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Impact of population ageing and elderly poverty on macroeconomic aggregates.

Eliška Orlická*

University of Economics, Prague, W. Churchill Sq. 4, 130 67 Prague 3, Czech Republic

Abstract

The paper examines the impact of population ageing on the most important macroeconomic aggregates and internal economic growth. I study elderly poverty aspect connected with demographic changes and its possible influence on saving rate, government expenditures and other variables. The main target is to examine the impact of population growth rate and elderly poverty rate changes on these variables with respect to the population ageing. I suppose, as well as Robert Sollow did, that population growth should lead to the increase in the available labour forces and successively to the growth of capital, consumption and GDP. Earlier research has demonstrated that demographic changes do influence the economy. Therefore, I suspect increasing elderly population and its socio-economic situation could in the future markedly influence economical development of ageing countries. I will use basic assumptions of Life cycle model of overlapping generation to examine above-mentioned influences of ageing and poverty.

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1. Introduction

Population explosion from the industrial revolution led to the belief that this process is going to be continuous.

* Corresponding author. Tel.: +420-603-524-077.
E-mail address: xorle00@isis.vse.cz

However, technological progress as well as political and cultural development caused fundamental changes in the society. The governments did not consider the population ageing to be a problem until few decades ago. Economists focused more on the demographic structure to notice close relation of economic growth and population composition. Continuous rise of old age dependency ratio while fertility and mortality rate drops will in the future results in decreasing active young labour force, which will due to economy complexity influence through macroeconomic aggregates economic growth itself. Scientists are unanimous in impacts population ageing could have on the economy. In the first part of the paper I describe most important influences demographic changes have on labour market, government spending and other macroeconomic aggregates. The issue of elderly poverty that is closely associated with population ageing phenomenon and it is the topic of last section of the paper.

1.1. Influence of population ageing on government spending and consumption

Consumption and savings are the building pillars of each economy. Economic lifecycle theory explains individuals' desire to smooth consumption over time to ensure stable and balanced life. The population age structure and the life expectancy ratio were found out to be crucial explanatory variables of aggregate consumption function and government spending function estimates. Stöver (2012) shows the level of consumption differs greatly between consumption purposes. Food and beverages tend to exhibit positive effect of rising share of young. The health care goods are affected positively by increasing elder share of population. Further implication of individual consumption outcomes on aggregate level proved the young and elder share of population has negative impact on consumption. The shifts in consumption structure influence aggregate demand and production in the end.

Estrada, Park and Ramayandi (2011) presented empirical paper that studied influence of population ageing on aggregate consumption in countries of developing Asia. They found out old age dependency ratio and consumption are positively correlated even though certain amount of countries show also a negative relationship. It implies Asian older population tend to reduce the consumption in national income. Authors explained the result so that Asian countries are relatively young and are not affected by population ageing as strong as European developed countries. They also mentioned the threshold, under which age does not influence consumption. Old age dependency ratio impacts could be dominated by lower consumption level and increasing saving rate of active labour force share of population.

Having regard to the current research the distribution and spending behaviour are also linked. In 1970s the House of Commons Expenditure Committee (1977) presented a research which pointed out the growing tendency of health care expenditures as well as the continuous population ageing. Burner (1992) verified the positive relationship between demographic changes and Health care expenditures on the national health care system in USA over the period 1990 to 2030. However, the research shows the population ageing represents minimal part in the annual expenditure growth rate. Small positive association between health care expenditures and age was confirmed also by Norton and Stearns (2004). They explained that increasing health care needs of older population are accumulated at the end of life and are compensated by lower health expenditures during healthy life. This conclusion led to the inclusion of life expectancy variable to later models. The predictive value of models has increased. Even though, the influence of population ageing on government expenditures increased, its share still ranges around 15 percent.

The Czech Republic has become one of the latest research areas focusing on the health care costs and the influence the demographic changes could have on their development. Ditrich and Stara (2012) verified the hypothesis that population ageing in the Czech Republic have minimal effect on the health care costs and supported the findings of previous economist. They explained the outcome by availability of technologies and their development, capital inflows or volume-based system, which were listed in the study of Fisher (2009). The financial crisis brought the focus of politicians and economists on government expenditures and also health care costs more significantly than before. The governments all over the Europe started to deal with the excessive government expenditures, which includes also issues of increasing health care costs linked with population ageing. Figure 2 shows the evolution of old social care public expenditures during period 1980-2012. Growing trend is noticeable in all presented states accompanied by increasing old dependency ratio shown in the Figure 1. It is appropriate to call 21st century as a period of medical and social reforms.

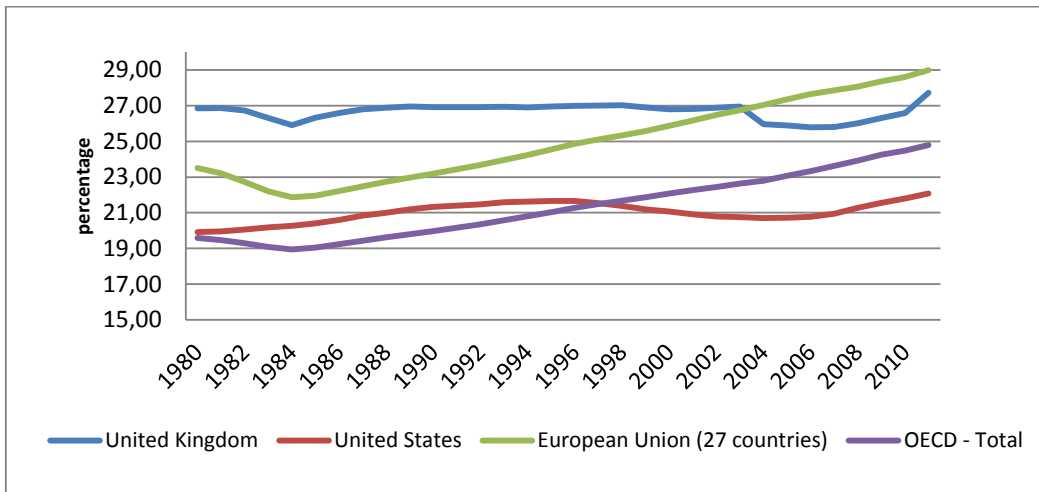


Fig. 1. Old age (65+) dependency ratio (20-64)

Source: OECD Demography and Population Database

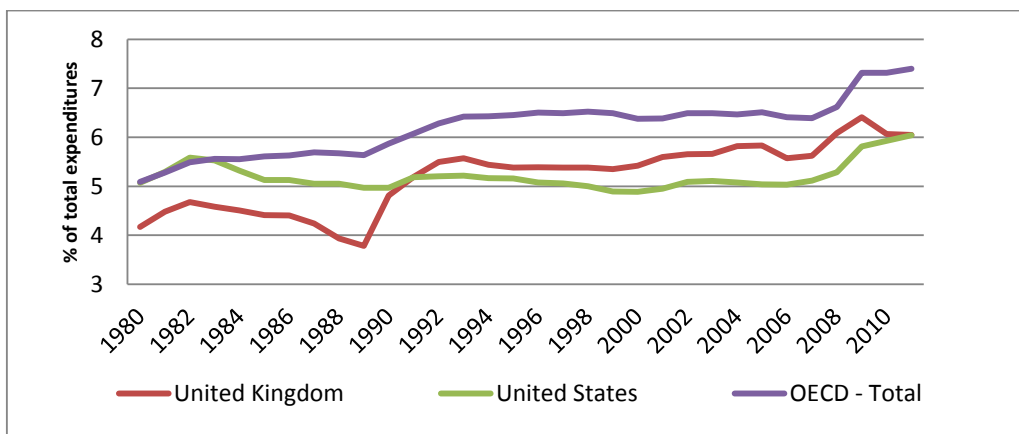


Fig. 2. Social care expenditures for population of age 65+

Source: OECD Social Protection and Well-being Database

1.2. Investments and savings

Demographic ageing changes saving behaviour of individuals and households in the long run. Longer life expectancy leads to the necessary amendments in present but first of all future consumption distribution. Internal rate of return decreases due to longer time distribution of financial resources. (Boersch-Supan – Winter, 2001) The need for private savings increases with prolonged life expectancy and growing demands for pension system. Individuals have to adapt original consumption and savings to the lower pension benefits caused by lower base of younger labour force, which funds the older generation at retirement age.

Boersch-Supan and Stahl (1991) and Boersch-Supan (2001) mentioned assumption of flat age-saving profile. Their research shows the individuals after retirement tend to lower consumption while the saving rate remains positive. They do not fail to emphasize the generosity of retirement benefits which reduce the importance of private savings for individuals. The crucial effect of pension system and the amount of pension benefits on saving rate was pointed out in the study written by Feldstein (1974). He explains negative impact on personal savings with substitution of household assets for pension benefits. On the other hand, lengthening period for retirement caused by change in preferences to remain on the labour market tends to affect personal savings positively due to investing accumulated resources.

Different saving behaviour results in changes in private portfolios' composition. Continuous population ageing and growing dependency ratio provide the pressure on private investments. The drop in labour force and rise in government expenditures lead to greater demands on the public pension benefits. The growing need for private investments will reflect through changes in capital intensity and rate of technological progress. Capital market will be flooded by new assets and grow in size. Institutional investors, such as pension and investment funds, currently play a significant role on the capital market and their importance continue to grow. This development positively affects capital efficiency and total factor productivity. (Boersch-Supan, 2001)

However, declining labour forces result in drop of capital accumulation per worker. In case the labour force change faster than the depreciation rate together with technological progress, the net investment could be negative and capital would slowly convert into consumption. (Bosworth-Bryant-Burtless, 2004)

Empirical research of relationship between investment and population age structure was presented by Higgins in 1998. The analysis show the investment has the strongest influence on the population at the age 15-24, while for example savings reach their peak between ages 30 to 45. Higgins studied, whether the level of involvement in international trade and openness of country's economy influence investment and saving rate, while considering the age structure of population. He found out the age variable have smaller significance for closed economy than for opened one. Subsequently, he expanded his research by the impact of demographic changes on states' current account balance and came to following conclusion. Demographic changes in period 1995-2010 will for USA and Canada result in surplus according to the predictions, caused by drop in national savings and investments. The older the population is, the faster investment demand fall. Average drop in investment demand is more pronounced than drop in savings, thus high income countries such as members of OECD will reach current account surplus. (Bosworth-Bryant-Burtless, 2004)

1.3. Demographic changes and labour market

Population ageing results in lesser inflow of labour force on labour market as well as in increase in average age of workforce. This phenomenon influences all members of labour market regardless they are old works or young generation. Supply side of labour market focus on decreasing quantities of young workforce and rising labour costs.

Young population wages experienced a significant shifts due to drop in young labour force supply and increased requirements for the quality of human capital on demand side. Each new generation pushes wage rate higher. Wages have tendency to grow faster for workers age 20-45 than for workers in pre-retirement age. Rationale can be found in lifecycle models, which indicate relationship of earnings and age. While young individuals tend to have lower wages, as they become more experienced their earnings grow as well. The juvenile wages can be influenced by other factors such as minimum wages regulations, form of education or restrictions on hours and type of work. Individual productivity reaches its peak for workers age 30 – 40. Productivity declines with the approaching retirement age 45-55. (Staehle 1989) Older workers are replaced by more effective workers with higher rates of productivity and human capital. The lower growth rate of wages logically follows. This assumption would also lead to drop in average labour productivity as the workforce grows older. (Johnson-Zimmerman, 1993)

The main negative impact of ageing is reflected in drop of labour forces volume, lower tax revenues needed to support wider age-retired base of population, higher expenditures for health and social care associated with older workforce and pressure on education system due to higher demands to the quality of human capital. The elderly dependency ratio is going to rise with growing demographic changes. (Serban, 2012) The side effect of population ageing causes postponement of retirement and political and economical incentives of 55-65 age groups to participate

longer in the work process. It results in higher labour supply and tougher competition among generations. On the other hand, older structure of workforce could negatively influence productivity because of the poorer health condition of older workers. (Ashenfelter 1982)

Carone (2005) describes two categories of effects. The direct effect influences the size of quality on employment, technological progress and capital-labour ratio. Amendments to the state budget deficit and, thus, to the whole economy are caused indirectly through individual economical channels.

Altered needs of new demographic structure can cause change in demand of some economic structures as well as shifts in consumption structure, such as social services and health care. (Hagemann, Nicoletti, 1989)

Investments and new technologies are a channel through which the population ageing affects demand site of labour market. Better technological innovation request more skilled, better educated workers. Older workforce has often problems with embracing new technologies which results in higher unemployment and lower productivity growth. (Kurokawa and col., 2004)

1.4. Economic growth and population ageing

Exogenous models of economic growth closely depend on changes of population size, the structure of labour force and their capital intensity. Positive shift in population size will result in unbalanced ratio between active labour force and available amount of capital. The change in decomposition influence aggregate productivity and economic growth as well. (Prettner, 2010) An overlapping generation model used for example by Miles (1999) show that ageing significantly reduce national saving rate and causes future drop in real output per capita. However, neoclassical exogenous growth model, which are able to capture impact of population ageing through adjustments of input factors or change in government expenditures, can be applied only in short- or medium- run. (Fougere, 2015)

Economists further specialized models with respect to research focus and developed semi-endogenous models. These models differ by the approach to the effect of population on economic development. Jones (1995) claims the long-run economic growth depends on population growth rather than on total population size. Prettner explains the basic idea on semi-endogenous models as follows.

„...developing a constant share of new technologies becomes more and more difficult with an expanding technological frontier. Consequently, ever more scientists have to be devoted to R&D activities in order to sustain a certain pace of technological progress. In the long run, this can only be achieved by having positive population growth.“

(Prettner, 2012, page 813)

The simulation of macroeconomic model of dynamic OLG generations was applied by Faruqee and Tamirisa (2006). They examine macroeconomic implication of population ageing and take into account policy responses to demographic ageing. The Czech Republic was chosen as an area of research due to its potential significant population ageing and used dataset include elderly population predictions up to 2050. The simulations indicate that change in demographic distribution shall reduce GDP growth by about 30 percent in the long-run. Larger share of older inhabitants will lead to drop in productivity adjusted labour supply, which will exceed the fall in active labour force. Faruqee raised the idea the additional expenditures related with ageing population shall be covered through borrowing, which will be associated with drop in saving rate in the future. They came to conclusion the negative population ageing impacts can be softened by increase in labour participation rates and technological progress. The fiscal consolidation will be needed as well as adjustment in private saving.

Prettner (2012) introduced model of endogenous technological change with finite individual planning horizons, which allows standard overlapping generation assumption but allows age-specification of individuals. Models count with individuals' fertility decisions with respect to associated costs. Prettner was able to incorporate not only population ageing but also capture the trend of decreasing fertility rate. He came to conclusion the demographic changes plays crucial role for economic development in industrialized countries. They do not have to slow down technological progress and economic growth. Decreasing birth and mortality rate can improve national economical situation under certain condition since mortality rate and fertility rate have opposite effect. Therefore, it is not

necessary to view population ageing as a disastrous scenario.

1.5. Population ageing and elderly poverty

At the beginning of 21st century, the elderly population on the edge of poverty represents 13 million people in EU25 member states. Statistic data show the growing percentage of older people affected by poverty. This number is continuously increasing together with the ageing population. Zaidy (2006) observed that risk of poverty is for population of age 65+ in EU15 countries is almost 19 %, which is twice as high as poverty risk of elderly in new EU member states. He explained poverty risk as difference between elderly income and younger population income. EU15 countries are also the countries suffering the population ageing the most and for the longest time. These countries show a 17 percent share of old population using 10, 6 percent of GDP on pension benefits. New members, on the other hand, show 3, 4 percent lower share of elderly, while using almost the same share of GDP as EU15 states.

World population ageing report from 2013 points to the fact big part of developing countries' retirees need to work to support part of consumption, which is not covered by social welfare system. On the other hand, huge part of the consumption of population of age 65+ in developed countries is dependent on government expenditures. Growing old dependency ratio in these countries will necessary result in lowering pension benefits per capital and therefore to lowering living standards. Elderly poverty could become real problem.

Cawthorne (2008) carried out a study where she focused on the impact of poverty on different population groups. She argues the social benefits significantly decreased poverty rate in USA during 1959-1974. There would be 44 percent poverty rate if the system would not be applied. Even though, 3,4 million people of age 65+ lives on the edge of poverty, it influences more markedly women part of elderly population. One of five single, divorced or widowed women reaches the poverty line and this risk increases with age.

In 2015 Cubanski, Cassillas and Damiko presented analysis of USA state level of poverty rates among people of age 65+. They used two different measures, the official poverty measure and supplementary poverty measure (SPM). The SPM includes taxes, in-kind benefits or out-of-pocket medical spending. Inclusion of these variables significantly affected the resulting poverty data resulting in much higher levels of poverty rate. Even though the official elderly poverty kept falling as the social security expenditures grew over time as we can see in Figure 3, Cubanski came to the conclusion 45 percent of elderly population in USA had twice lower incomes than the value of poverty threshold. Official measure data presented by 12 % better results.

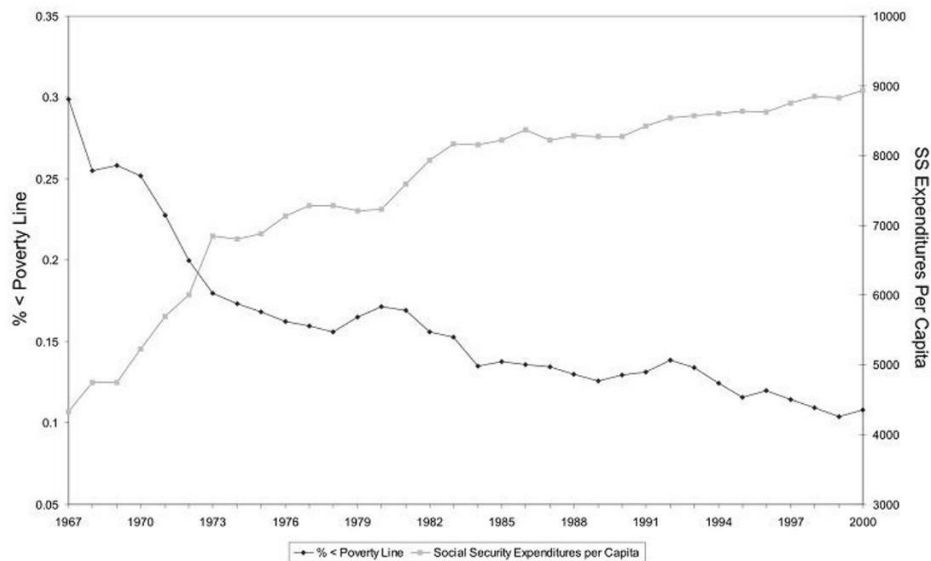


Fig. 3. Elderly Poverty and Social Security Expenditures over Time
Source: The national Bureau of Economic Research, Social Security and Elderly Poverty, 2015

Hereafter, elderly women suffers from poverty more than men of same age. Despite continuous effort of government and anti-discrimination associations, poverty rate for Black adult elders of age 65+ is twice as high as for white elders. In case of Hispanic elderly population the value is three times higher.

Two situations may occur due to increasing poor population of age 65+. Decreasing pension benefits will negatively influence the income size and lead to consumption drop of luxury and normal goods. Welfare expenditures will rise with respect to worsening economic situation and economic growth will slow down. Figure 3 also supports a conclusion that overall decrease of elderly poverty was redeemed with higher social care government expenditures. Increasing numbers of elderly population might lead to decreasing social benefits per capita and subsequently to renewed rise in elderly poverty. On the other hand, the need to keep consumption on the same level as before retirement forces pensioners to further participate on the labour market in spite of low salary level. The share of available women elderly labour force will most probably exceed elderly men labour force. The potential for additional labour force is there and could positively influence economic growth.

1.6. Conclusion

Population ageing is no longer demographic phenomenon located in the background of economic research. It has become a significant issue with serious macroeconomic consequences for whole economy. States has begun to apply socio-economic reforms to decrease burden of future social expenditures and economists carried out a considerable amount of analysis showing channels through which macroeconomic aggregates are affected. However, the question of elderly poverty and its potential increase have so far been mostly neglected. Increasing numbers of elderly population in ageing society laid before us the task of inclusion of elderly into working process. The argument of lower productivity and lesser adaptability to technological progress, especially women, could be easily negated by solution proposed by more and more young mothers - relinquish maternity leave in favour of grandparents. Working woman are due to economic circumstances or career building forced to postpone having their first child into their early thirties or to avoid having children at all. Maternity leave worsens the economic situation of whole family, despite social benefits new mothers receive, and decrease total effectiveness of young women workforce. Postponing maternity leave to grandparents could increase effectiveness of young women labour force, use knowledge and experiences of older generation and encourage the birth rate.

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