CHAPTER 23. AGEING OF POPULATION AND DEMOGRAPHIC CONSEQUENCES IN FUTURE LABOUR MARKET TRENDS[1]

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Abstract:

Ageing of population in Serbia will lead to considerable decrease in labour force in the next fifty years. Such demographic transition will cause certain economic effects. The shift in working age population structure will lead to reduced activity rates and increased dependency ratios. Furthermore, as a consequence of demographic changes, the pressure on public finances will become more intensive in years to come. Moreover, the economic development and future employment rate during the intensive ageing, would very much depend on needed structural economic changes towards the industrial production. In order to strengthen and enhance the labour force, government will have to promote life-long learning programmes and active policy measures, combining them with reforms in several vital economic sectors.

Key words: Ageing, labour force, reforms.

INTRODUCTION

Serbia, as well as the most of the Eastern European countries, is passing through a "third transition", which coincides with both political and economic transition. This demographic transition, reflected in ageing of the population, bears certain economic effects due to decrease in total population size and shift in population age distribution (Hagemann, Nicoletti, 1989). OECD economic studies have indicated that ageing is probably going to affect labour and product markets, and national saving and capital accumulation capacities. Furthermore, the expected future increase in

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old age dependency ratios will also place a considerable burden on public finances and pension systems.

In this chapter, we intend to examine ageing trends in Serbia, and to identify the potential challenges caused by nation ageing, with emphasis on the labour market implications. To begin with, we will exhibit the global and Serbian demographic indicators tendencies. Then, in the second section, we will give an overview of the labour force and activity trends in Serbia, underlying the future challenges on the labour market. In the third section, we will present the effects of population ageing on economic growth. Finally, in the last section we will define the active ageing concept and argue on possible reactivation measure of elders.

GLOBAL DEMOGRAPHIC INDICATORS AND TENDENTIONS

Ever since the beginning of the 20th century there has been the most intense growth of the world's population. For 110 years the world's population increased by 5.3 billion (from 1.6 in the year 1900 to 6.9 in the year 2011). The youngest countries in the world are African countries like Niger, Uganda and Mali where around 48% of the inhabitants is younger than 15 years, while the oldest are Japan, Germany and Italy where 21% of inhabitants is older than 65. In this piece of information it is very important to know that the life span in underdeveloped countries is far shorter than in countries such as Japan or the countries of the Western Europe. The ageing process is affected by low fertility rate. Ageing is a process that implies an increasing proportion of elderly population and a decreasing proportion of the young population. There are 2 types of population ageing: ageing from below (caused by low birth-rate and decreased share of the youth in general) and ageing from above (increase of elderly population share). From the factors that help the ageing process of the population there are the increase of the life span, which increases the rate of elderly population.

Poverty became a serious global issue, particularly because the highest growth of population is occurring in the poorest countries. In the Democratic Republic of Congo, 8 out of 10 inhabitants live with less than 2 USD per day. In India, 76% of the population lives below that level, which is more than 900 million people. Relatively high rates of population growth make the goal of decreasing the poverty elusive.

The world's population increased from 3 billion in the year 1959 to 7 billion in the year 2012, which shows that the world's population increased by more than two times in the period of less than half a century. The latest predictions are that the population rate will grow, but slower, during the 21st century. Predictions are that

the rate of inhabitants will increase by 50% by the year 2044, compared to the year 2000.

Figure 1: The world population and the predictions
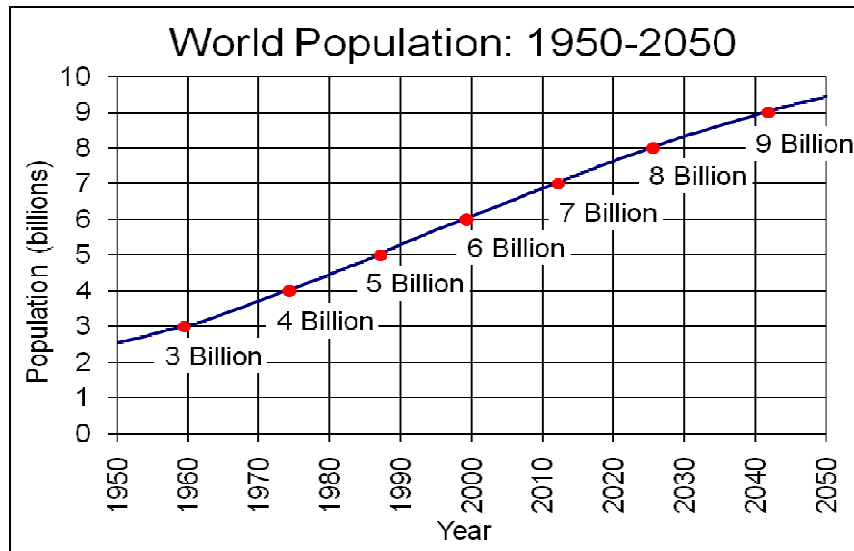
Source: U.S. Census Bureau, International Data Base, June 2011 Update

The population growth rate of the world increased from 1.5% per year in the 1950s to its peak of about 2.2% in the 1960s because of the decrease of the mortality rate. The growth rate started decreasing after that, which was caused by increasing the age of people who join in marriage and by the increase of availability of using efficient contraceptive methods. The changes in the population growth weren't always as predictable. For example, there was a significant decrease of population growth in China in the 1950s because of the efficient birth control policy and there were numerous natural disasters and the fall of agricultural production in the period of the great social reorganization, which caused the mortality rate to suddenly grow and the fertility rate was cut in half. A steady fall of the parameter is predicted, so that in the year 2050 the population growth rate will still be positive, but on the level of about 0.5%.

Figure 2: Global rates of the population growth in the period between the year 1950 and the year 2000 (evaluation)
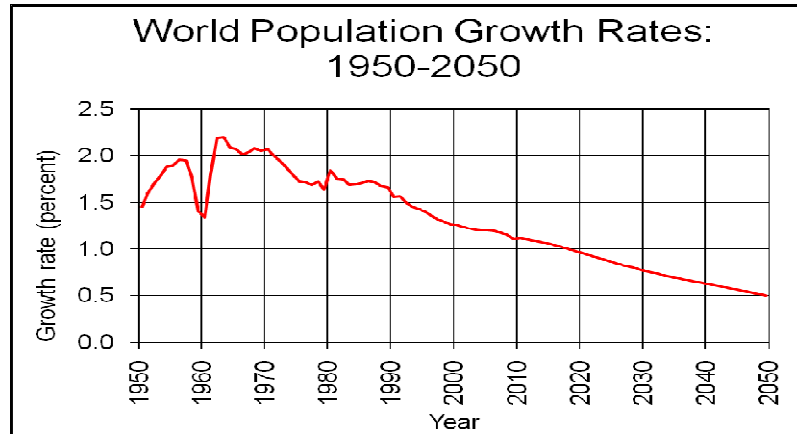
Source: U.S. Census Bureau, International Data Base, June 2011 Update

Apart from the growth rate, another way of perceiving the population is considering the year changes in the total population. The annual growth in the world's population reached its peak of about 87 million by the end of the 1980s. The largest leap occured during the 1960s, when the annual growth of the population increased every year by 70 million. It is predicted that by the year 2050 this parameter will be in a constant fall and that in the 2040s it will be on the same level as it was in the 1960s.

Figure 3: The average annual changes in the population
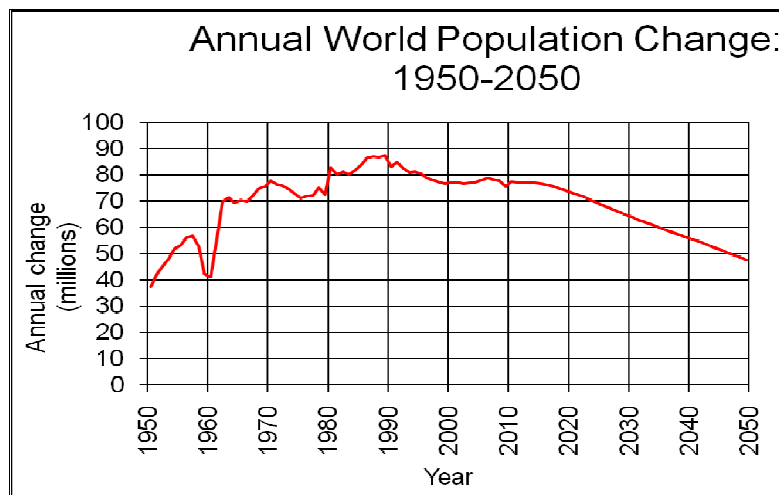
Source: U.S. Census Bureau, International Data Base, June 2011 Update

Case of Serbia

When the first results of the population census are taken in consideration, it is clear that Serbia has a negative population growth. With the population census of the year 2002 it was determined that Serbia had approximatelly 7.5 million inhabitants while that number dropped by 380 000 people in the year 2011, meaning that Serbia has now around 7.12 million inhabitants. From the 5 major regions, only the munipacy of Belgrade increased the number of inhabitants, where opposed to the year 2002, the number increased by 62 997. The largest decline of about 11.5% was noted in the South and East region of Serbia where the number of inhabitants was reduced by 201 736.

Population intake of people younger than 15 years of age declined from 16.1%, as high as it was noted in the year 2002, to 15.2% in the year 2009, while the intake of the elderly population (older than 65) increased from 16.6% to 17.1%. During the same period, the average age of the inhabitants increased from 40 to 41 year of age. The allarming trend of rapid population ageing is affected not only by the low birthrate and negative population growth, but also by the movement of the age boundary when most woman have their first child from the age of 25 in the year 2001 to 27 in the year 2011. To all of this it should also be added that young and educated people emmigrate.

The number of citizens of the Republic of Serbia that is on temporary work visas abroad is around 420 000, and a number of around 40 000 people with higher education has left Serbia from the year 1990, which puts us to a catastrophic second place by brain drain in the world.

The number of the new-born on 1000 inhabitants is 9, while the number of deceased is 14, meaning Serbia has a negative population growth of -0.5. The intake of inhabitants younger than 15 years of age is 15%, while the elderly population takes up about 17% of the population of Serbia, which puts us in the middle aged countries of Europe. The predictions show that Serbia will have 6.8 million inhabitants by the year 2025 and 5.9 million by the year 2050, meaning that the country will lose about a fifth of its current population. Also, the predictions for the age pyramid of the year 2032 show that the elderly population (older than 75) will have the largest share in the population of Serbia, a lesser share will go to the inhabitants between 45 and 64 years, meaning the age pyramid will not have the actual shape of a pyramid, but the one of the letter T.

Table 1: Number of pensioners in Serbia in 2011, according to type of pension

	Old age		Disabled		Family		Total	Old age/ other pensioners
	Number	%	Number	%	Number	%	Number	
Workpeople	719,387	0.53	318,007	0.24	313,949	0.23	1,351,343	1.14
Self-employ-ment	28,112	0.47	16,936	0.28	15,080	0.25	60,128	0.88
Farmers	181,423	0.82	13,466	0.06	25,348	0.12	220,237	4.67
Total	928,922	0.57	348,409	0.21	354,377	0.22	1,631,708	1.32

Source: PIO fund, www.pio.rs

The expected life span of men in Serbia is 71.6 years, while the women's is 76.4 years. The fertility rate dropped from 1.6, as high as it was in the year 2001, to 1.4 per woman in the year 2010. If we are aware of the fact that fertility rate of 2.1 provides the simple restoration of the population, higher than 2.1 provides population growth and lower than 2.1 provides the reduction of the population, it means that the primary goal of Strategies to encourage birth is not being fulfilled and that is a stationary population – population in which the next generations will be just as large-scaled as the previous ones.

Figure 4: Age-gender pyramid of Serbia, 2007
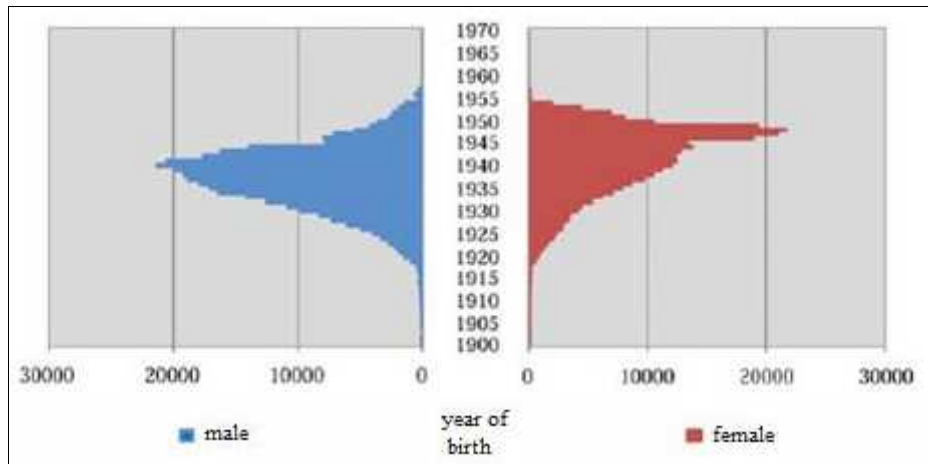
Source: www.stat.gov.rs/

Regarding the current situation and the number of retired people, it is noted that the pyramid is steadily expanding to its middle part and that it reaches its full width with the population between 48 and 56 years of age, in which each category is more numerous than 110 000 people, meaning in generations born between 1948/1949

and 1956/1957. According to the population census of 2002, the population between 48 and 56 years of age was 1 087 139 or 14.49% percent of the total population.

Considering the fact that the world population is currently in a demographic transition – a transformation of the population characterized by large families and short life span to the population of small families and prolonged life span, the ageing of the population will be a highlighted characteristic of this century, with the higher share of elderly people in the growing total number of Earth's inhabitants.

WORKING AGE POPULATION AND ACTIVITY TRENDS

Analysing the average population age in Serbia for the last sixty years, we can conclude that the Serbs are getting older at a fast pace. During the last six decades, average population age went from 29 to 41. Observing the figure below, one could easily notice that the increase in average population age is accelerating especially from 1990 to 2010.

Figure 5: Average age of the population in the period 1950-2010
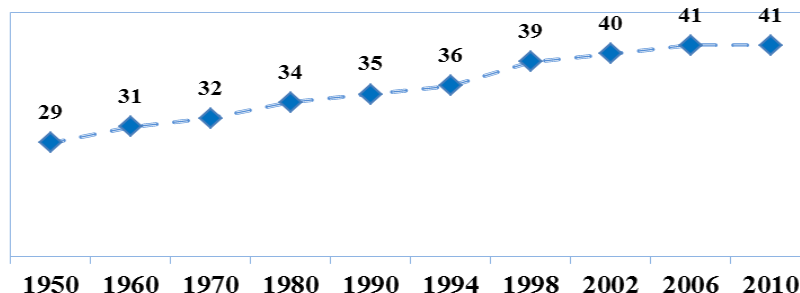
Source: Domazet, I., Filimonovic, D. (2012) Working Potential of Elders in Serbia and Proposal of Reactivity Model, New Challenges in Changing Labour Markets, Institute of Economic Sciences, Belgrade, page 141

Demographic ageing, as a general characteristic of Serbian society, is also noticeable within the active part of the population. The share of working age population (15-64) is 67.6% of total population in 2010. which is less than in every new EU member state and yet above than EU-15 average.[4] Table below shows the future changes in population age composition, according to national statistical office.

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[4] Statistical Office of the Republic of Serbia (2011) *Projections of Labor Force in Republic of Serbia, 2010-2050*, Belgrade, page 9.

Table 2: Projections of the population age indicators*, 2010-2050*

Republic of Serbia	Medium fertility version			High fertility version			Low fertility version		
	2010	2050	Change	2010	2050	Change	2010	2050	Change
Total population (in thousands)	7428	6591	-837	7447	7168	-279	7394	5732	-1662
Young (15-24) (Total population %)	12.1	11.2	-0.9	12.1	12.2	0.1	12.2	8.9	-3.3
Old (65 and over) (Total population %)	16.9	23.2	6.3	16.8	21.3	4.5	16.9	26.7	9.8
Working age population (15-64) (Total population %)	67.6	61.1	-6.5	67.5	59.9	-7.6	67.9	62.4	-5.5
Rate of demographic dependency of older population (65+/15-64)*100	24.9	37.9	13	24.9	35.6	10.7	24.9	42.7	17.8
Rate of aging workers as the percent of the working population ((55-64)/(15-64))*100	20.9	21.6	0.7	20.9	20.3	-0.6	20.9	24.3	3.5
Particularly old as a percent of the old (80+/65+)*100	22.3	26.4	4.0	22.3	26.4	4.0	22.3	26.4	4.0

Source: Statistical Office of Serbia (2011), Workforce projection in the Republic of Serbia, 2010-2050.

On one hand, based on medium fertility rate, the percentage of youth (15-24 years) in total population will decrease from 12.1 to 11.2 during the next fifty years. On the other, all projection options predict significant increase in share of elders (65 +). According to medium fertility rate, their portion will raise from 16.9 in 2010 to 23.2 in 2050. Furthermore, the population projections envisage the decrease in working age population as well, from 5.5 to 7.6 percent, depending on the used fertility rate. In addition, due to predicted increase of the elderly population, the raise of the elders' dependency ratio is also expected in the next five decades.

Starting point for the labour force projections, made by Statistical Office of the Republic of Serbia, were activity rates for different age groups. Firstly, constant activity rates assume that there will be no change in activity through the whole period observed. Secondly, the increasing activity rates assume the convergence of national activity rates with those expected in the ten new EU member states (until 2030.).

Table 3: Projected working population activity rates, 2010-2050

2010-2050	2010	2020	2030	2040	2050	Change 2010-2050
Constant activity rates (15-64)	61.9	62.4	61.9	61.1	61.3	-0.6
Increasing activity rates (15-64)	61.9	71.1	73.9	72.8	72.7	10.8

Source: Statistical Office of the Republic of Serbia (2011) Projections of Labour Force in Republic of Serbia, 2010-2050

The first projected activity scenario is unlikely to realize, given the already very low activity rate, therefore probably unlikely to drop even more. The second, optimistic variant, is predicting significant increase in activity through modified convergence with EU structures. Goals set by Europe 2020 strategy are not strict directives for membership in EU, yet the compliance with the objectives may reflect on the attitude towards candidate states in integration process. In other words, it means that EU candidates are encouraged to develop programmes and policies that will enable them to "catch up" with EU indicators.

Table 4: Employment rates in EU and Serbia, in 2010 and 2020

Objectives	EU		Serbia		Difference	
	2010	2020	2010	2020	2010	2020
Employment rate 15-64	66	73	48	65	-18	-8
Employment rate 20-64	68	75	49	66	-19	-9

Source: Arandarenko, M., Vujic, V. (2010) Employment projections and trends on Serbian labor market until 2020, Kvartalni monitor No. 21

Serbia will have to pass very difficult and ambitious task in next decades in order to reach the convergence with EU. Potentially, one of the most significant obstacles on Serbian EU path could be the present disparity between present employment rates in Serbia and those in EU, reaching 18 percentage points in 2010.

Future Challenges on the Labour Market

Demographic transition caused by ageing of the population bear certain economic consequences. Radivojevic and Nikitovic (2010) pointed out two main effects of ageing. The first effect will be reduction in working age population and the second one will be the structural change in working age population composition in favour of

older workers.[5] Moreover, the shift in working population structure will result in decreasing the overall activity rate within the working contingent. In these conditions, the sustainability of current activity rates would depend on new institutional and active age policies. Future tendencies of the old age dependency ratio, which suggest the potential quotient between active population and pensioners, could be useful for the pension system reform. Radivojevic and Nikitovic projected the raise of old age dependency ratio from 28.3% (in 2005) to 56.4 % (in 2050), with 90% confidence interval.

Important aspect of enhancing the conditions on the labour market will be the implementation of new economic growth model. According to Arandarenko and Vujic (2010) quantitative lift of the overall employment is as vital as the future change in sectorial employment structure. They pointed out the oversized employment in agriculture and too small in industrial production, compared to countries with similar economic activity. Transition to the new growth model underlines the revitalization of industrial employment. Figures below indicate projected employment rate in three main sectors as a percent of total employment for 2020.

Figure 6: Employment structure by economic sectors, 2010 and 2020

Source: Arandarenko, M., Vujic, V. (2010) Projekcije zaposlenosti i kretanja na tržištu rada Srbije do 2020. godine, Kvartalni monitor No. 21, page 80

Arandarenko and Vujic (2010) also pointed out the Educational challenge in context of ageing, concerning the needed reforms of educational system. The ongoing declination of youth activity level (15-19) may be expected to continue in the future because of their further and longer education.[6] Replacement of bigger and less

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[5] Radivojevic B., Nikitovic V. (2010) *Održivost radne snage u uslovima intenzivnog demografskog starenja*, Zbornik Matice srpske za drustvene nauke, Novi Sad, page 461
[6] Radivojevic, B., Nikitovic, V. (2010) page 459

educated cohorts with smaller and better educated ones may lead to apparent improvement in human capital indicators.[7] For example, the increase in share of high-educated people in population aged 25-54 years. However, fundamental quality and optimal utilization of human capital could only be achieved with a thoroughly reforms in Serbian education sector.

As a consequence of ageing population, the pressure on the pension system sustainability will become more intensive in the coming years. In more developed countries only 0.5-4.5 % of the budget income is used for pension funds grants, while in Serbia it was 49.3% in 2011.[8] The next section of the chapter will try to discover the relation between economic growth and ageing.

ECONOMIC GROWTH VS AGEING

In academic literature there is a stance that changes in population age structure may exert a significant influence on economic growth (Bloom, Canning and Fink, 2011). If age-specific behaviour with respect to labour supply and savings were fixed, labour supply and savings per capita would tend to decline with a rising elderly share of the population. Keeping all other factors such as productivity and migration equal, this would imply lower growth in income per capita. The model in previously mentioned paper[9] compares demographic shifts that happened between 1960 and 2005 to projected changes between 2005 and 2050, and investigate how economic growth would look like under future demographic change scenario. They calculated total labour force participation rate (LFPR), as the number of men and women active in the labour force, divided by the total population aged 15 and older. Results show that LFPR will decline in 126 countries analysed, and it is three quarters of all countries in the world. They decomposed total actual growth between 1960 and 2005 into growth in GDP per worker and growth in LFTP (Labour force to population). Income per capita in any given period is defined as total GDP divided by population (P), which implies that GDP per worker (W) is equal to income per capita divided by the number of workers per capita:

$$\frac{GDP}{W} = \frac{GDP/P}{W/P} = \frac{GDP/P}{LFTP}$$

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[7] Arandarenko, M., Vujic, V. (2010) *Projekcije zaposlenosti i kretanja na tržištu rada Srbije do 2020. godine*, Kvartalni monitor No. 21, page 81

[8] Institute of Economic Sciences (2012) Ageing and Reactivation of Elders, Macroeconomic Analyses and Prognoses, No. 1-2, Belgrade, page 96
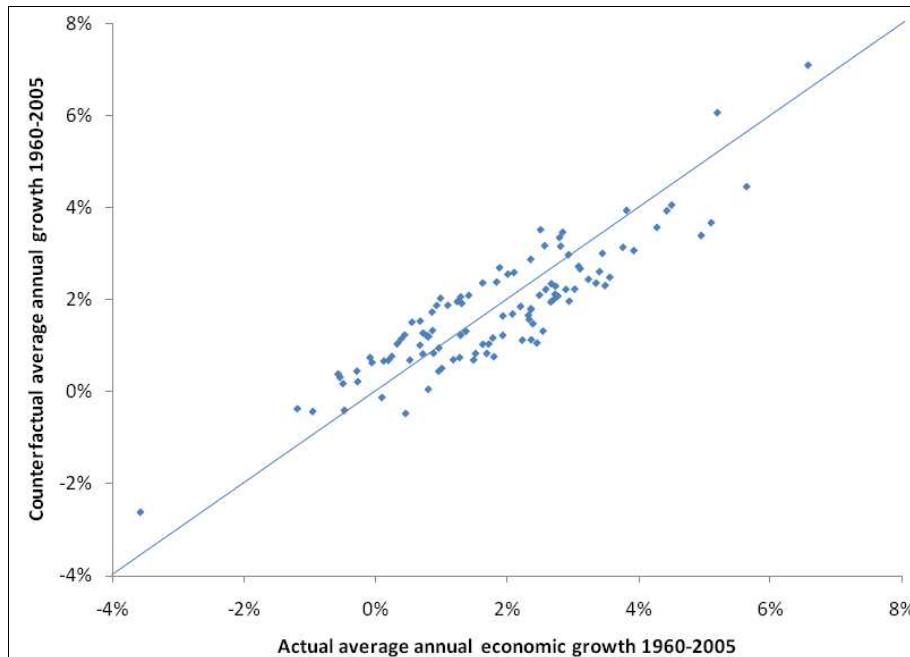
[9] "Implications of Population Aging for Economic Growth", David E. Bloom, David Canning, and Günther Fink, PGDA Harvard, January 2011

and after taking logs and simplifying:

$$g_{t,t+1} = \ln\left(\frac{GDP_{t+1}/W_{t+1}}{GDP_t/W_t}\right) + \ln\left(\frac{LFTP_{t+1}}{LFTP_1}\right)$$

Although the average actual growth rate was 1.84 percent per year over the period, our calculations imply that growth rates would have been 1.75 percent per year under the counterfactual assumption of the less favourable demographic environment anticipated for the period 2005 to 2050.

Figure 7: Actual and Counterfactual Annual Growth Rates of Income per Capita, 1960-2005 (counterfactual assumes 2005-2050 growth rate of labour force per capita)

Source: "Implications of Population Aging for Economic Growth", David E. Bloom, David Canning, and Günther Fink, PGDA Harvard, January 2011

In total of 58 countries would have grown more slowly under the counterfactual 2005-2050 demographic scenario. The two countries or areas with the largest difference between actual and counterfactual growth are Singapore and Hong Kong, with actual average annual growth rates close to 5 percent per year, and counterfactual growth rates of 3.4 and 3.7 percent per year, respectively.

Result is that population aging in the developed countries is likely to have a large effect, reducing income per capita primarily through the fall in labour supply per capita that will accompany the reduction in the share of working-age population.

ACTIVE AGEING CONCEPT AND ELDERS REACTIVATION

Older society members are valuable, often neglected and insufficiently used resource, which must be taken into account by policy makers in order to establish fertile ground for sustainable economic growth in future. The word active does not only mean the physical activity, it represents continuous participation of elders in social, economic and cultural life of a community. Finding solutions that will encourage people to remain active and thus contribute to development of their nation will remain a challenging task during the process of demographic transition. Active ageing concept promotes ideas on longer working life and later retirement. It also encourages and supports older people to volunteer and to lead independent and healthy life. Therefore, comprehensive active policy should comprise:[10]

−   Financial and legal impediments for discouraging early retirement;
−   Rewarding stimulations for acquiring new knowledge and skills in order to avoid the incompetence of elders;
−   Working standards and conditions suitable for the oldest employees;
−   Preventive measures that will act to preserve the health of older people.

Zaidi (2008) identified five sectors of public regulation that would have to be the subjects of reforms, thus creating conditions for active ageing of a society. Those areas are:[11]

1.   Pension system;
2.   Health-care system;
3.   Employment policy;
4.   Migration and policy of inclusion;
5.   Infrastructural development.

Essential for the implementation of the active ageing concept is the existence of effective social dialogue. Exchange of the information and sharing in the experience on the international level is another important aspect in successful active measures implementation.

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[10] European Commission (2011) *Employment and Social Developments in Europe 2011*, page 204
[11] Zaidi, A. (2008) *Features and Challenges of Population Ageing, European Centre*, Vienna, page 9

Pensioners Cooperatives as a Reactivation Model

Domazet and Filimonovic (2012) have proposed new and innovative model for reactivation of pensioners, based on the pensioners' cooperatives. Such proposition is originated from already present type of cooperatives in Serbia – the youth cooperatives. The target group for such reactivation could be elders aged 55-66 years (near 330.000 pensioners) entitled to old-age pensions.[12] Pensioners, who are capable and willing to work on part-time basis, could join the cooperatives that will relate them to potential employers. Assuming that the model is successfully implemented, government could benefit from additional budget revenues through tax and contribution collections. Moreover, pensioners would benefit with the increase of their income, becoming more independent of government decisions on their pension amounts.

Figure 8: The distribution of old-age pension beneficiaries by age groups, 31.12.2010
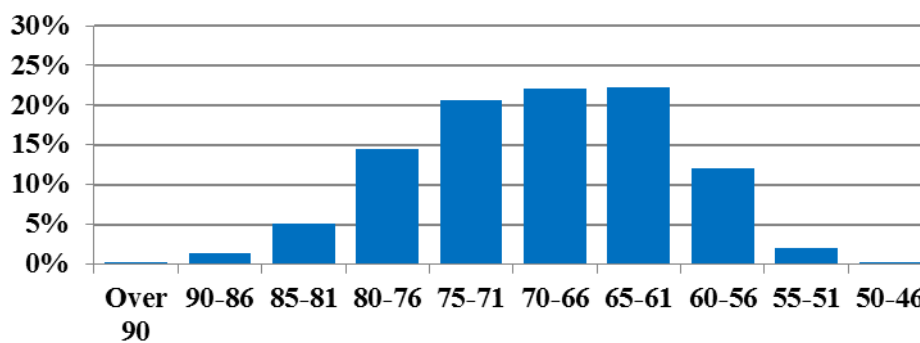
Source: Statistical Office of the Republic of Serbia, 2010.

Working potential of elders is identified by analysing their education level and professional expertise. The mentioned research has resulted in discovering the wide range of potential skills that could be anticipated as unexploited labour potential. The overall percentages regarding the education of Serbian older population are not so encouraging. However, observing reactivation target age group (55-66) we can notice that there are 40% of elders with high school education and nearly 20 % with higher education.[13] These results reveal a satisfactory knowledge and skill resource that may become effective by implementing suitable reactivation model.

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[12] Domazet, I., Filimonovic, D. (2012) *Working Potential of Elders in Serbia and Proposal of Reactivity Model*, in ed. Zubovic and Domazet: New Challenges in Changing Labor Markets, Institute of Economic Sciences, Belgrade, page 148
[13] Domazet, I., Filimonovic, D. (2012) page 145

Furthermore, Domazet and Filimonovic presented the profession structure of elderly population in Serbia.

Table 5: Professions of elders*, in 2006*

Occupation	Age group		
	55-64	65-74	75 & over
Managers	4.3%	0.0%	0.0%
Professionals	15.0%	2.5%	0.0%
Technicians	11.0%	1.0%	0.0%
Clerks	13.0%	1.0%	7.0%
Utility workers and traders	14.0%	4.0%	0.0%
Workers in agriculture, fishing industry and forestry	14.0%	77.0%	71.0%
Craftsmen	13.0%	9.0%	0.0%
Machine operators	7.0%	0.0%	3.0%
Simple occupations	8.0%	3.0%	4.0%
Military personnel	0.0%	0.0%	0.0%

Source: Domazet, I., Filimonovic, D. (2012) Working Potential of Elders in Serbia and Proposal of Reactivity Model, in ed. Zubovic and Domazet: New Challenges in Changing Labor Markets, Institute of Economic Sciences, Belgrade, page 146

Cooperative members could perform a wide range of activities, having in mind their profession diversity. Those activities may stretch from various physical demanding jobs, coaching in machine operating, passing knowledge on old craftworks to youth, etc. Domazet and Filimonovic stressed several key types of profession within target age group:[14]
– Experts in certain area (15%);
– Craftsmen (13%);
– Machine operators (7%);
– Technicians (11%);
– Managers (4.3%).

At the moment, there are no legal prerequisites to implement this model in practice. The existing Law on Cooperatives does not provide the possibility for the existence of pensioners' cooperatives. The new Law on Cooperatives should abolish the age limit for the members of cooperatives in the future. This model represents a unique proposal for the reactivation of the older population, which is socially more acceptable than the extension of the age limit for retirement, while, it represents

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[14] Domazet, I., Filimonovic, D. (2012) page 149

the new income source for the personal budgets of pensioners in contrast to the model of volunteering.

CONCLUSION

Serbia is facing with severe demographic changes. Drastic reduction in population numbers, rapid ageing caused by low fertility rates and second highest brain drain in the world, impose the necessity of urgent policy actions. Moreover, negative working age population projections represent a significant threat to sustainable economic development. In order to ensure economic and social prosperity, Serbia would have to solve a whole list of reform tasks in order to successfully grapple with ageing, involving reforms in a number of different economic sectors, such as education, labour market, pension and health care system. If we do not approach these challenges in efficient and responsible manner, economic growth will be limited and we would not have sufficient resources to finance pensions, healthcare and education systems in the future.

Quantitative increase in working age population will require reforms in pension system, labour legislation, healthcare protection and migration issues. The rise of retirement age limit is an important policy measure in terms of pension system reforms. Direction of reforms in certain EU member states is based on two key determinants, increasing the retirement age (with equalization of age retirement limit for both genders) and a tendency to harmonize the age limit with life-span expectancy. Regarding the labour legislation reform, important incentive would be in improving ability of all age groups to preform flexible, part-time jobs. Moreover, improvements in health care system will lead to better health care status of the population, resulting in longer working life, thus creating greater labour force supply.

Increase in productivity, as another vital challenge under ageing conditions, requires the promotion of lifelong learning and active ageing concepts, as well as the implementation of differently based economic growth model. The ability to acquire new skills parallel to development of the economy will become more important as the world is becoming more complex and dynamic place in economic terms. Good educational system is the solid basis on which workers can continue to build their professional expertise, becoming more competitive (and for a longer period of time) in the labour market. The mentioned shift towards the new economic growth model requires the revitalization of industrial production and the modernisation of production process, which are in a close connection with the education quality of the population.

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