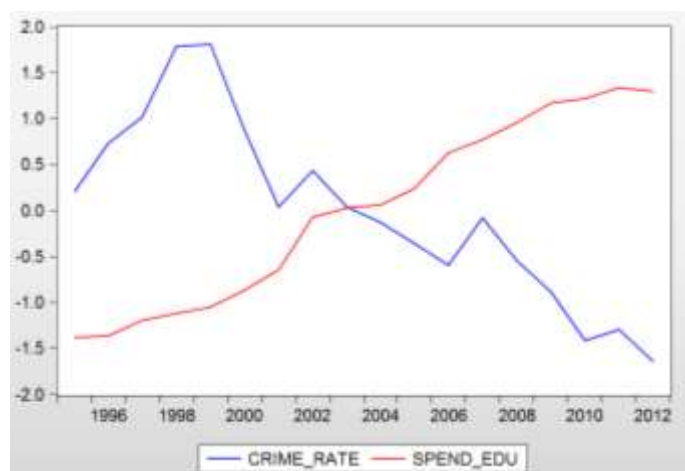
Even in this case korelogram indicates no evidence of autocorrelation, so it was possible to proceed straight to diagnostic control of model. Control results were good again – autocorrelation wasn't confirmed, the normality of the data was confirmed and conditional heteroskedasticity wasn't confirmed.

Model the relationship between crime rate and spending on education can be described as follows:

$$CRIME_RATE_t = 45,15 - 0,000077 * SPEND_EDU_t + a_t \quad (2)$$

As with the previous relation helps describe the relationship model itself and also Fig. 7. In this case between the time series is an indirect dependency. So if increase spending on education of state, this will lead to a decline in crime rate in the Czech Republic.

Fig.7: Time series of spending on education and crime rate



Source: ČSÚ, EViews 7

2.3 Dependence of life expectancy on spending on education

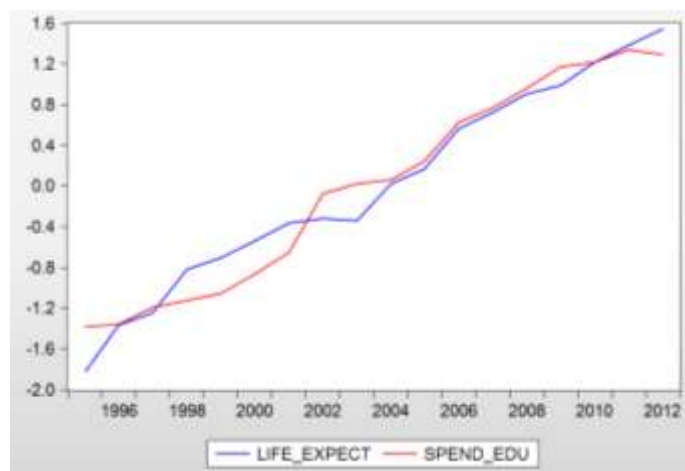
Also in the case of time series of life expectancy and spending on education were identified both time series as non-stationary and their residues as stationary. Again it is a cointegration regression. And there also korelogram wasn't demonstrated autocorrelation. Diagnostic control of model was also okay, so control demonstrates the relationship between time series.

Model the relationship between life expectancy and spending on education can be described as follows:

$$LIFE_EXPECT_t = 71,19 + 0,000034 * SPEND_EDU_t + a_t \quad (3)$$

Fig. 8 shows that between time series is a direct relationship. This means that if spending on education are increasing life expectancy are increasing as well. Life expectancy in this paper represents the health of the population in the Czech Republic.

Fig. 8: Time series of spending on education and life expectancy



Source: ČSÚ, EViews 7

Conclusion

In most EU countries have men better results than women, especially in employment. Index AAI is also different for countries of Central and Eastern Europe and for countries of Northern and Western Europe. However, the Czech Republic achieved the best results just from the area of Central and Eastern Europe. When evaluating the relationship between AAI and GDP was found that between them is linear relationship. Higher GDP creates better conditions for active and healthy aging.

In the case of human capital in the Czech Republic was confirmed model published by the OECD in 1998. There was a positive correlation of GDP, crime rate and life expectancy on spending on education. This means that even in the Czech Republic education includes among the most important factors which affect the whole czech society. In particular it is appropriate to the relationship between life expectancy and spending on education. Thanks direct relationship can be expected, that increase spending on education Czech population will increase life expectancy, which is positive from the point of view of public health. This fact will have an impact on the aging of population, which should be to reach higher ages.

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