PENSION REFORM AND THE LONG-TERM LABOUR FORCE PROJECTIONS IN SERBIA: THE A.P.P.LICATION OF THE COHORT-SIMULATION MODEL

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ABSTRACT

In 2014 the Government of Serbia has adopted a law that postponed both the minimum age for early retirement for men and women and the minimum age for old-age retirement for women. The measures were introduced in order to address high inactivity of the elderly, especially among women, while, at the same time, addressing the problem of the increasingly aging population and heavily burdened pension system. We use the Cohort Simulation Model and the Labour Force Survey data to investigate the medium- and long-term effects of the retirement reform on the projected activity rate of men and women in Serbia,. The results indicate that the activity rate of older workers would increase by 1.9 percentage points by 2026 and by 3.9 percentage points by 2060 even without the introduction of the pension reform, merely as the result in the activity trends. On the other hand, the introduction of the pension reform increases the activity rate by additional 2.2 percentage points in 2026 and by 2.9 percentage points in 2060. Additionally, the results suggest that the large gender gap in the activity rates will be significantly reduced. However, the growth of the activity rate suggests that the Europe 2020 target of 75% 20-64 activity rate will be reached in Serbia only in 2060.
Key words: labour market activity, pension reform, projection, Serbia
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INTRODUCTION

Serbia's labour market is characterized by low activity, especially since the onset of the 2008 economic crisis (Arandarenko et all, 2012). The activity rate for

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the age group 15 - 64 in Serbia in 2017 stood at 66.7% (SORS, 2018), while on average the activity rate for the same age group in the EU was at 73.6% (OECD, 2017). The effects of the inactivity are similar to those of the unemployment: besides the financial ones, long-term absence from the labour market lowers the skills of the workers, and consequently their chances for future employment. In addition to the effects on the individual socio-economic position, low activity represents great untapped potential for the Serbian economy, as well as for every other country (Arandarenko et all, 2012). Having this in mind, the European Commission had, in the Europe 2020 strategy for sustainable growth and employment, set the goal of increasing employment rate of the population aged 20-64 to at least 75%.

The inactivity rate in Serbia is particularly high among the elderly (55-64) - 51.0% in 2017 (SORS, 2018), compared to the 39.3% in 2017 in the EU (Eurostat, 2018). As in many other transition countries, high inactivity in this age group is partially due to the process of privatisation and reconstruction which destroyed many jobs in the last two decades, while at the same time, they were facing demands of a rapidly changing technological and work environment (Žarković-Rakić & Vladisavljević, 2014). Given their tough position on the labour market, many elderly workers decided to remain inactive and wait for retirement, rather than to face the process of job search. Within this age group inactivity is particularly high for elderly women (61.5 % vs. 40.8 % for men in 2017). Lower activity rates of elderly women are partially due to differences in gender roles, which put higher pressure on women to perform unpaid home labour (Avlijaš et all, 2013), but also due to differences in the retirement system, which sets a different age of retirement for women and men (World Bank, 2016).

On the other hand, Serbia is also a country with an ageing (and shrinking) population, which coupled with the low activity presents a challenge to the social protection system, especially the pension system. In 2014, 13% of GDP was spent on pensions, which was one of the highest shares in Europe, while the ratio of pensioners to workers stands at 1.2 since 2012 (PIF, 2018). Numerous studies have indicated that the spending was not sustainable, and that there was a need to encourage active aging in order to extend the service life of the elderly population (e.g. World Bank, 2009; Fiscal Council, 2012).

The reform of the pension system has been suggested as one of the measures to tackle lower activity of the elderly, and particularly older women in Serbia, while, at the same time addressing the problem of the increasingly aging population and heavily burdened pension system. Unanimous conclusion of the number of studies dealing with the issue of the inactivity of older workers is that it is necessary to postpone the age at which people are allowed to go to early retirement (e.g. Aranderenko et all, 2012; Žarković-Rakić and Vladisavljević, 2014). At the same time, similarly to many other countries, it has been suggested that the retirement age for men and women should be equalized (Fiscal Council, 2012),

In 2014 the government of Serbia has adopted a law that postponed both the minimum age for early retirement for men and women (2015 – 2023) and the

minimum age for old-age retirement for women (2015 – 2032), having in mind the existing gender gap in the retirement age.

In this paper we investigate, ex ante, the medium- and long-term effects of the retirement reform on the projected activity rate of men and women in Serbia. We project the values of activity rates by using the Cohort Simulation Model – CSM (Burniaux et al, 2003; Carone, 2005) together with the Labour Force Survey data from 2008 to 2016. In order to measure the effects of the retirement reform, we compare the results of the activity rate projections without and with the reform of the pension system.

This paper is structured as followed. After this introduction, in the next chapter we are describing, in detail, the retirement system in Serbia and the reform that has been introduced by the government. In the section 3 we present the methodology, including the Cohort Simulation Model, while in section 4 we present the results of the simulation. Section 5 concludes.

THE REFORM OF THE PENSION SYSTEM

The Serbian pension system

The Serbian pension system is a Pay as You Go system and it is regulated by the Law on Pension and Disability Insurance which was adopted in 2003 and amended last time in 2014. The pension system consists of one pension fund which covers all employees, self-employed persons and farmers and is administered by the Republic Fund for Pension and Disability Insurance. There are three different pension schemes in Serbia and these are old age retirement scheme with early retirement options, disability pension and survivor pension. In 2014, 57.8% of pensioners had an old-age pension, 20.0% had a disability pension and the remaining 22.2% had a survivor pension (PIF, 2018).

Old age retirement scheme

Prior to the 2014 reform, the old age retirement scheme set the minimum retirement age at 65 for men and 60 for women while the minimum contributory years were set at 15. Early retirement for men was possible at the age of 60 years and 40 years of contributions and for women at the age of 54 years and 36 years of contributions. The amount of the pension benefit is calculated based on a point system so that personal points are multiplied with a general point value. The general point value is set by the government and announced by the Republic Fund for Pension and Disability Insurance. The personal number of points is determined as the product of the average personal coefficient and total insurance period.

The average personal coefficient is the sum of average annual personal coefficients divided by the respective period for which value points are taken into account (only earning history after 1970, which may be shorter than the total contribution period). The annual personal coefficient is calculated by taking the gross or net earnings of the person concerned in each calendar year divided by the

national average gross or net annual earning of all employed persons in the same year. In other words, the annual personal coefficient puts the earnings of the person in relationship to the average earning and when they are, for instance equal, the coefficient equals one, when the earnings of the individual are double of the average earnings in a year, it's equal to two, etc. There are penalties for early retirement which amount to 0.34% of reduction for each month of anticipation below the statutory retirement age and the reduction is capped at 20.40%.

Disability pension scheme

There is no minimum retirement age in the case of disability pension. The disabled person retires when the disability is officially confirmed. Minimum qualifying period if disability is not work related is 5 years of insurance for persons above the age of 30. Insured persons aged below 30 years are entitled under more favourable conditions. (Up to 20 years: at least 1 year of insurance; up to 25 years: at least 2 years of insurance; up to 30 years: at least 3 years). The same method of calculation as for the old age pension is used for the disability pension scheme, however, the number of contributory years needs to be calculated based on whether the injury was work related or not. For work-related injuries the contributory years are set to 40, whereas for not work related disability the calculation is somewhat more complicated and less contributory years are generally used. (The total qualifying period for calculation of disability pension for persons whose disability is not related to work comprises of: actually completed insurance period and additional hypothetical period. Additional hypothetical period is determined as 2/3 of the period starting with the age of the person concerned on the date of contingency up to the fictive age of 53, plus 1/3 of the hypothetical period from the fictive age of 53 to the fictive age 58 (2.5 years) for women and 60 for men (3.5 years)).

Survivor pension scheme

The survivor pension scheme constitutes the right to receive the pension of the deceased person for his or her eligible survivors. Eligible survivors are widow/widower, children and parents. Survivors' pension is defined according to the number of eligible family members (including the spouse). The pension is based upon the general invalidity or old-age pension the deceased would have been entitled to at the time of death. The survivors' pension is calculated as a percentage of the pension to which the deceased would have been entitled, according to the number of eligible survivors (One survivor: 70%, two survivors: 80%, three survivors: 90%, four or more survivors: 100%) and it amounts to at least 70% of the old-age pension of the deceased.

The reform of the pension system

In 2012 - 2014 the public pension expenditure reached 13% of GDP and this constituted an increase of 2.1 percentage points compared to the period 2005 - 2007 prior to the economic crisis (World Bank, 2015). Responding to the high share of the pension expenditure in the GDP, the Government of Serbia has in 2014 introduced a pension reform, which main goal was to reduce the pension expenditure to 11% of GDP. This was to be achieved through a reduction of the

number of early retirees by increasing the minimum early retirement age for both men and women, by gradually aligning the statutory old age retirement age of women with the retirement age of the men and by a reduction of the pension benefit. In terms of pension schemes, the reform affects the right to the old-age pension scheme and the average pension for all schemes.

In what follows, we explain the main elements of the reform.

1. Gradual increase in early retirement age for men and women

— The early retirement age for men increases from 55 years in 2015 by 8 months each year until 2021 and then by 6 months until 2023 upon reaching 60 years in 2023. The second requirement for early retirement is that a person has a minimum of 40 years of insurance period and this condition does not change.

— The early retirement age for women rises from 54 years and 4 months in 2015 by 8 months each year until 2021 and then by 6 months until 2023 upon reaching 60 years in 2023. In addition, the second requirement for early retirement related to total insurance period rises from a minimum of 36 years and 4 months by 8 months in 2016, and then each year by 6 months until 2020 when it reaches 39 years. From 2021 until 2023 the minimal total insurance period rises by 4 months upon reaching a minimal insurance period of 40 years in 2023.

The reform of the early retirement scheme is presented in Table 1.

Table 1. Gradual increase in early retirement age for men and women

Year	Men	Women
2015	55 years and 40 years of insurance period	54 years and 4 months and 36 years and 4 months
2016	55 years and 8 months and 40 years of insurance period	55 years and 37 years of insurance period
2017	56 years and 4 months and 40 years of insurance period	55 years and 8 months and 37 years and 6 months of insurance period
2018	57 years and 40 years of insurance period	56 years and 4 months and 38 years of insurance period
2019	57 years and 8 months and 40 years of insurance period	57 years and 38 years and 6 months of insurance period
2020	58 years and 4 months and 40 years of insurance period	57 years and 8 months and 39 years of insurance period
2021	59 years and 40 years of insurance period	58 years and 4 months and 39 years and 4 months of insurance period
2022	59 years and 6 months and 40 years of insurance period	59 years and 39 years and 8 months of insurance period

2023	60 years and 40 years of insurance period	59 years and 6 months and 40 years of insurance period

Source: Law on Pension and Disability Insurance (2014)

2. Gradual increase in the statutory retirement age for women

⸺ The pensionable age for women is being gradually increased by 6 months every year from 1 January 2015 onwards until 2020 and then by 2 months every year until 2032, upon reaching 65 in 2032. These changes are presented in detail in Table 2.

Table 2. Gradual increase in statutory retirement age for women

Year	Statutory retirement age for old age pensions	Year	Statutory retirement age for old age pensions
2015	60 years and 6 months	2024	63 years and 8 months
2016	61 years	2025	63 years and 10 months
2017	61 years and 6 months	2026	64 years
2018	62 years	2027	64 years and 2 months
2019	62 years and 6 months	2028	64 years and 4 months
2020	63 years	2029	64 years and 6 months
2021	63 years and 2 months	2030	64 years and 8 months
2022	63 years and 4 months	2031	64 years and 10 months
2023	63 years and 6 months	2032	65 years

Source: Law on Pension and Disability Insurance (2014)

3. Reduction of pension benefits

⸺ Pensions up to 25,000 RSD remain unchanged.

⸺ Pensions between than 25,000 and 40,000 RSD are taxed at a rate of 22% and the tax applies only on the amount above 25,000 RSD.

⸺ Pensions above 40,000 RSD are taxed at a rate of 22% on the amount 25,000 to 40,000 RSD and the amount of the pension above 40,000 RSD is taxed at a rate of 25%.

DATA AND METHODOLOGY

Data

The Labour Force Survey in Serbia is conducted since 1994, but the survey has undergone a number of changes to be adapted to the EU-LFS methodology.

The most important changes were those introduced in 2008 and in 2014 (SORS, 2017).

The change in 2008 included the shift to ILO definition of employees, and therefore included informal and temporary workers to a greater extent. Additionally, the change included a shift to bi-annual collection of data, instead of annual, as well as a change in the sampling procedure. Therefore, the data series available from the LFS are not comparable before and after 2008.

The change in 2014 included a change in the data collection frequency to 4 times per year, as well as significant changes in the post-stratification procedure. Therefore, the data series available from 2008-2013 and 2014-2016 periods are also not fully comparable (SORS, 2017). According to the SORS, the currently produced labour market indicators are in line with those for other European countries which use EU-LFS.

Employment, unemployment and inactivity in LFS data are defined by the International Organization of Labour (ILO). According to this definition, all those who worked at least one hour a week within the previous week are considered as employed. This means that employment includes workers working for wage as well as self-employed, both full time and part time workers, as well as workers from both formal and informal economy. Among those who do not work, the unemployed are defined as those who are actively looking for work and who are ready to start working within two weeks. Employed and unemployed are considered active, while those who do not belong to these groups are inactive (if they are aged over 15). Inactivity rate represents the share of inactive in the total working-age population, while they also can be defined for a specific age cohort.

Methodology for the activity rate projection

The estimation of the total labour force is defined in accordance with the Cohort Simulation Model (CSM). The CSM methodology is used in a number of studies which seek to perform medium- and long-term projections of the activity rates in a country. The methodology is first developed for the OECD by Burniaux et al (2003) and further adopted by Carone (2005). In this paper, we follow the methodology described in the Ageing report (DG ECFIN & AWG, 2014). The methodology consists of several steps:

1. The starting point of the projection

The starting point of the projection of the labour force trends is the calculation of the participation rates by gender and single age cohort for the last year available – for Serbia this is 2016. We calculate the rates using the Labour Force Survey data, provided by SORS.

2. Calculation of the entry/exit rates

In the next step, we calculate the entry/exit rates by gender and single age cohort, based on the formula provided in the Ageing report (DG ECFIN & AWG, 2014, p. 98). For the cohorts with the increasing participation rates, the entry rate Ren_{x+1} is calculated as

$$Ren_{x+1} = \frac{Pr_{x+1}^{t+1} - Pr_x^t}{1 - Pr_x^t},$$
(1)

where Pr_x^t is the participation rate of people aged x years in the year t, and Pr_{x+1}^{t+1} is the participation rate of the people from the same age cohort a year later. Since we monitor their participation in year t+1 they will be aged x+1 years. Therefore, the expression $Pr_{x+1}^{t+1} - Pr_x^t$ indicates the annual rate at which the people aged x years in the year t enter the labour market in the following year.

On the other hand, if the participation rate for a specific age cohort is decreasing, the exit rate is calculated as:

$$Rex_{x+1} = \frac{Pr_x^t - Pr_{x+1}^{t+1}}{Pr_x^t},$$
(2)

where Pr_x^t again represents the participation rate of people aged x years in the year t, and Pr_{x+1}^{t+1} is the participation rate of the people from the same age cohort a year later. The expression $Pr_x^t - Pr_{x+1}^{t+1}$ therefore represents the annual rate at which the people aged x years in the year t exit the labour market in the following year.

In the Ageing report (DG ECFIN & AWG, 2014), entry/exit rates are calculated as the average rates for the specific gender and age for the last ten years (2004-2013). For Serbia, as mentioned before, LFS data are comparable with the ILO definition only since 2008, with another significant change in the methodology in 2014. Therefore, having in mind that the data are fully comparable from 2008 to 2013 and from 2014 to 2016, we will calculate the exit and entry rates as averages for the comparable periods (i.e. averages of 7 yearly exit and entry rates).

The Cohort Simulation Model assumes that the exit/entry rates by gender and age cohorts will remain the same throughout the projection period. This assumption will later be relaxed to accommodate for the effects of the pension system.

3. Projection of the activity rates

After obtaining the entry and exit rates in the second step, in this step we calculate the projected activity rates from 2016 onwards. The projection of the participation rates for the cohorts with increasing participation is calculated as (DG ECFIN & AWG, 2014):

$$Pr_{x+1}^{t+1} = Ren_{x+1}(1 - Pr_x^t) + Pr_x^t$$
(3)

where Pr_{x+1}^{t+1} is the projected participation rate of the people aged x+1 years in year t+1. Therefore, for example, the participation rate for persons aged 20 years in 2017 is the function of the actual participation rate for those aged 19 years in 2016 and the average entry rate for this group in the 2008-2013 and 2014-2016 periods. Similarly, the participation rate for persons aged 21 years in 2018 is the function of the projected participation rate for those aged 20 years in 2017 and the average entry rate for this group in the 2008-2013 and 2014-2016 periods. For cohorts with decreasing participation the projection is calculated as (DG ECFIN & AWG, 2014):

$$Pr_{x+1}^{t+1} = (1 - Rex_{x+1}) * Pr_x^t.$$
(4).

Similarly, to the situation with entry rates the participation rate for persons aged 56 years in 2017 is the function of the actual participation rate for those aged 55 years in 2016 and the average exit rate for this group in the 2008-2013 and 2014-2016 period, while the participation rate for persons aged 57 years in 2018 is the function of the projected participation rate for those aged 56 years in 2017 and the average exit rate for this group in the 2008-2013 and 2014-2016 period.

The impact of the retirement reform

As mentioned in the previous section, the exit rates for older workers (55-64) represent the average historical exit rates for 2008/2013 and 2014/2016 period. As it has been established in a number of previous research (e.g. Duval 2003; Bassanini and Duval, 2006) the reform of the pension system has significant effects on the older workers' activity. Following Ageing report (DG ECFIN & AWG, 2014), we take into account the changes of pension system by adjusting the exit rates of the workers. Exit rates for people aged between 55 and 74, calculated separately for both genders, are 'shifted' forward according to the expected effects of pension reforms. We perform these adjustments in three steps, corresponding to three different changes of the pension system: change in the male early retirement options, change in the female early retirement options and change in the female old-age retirement options.

The rules of the changes of the retirement system are fully described in Chapter 2. Here we describe how we implemented these changes in the projection of the activity rate.

1. Changes in the male early retirement schemes

As already mentioned, for men there is a gradual increase of the early retirement options between 2016 and 2023. The process of including these changes into the projection of the activity rates first includes the calculation the average male pre-early retirement exit rate based on available data on the exit rate for men aged between 52 and 54 (for 2008-2013 and 2014-2016 periods) as the ages preceding the early retirement according to the current rules.

According to the rules described in the chapter 2 the male exit rates will be changed for the following groups:

— For those aged 56 years in 2016 exit rates will not be changed, as they are already eligible for early retirement

— Those aged 55 years in 2016 will become eligible for early retirement at the age of 56 in 2017, and for them we do not change their exit rates.

— Those aged 54 in 2016 will become eligible for early retirement in 2020, when they are 58 years old. Their exit rates are changed with the pre-early retirement exit rate when they reach 56 (2017) and 57 (2018) years, as in these years they cannot go to early retirement, unlike the previous generations

— Those aged 53 in 2016 become eligible for early retirement in 2023 when they reach 60 years of age. Their exit rates are changed with the pre-early retirement exit rate when for the ages between 56 (2017) to 59 (2018) years, as, unlike the previous generations, in these years they cannot go to early retirement

— Those aged 52 or less in 2016 become eligible for early retirement at the age of 60 years when they reach this age. Similarly to those aged 53 in 2016, we change their exit rates for the ages between 56 to 59 years with pre-early retirement exit rates

— The full scheme of the changes is presented in table 3.

Table 3: Changes of the early retirement options for men

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
56											
55	*56*										
54	55	**56**	**57**	*58*							
53	54	55	**56**	**57**	**58**	**59**	*60*				
52	53	54	55	**56**	**57**	**58**	**59**	*60*			
51	52	53	54	55	**56**	**57**	**58**	**59**	*60*		
50	51	52	53	54	55	**56**	**57**	**58**	**59**	*60*	
49	50	51	52	53	54	55	**56**	**57**	**58**	**59**	*60*

Note: The numbers in the table represent the age of the workers in the years presented in the first row. The grey area indicates the person is not eligible to go to early retirement in that year, while the white area indicates that they are. The numbers in bold indicate the difference in the early retirement years between the current rules and rules according to the new pension scheme. Source: Own elaboration based on Table 1.

2. Changes in the female early retirement schemes

Similar to men, there is a gradual increase of the female early retirement options between 2016 and 2023. We calculate the average female pre-early

retirement exit rate based on available data on the exit rate for women aged between 51 and 53 as the years preceding the early retirement according to the current rules.

According to the rules described in the chapter 2 the early retirement options will be changed for the following groups:

— For those aged 55 years in 2016 exit rates will not be changed, as they are already eligible for early retirement.

— Those aged 54 years in 2016 become eligible for early retirement at the age of 56 in 2018. For this group, we change the exit rates when they reach 55 years (in 2017), with the female pre-early retirement exit rate, since they, unlike the previous generations, cannot go to early retirement at this age.

— Those aged 53 in 2016 become eligible for early retirement at the age of 58 in 2021. For this group, we change the exit rates for the ages 55 to 57 (2018 - 2020), with the female pre-early retirement exit rate, since they, unlike the previous generations, cannot go to early retirement at these ages.

— Those aged 52 or less in 2016 become eligible for early retirement at the age of 59 years and 6 months when they reach this age. We change their exit rates from 55 to 59 years with the female pre-early retirement exit rate.

— The full scheme of the changes is presented in table 4.

Table 4: Changes of the early retirement options for women

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
55												
54	**55**	*56*										
53	54	**55**	**56**	**57**	*58*							
52	53	54	**55**	**56**	**57**	**58**	**59**	*60*				
51	52	53	54	**55**	**56**	**57**	**58**	**59**	*60*			
50	51	52	53	54	**55**	**56**	**57**	**58**	**59**	*60*		
49	50	51	52	53	54	**55**	**56**	**57**	**58**	**59**	*60*	
48	49	50	51	52	53	54	**55**	**56**	**57**	**58**	**59**	*60*

Note: The numbers in the table represent the age of the workers in the years presented in the first row. The grey area indicates the person is not eligible to go to early retirement in that year, while the white area indicates that they are. The numbers in bold indicate the difference in the early retirement years between the current rules and rules according to the new pension scheme.   Source: Own elaboration based on Table 1.

3. Changes in the female old age retirement schemes

Old age retirement scheme will be gradually changed for women between 2015 and 2032. In order to account for this change we calculate the average female pre-old age retirement exit rate based on available data on the exit rate for women aged 59 as the year preceding the early retirement according to the current rules.

The full scheme of the changes is presented in table 5. In what follows we explain these changes in detail:

— Those aged 59 years in 2016 will become eligible for retirement at the age of 62 in 2019 (we change the exit rates for the ages 60 and 61 (2017 and 2018), with the pre-old age retirement exit rate, since they, unlike the previous generations, cannot go to old age retirement at these ages.

— Those aged 58 years in 2016 will become eligible for retirement at the age of 63 in 2021. Therefore, we change their exit rates for the ages 60-62 (2018-2020), with the pre-old age retirement exit rate

— Those aged 57 years in 2016 will become eligible for retirement at the age of 63 in 2022. Therefore, we change their exit rates for the ages 60-62 years (2019-2021), with the pre-old age retirement exit rate

— Those aged 56 years in 2016 will become eligible for retirement at the age of 64 in 2024. We change their exit rates for the ages 60-63 years (2020-2023), with the pre-old age retirement exit rate.

— Those aged 55 years in 2016 will become eligible for retirement at the age of 64 in 2025. We change their exit rates for the ages 60-63 years (2021-2024), with the pre-old age retirement exit rate.

— Those aged 54 years in 2016 will become eligible for retirement at the age of 64 in 2026. We change their exit rates for the ages 60-63 years (2022-2025), with the pre-old age retirement exit rate.

— Those aged 53 years in 2016 will become eligible for retirement at the age of 64 in 2027. We change their exit rates for the ages 60-63 years (2023-2026), with the pre-old age retirement exit rate.

— Those aged 52 years in 2016 will become eligible for retirement at the age of 64 in 2028. We change their exit rates for the ages 60-63 years (2024-2027), with the pre-old age retirement exit rate.

— Those aged 51 years in 2016 will become eligible for retirement at the age of 65 in 2030. We change their exit rates for the ages 60-64 years (2025-2029), with the pre-old age retirement exit rate.

— Those aged 50 years or less in 2016 will become eligible for retirement at the age of 65. We change their exit rates for the ages 60-64 years, with the pre-old age retirement exit rate.

Table 5: Changes of the old-age retirement scheme for women (2016 - 3032)

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
60																			
60	**61**	62																	
58	59	**60**	**61**	**62**	63														
57	58	59	**60**	**61**	**62**	63													
56	57	58	59	**60**	**61**	**62**	**63**	64											
55	56	57	58	59	**60**	**61**	**62**	**63**	64										
54	55	56	57	58	59	**60**	**61**	**62**	**63**	64									
53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	64								
52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	64							
51	52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	**64**	65					
50	51	52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	**64**	65				
49	50	51	52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	**64**	65			
48	49	50	51	52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	**64**	65		
47	48	49	50	51	52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	**64**	65	
46	47	48	49	50	51	52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	**64**	65
45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	**60**	**61**	**62**	**63**	**64**

Note: The numbers in the table represent the age of the workers in the years presented in the first row. The grey area indicates the person is not eligible to go to old-age retirement in that year, while the white area indicates that they are. The numbers in bold indicate the difference in the   old-age retirement years between the current rules and rules according to the new pension scheme.

Source: Own elaboration based on Table 2.

RESULTS

Figure 1 presents the average entry rates for each year by gender. As expected, the entry rates are distinctly positive for youth, i.e. until the age of 28. The entry rates are especially high at the age of 19 (the entry rate at this stage amounts to 16.2% for men and 9.7% for women), age at which the secondary school ends, and around at the age of 24 (8.4% for men and 9.6% for women), after the completion of the tertiary level of education. The ages between 29 and 48 can be described as ages with zero entry/exit rates. For these ages the entry/exit rate are either close to zero or alternate between positive and negative values. The rates are negative (exit rates) after the age of 49, and peak between the age of 56, when early retirement options are available and 60 for women and 65 for men, when regular retirement options are available for women and men respectively.

Figure 1: Average entry and exit rates for men and women, by age cohorts
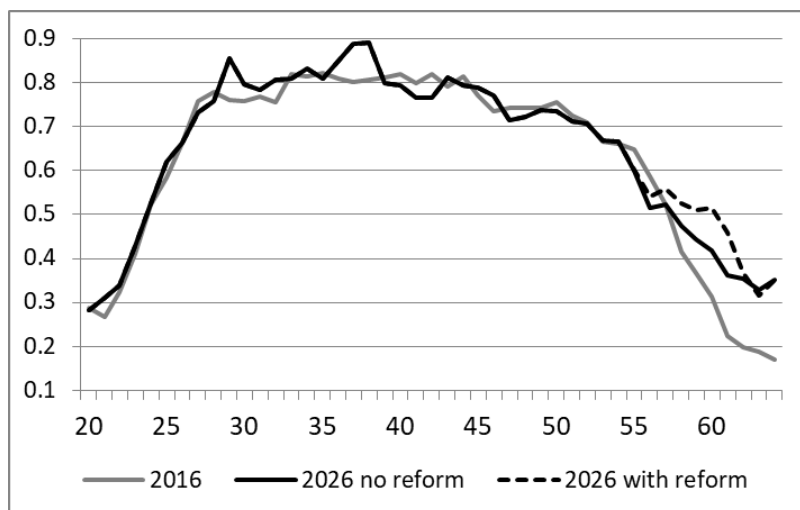*Source: Own calculations based on the LFS data*

Based on the participation rates for 2016 and the calculated entry/exit rates, we project the participation rates until the 2060, by using the equations (3) and (4) from the methodology section. For the simplicity of the presentation we limit our results only to the projection for 2026, which serves as medium-term projection, and 2060, which is our long-term projection. For both medium and long-term projections, we present the results (1) without pension reform, which reflect the demographic trends and the trends in the activity rate captured by the entry and exit rates from 2008-2013 and 2014-2016 period; and (2) with the pension reform, which reflect the demographic trends, trends in the activity rate and further

expected shifts in the activity rate which are due to changes in the pension schemes.

The projected activity rates and impact of the retirement reform for women

Figures 2 presents the projected changes in the participation rates of women in all age cohorts, in 2026 (top panel) and 2060 (bottom panel). The results of the projection indicate that both in the medium-term and in the long-term, we can expect the increase of the activity of older women, regardless of the pension reform (comparison between the grey and black full lines in Figure 2, top and bottom panel). This result fits well with the general trend of the stronger inclusion of the older population in the labour force and the future development of gender equality in the country. Additionally, both medium- and the long-term projections indicate an increased participation of younger women (around the age of 30) and women in prime-age group (between the ages of 35 and 40), which again fits well with general trend of stronger inclusion of women in the labour force.

The main question of our research was related to the effect of the pension reform on the activity rates. Figure 2 indicates that projected female activity rate for older women is further shifted upwards as a result of the pension reform (comparison between the solid and dashed black line in Figure 2, top and bottom panel), from the age of 55 to the age of 64 in the medium-term and 55 to 64 in the long-term. This difference is expected as the old-age pension reform for women is set to be complete only in 2032, which is six years after our medium-term projection year – 2026.
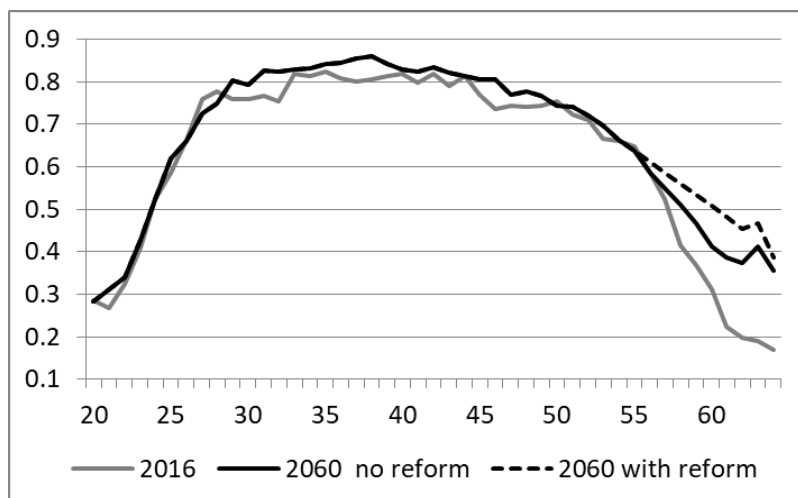
Figure 2: Participation rates in 2016, 2026 (top) and 2060 (bottom panel) for
women, with and without the pension reform by age cohorts
Source: Own calculations based on the LFS data

The described results from the Figure 2 are summarized in Table 6. In 2016 female activity rate in Serbia for the 20-64 age group stood at 62.1%. Our medium-term projection indicates that without the pension reform the 20-64 female activity rate would rise to 65.1% in 2026 (by 3 percentage points compared to 2016), merely as the result of the demographic trends and the trends in the activity rate captured in the entry/exit rates. With the pension reform included in the projection the female 20-64 activity rate rises to 66.0%, i.e. it increases by 0.9 percentage compared to the projection without the pension reform.

On the other hand, in the long-run (2060), female 20-64 activity rate increases to 67.7%, or by 5.6 percentage points, compared to the 2016, even without the pension reform. Projected growth of the participation rates is in line with the rates reported in the Ageing report, where the overall growth of the female 20-64 activity rate in the EU on average is 5.8p.p. (DG ECFIN & AWG, 2014; p.58). When we include the pension reform in the projection, the projected activity rate is further shifted by 1.1 percentage point to 68.9%.

Table 6: Projected participation rates for the 20-64 and 55-64 age groups, women

	20-64			55-64		
	Without the reform	With the reform	Difference	Without the reform	With the reform	Difference
2016	62.1%	-	-	35.3%	-	-
2026	65.1%	66.0%	0.9 p.p.	43.6%	47.3%	3.6 p.p.
2060	67.7%	68.9%	1.1 p.p.	47.1%	52.4%	5.3 p.p.

Source: Own calculations based on the LFS data

As the pension reform presumably has an impact only on the activity of older women we also analyse the trends of the female activity rate for the 55-64 age

group (Table 6). The activity rate for this age group in 2016 stood at the very low level of 35.3%, being lower than the one for men by 23 percentage points (compare Table 6 and Table 7). Our medium-term projections indicate that this rate in 2026 will increase significantly even without the pension reform and that it will reach 43.6%, while by 2060 the rate will increase to 47.1%. This increase of 8.3 and 11.8 percentage points for 2026 and 2060 respectively is expected due to the labour market trends which fits to the general trend of the stronger inclusion of the older female population to the labour market and is again in line with the predictions from the Ageing report (DG ECFIN & AWG, 2014; p.58).

Pension reform, which proposes to postpone the ages at which women can go to early and   old-age retirement further increases the activity rate by 3.6 percentage points to 47.3%. In the long run, female 55-64 activity rate is projected to increase to 47.1% (by 11.8 percentage points) without the pension reform, and is further increased by 5.3 percentage points (to 52.4%) when the pension reform is included in the projection.

The projected activity rates and impact of the retirement reform for men

Similar to Figure 2 which presents the changes in the activity rates for women, Figure 3 presents the projected changes in the participation rates for men for each age cohort in 2026 (top panel) and 2060 (bottom panel). The figure indicates that in the medium-term the projected participation rates will increase for younger men, between the ages of 27 and 32, as well as for older men (aged 62 to 64), only as a consequence of the projected trends in the activity rates. At the same time, the rates for men in the prime-age group, around the ages of 45 and from 50 to 54 will be lower in 2026 than in 2060 (the comparison between the grey and black solid lines in Figure 3, top panel). The effect of the changes in the early retirement scheme are present for the men between 56 and 60 years of age (comparison between the solid and dashed black line in Figure 3, top panel) although they appear to be much lower than for women.

In the long run, the projections indicate an increase of the male participation rates at the ages from 27 to 38, while the decreasing trends for the prime-age group mentioned previously will disappear (the comparison between the grey and black solid lines in Figure 3, bottom panel). Similar to the medium-term projections, we observe an increase of the activity rates for older workers (aged between 56 and 60 years of age), due to the effects of the retirement reform which are slightly higher, compared to the medium-term projections (comparison between the solid and dashed black line in Figure 3, bottom panel).
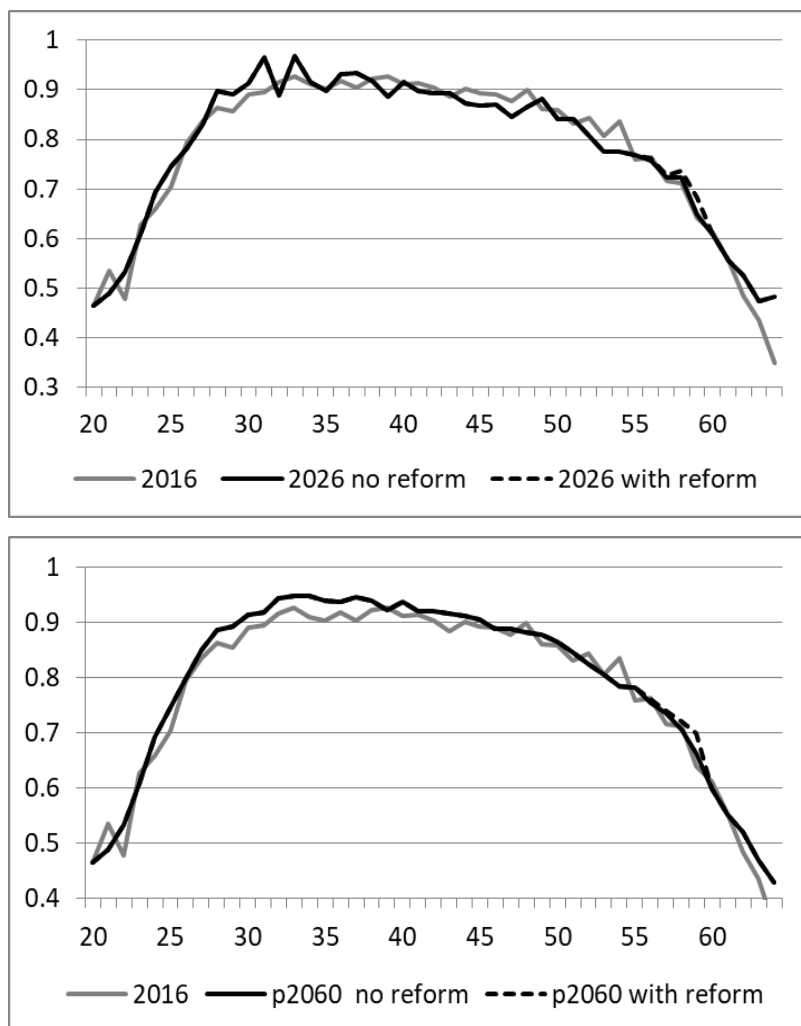
Figure 3: Participation rates in 2016, 2026 (left) and 2060 (right panel) for men,
with and without the pension reform by age cohorts
Source: Own calculations based on the LFS data

Participation rate projections for each age group presented in the Figure 3 are summarized in the Table 7. In 2016 male activity rate in Serbia for the 20-64 age group stood at 78.1%. According to our medium-term projection, the 20-64 male activity rate would rise to 78.9% in 2026, or by 0.8 percentage points compared to 2016. This rise is merely the result of the demographic trends and the trends in the activity rate captured in the entry/exit rates. With the reform of the early retirement scheme included in the projection the rate rises to 79.0%, i.e. it increases only by 0.1 percentage compared to the projection without the pension reform.

In the long run, male 20-64 activity rate increases to 80.0%, i.e. it increases or by 1.9 percentage points, compared to the 2016, if the effects of the pension reform

are not included in the projection. The projected increase of the male activity rate is also in line with the results from the Ageing report, in which the growth of the male 20-64 activity rate in the EU on average by 2060 is estimated at 1.1p.p. (DG ECFIN & AWG, 2014; p.58). When we include the pension reform, the projected male 20-64 activity rate is, similarly to the medium-term projection, further shifted by 0.1 percentage points to 80.1%. The fact that the effects of the changes in the early retirement scheme do not change between the medium-term and long-term projections is expected as the reform is going to be fully introduced by 2023.

Table 7: Projected participation rates for the 20-64 and 55-64 age groups, men

	20-64			55-64		
	Without the reform	With the reform	Difference	Without the reform	With the reform	Difference
2016	78.1%	-	-	59.8%	-	-
2026	78.9%	79.0%	0.1 p.p.	62.9%	63.5%	0.6 p.p.
2060	80.0%	80.1%	0.1 p.p.	62.5%	63.1%	0.6 p.p.

Source: Own calculations based on the LFS data

Since the reform of the early retirement scheme has impacted primarily the activity of older male workers we also analyse the trends of the 55-64 male activity rate. The activity rate for this age group in 2016 stood at 59.8%. Medium-term projections indicate that this rate will increase to 62.9% in 2026, even without the pension reform. The increase of 3.1 percentage points is expected due to the labour market trends which indicate a trend of higher participation of older workers. The reform of the early retirement scheme, which pushes the age for male early retirement forward, increases the activity rate by additional 0.6 percentage points to 63.5%.

Male 55-64 activity rate is projected to be 62.5% in 2060 (without the pension reform) which is an increase of 2.7 percentage points compared to the 2016, although the rate is on the slight downward trend when compared to 2026. This decrease can be the result of the higher participation rates of the generation which will be in the 55-64 age bracket in 2026. Similarly to the medium-term projections the participation rate is increased by 0.6 percentage points (to 63.1%) when the pension reform is included in the projection.

Total projected activity rates and impact of the retirement reform

In the previous part of the text we analysed the activity rate projections separately for men and women. Now we join these results to monitor the overall results of the activity projections without and with the pension reform (Table 8).

In 2016 total participation (activity) rate in Serbia for the 20-64 age group stood at 70.1% and is below the Europe 2020 goal of 75% by almost 5 percentage points. According to our medium-term projections this goal will not be reached in

2023, since the estimated value of 20-64 activity rate in 2026 is 72.0%. This rise, of 1.9 percentage points is merely the result of the demographic trends and the trends in the activity rate captured in the entry/exit rates. When we include the pension reform in the projection the 20-64 activity rate further increases by 0.6 percentage points to 72.6%, still below the 75% threshold.

According to our projections, by 2060, the total activity rate will increase by almost 4 percentage points to 74.0% (without the pension reform), result similar to the 3.5 percentage points average EU 20-64 activity rate increase until 2060 (DG ECFIN & AWG, 2014; p.58). When we include the pension reform, the projected 20-64 activity rate increases by 0.7 percentage point, to 74.7%. Therefore, only in 2060 will Serbia, according to our projections approximately reach the Europe 2020 goal of 75% activity rate for the age group 20-64.

Table 8: Projected participation rates for the 20-64 and 55-64 age groups

	20-64			55-64		
	Without the reform	With the reform	Difference	Without the reform	With the reform	Difference
2016	70.1%	-	-	47.0%	-	-
2026	72.0%	72.6%	0.6 p.p.	52.9%	55.1%	2.2 p.p.
2060	74.0%	74.7%	0.7 p.p.	55.0%	57.9%	2.9 p.p.

Source: Own calculations based on the LFS data

As the reform of the early and old-age retirement schemes will affect the possibility of the   55-64 age groups to withdraw from activity to retirement, and therefore primarily affect their activity, we separately analyse the projected 55-64 activity rates. In 2016, the activity rate for this age group stood at 47.0%, the result of the much higher activity rate for men than for women (59.8% vs. 35.3%). According to our medium-term projections the 55-64 activity rate will increase to 52.9%, or by 5.9 percentage points, until 2026, even without the pension reform. The growth in this period, according to the activity rate trends, captured in the entry and exit rates, will be much more under the influence of the growth of the female than of the growth of the male 55-64 activity rate (8.3 vs. 3.1 percentage points). When we include the effects of the pension reform in the projection, the 55-64 activity rate in 2026 increases to 55.1%, i.e. by additional 2.2 percentage points.

Long-term projections suggest that the 55-64 activity rate will be 55.0% in 2060 (without the pension reform) which is an increase of 8 percentage points compared to the 2016 and is again is the result of the higher increase of the female and lower increase of the male activity rate (11.8 vs. 2.7 percentage points), therefore contributing to the lower activity gap between the genders in this age

group. The 55-64 participation rate is further increased by 2.9 percentage points (to 57.9%) when the pension reform is included in the projection.

DISCUSSION AND CONCLUSIONS

Besides high unemployment, Serbia is also a country with high labour market inactivity. Older workers (55-64) activity rates, which stood at 47.0% in 2016 are much lower than for the working age population (20-64), which stood at 70.1% in the same year. As such, older workers are identified as one of the key groups for which the measures of activation policy should be addressed to. Additionally, female 55-64 activity rate stood at 35.3%, and it was lower than male (59.3%), by 23 percentage points. The gender difference is partially due to the differences in gender roles, but also due to the difference in regular retirement age for men and women, which in 2016 was 60 years for women and 65 years for men.

The pension reform in Serbia, introduced in 2014, which included the change in the early retirement schemes for both men and women (until 2023), and the equalization of the retirement age for men and women by increasing the old-age retirement conditions for women (by 2032). The expected outcome of the pension reform was that it will increase the participation of older workers and lower the gap between the genders in this age group.

To our knowledge this is the first paper to investigate ex ante the effects of this reform on the participation rate of the working age population and older workers using the Cohort Simulation Model. We project the activity rates in two scenarios: without and with the pension reform and compare the results to obtain the effects of the pension reform.

Our activity rate projection, based on the Cohort simulation model and the Labour force survey data from 2008 to 2016, suggests that the activity rate in the 55-64 age group will increase by 5.9 percentage points until the 2026 and by 8 percentage points until 2060, merely as the result of the demographic trends and the trends in the activity rate captured in the entry/exit rates and without the inclusion of the pension reform in the projection. This growth is much higher for women than for men (8.3 vs. 3.1 percentage points by 2026; and 11.8 vs. 2.7 percentage points by). This result fits well with the current labour market situation and expectations. Firstly, much lower female activity rates in 2016 suggest that women have much more "room" to increase their activity than men. Secondly, recent development of gender equality in the country is expected to have medium- and long-term consequences on the higher inclusion of women in the labour market.

Our projection indicates that the pension reform will increase the 55-64 activity rate by additional 2.2 and 2.9 percentage points for 2026 and 2060 respectively. Given the design of the reform, which includes change in the early retirement options for both genders, but the change of old-age retirement conditions only for women, majority of this effect is again due to the increase of

female 55-64 activity rate. As a consequence of the pension reform, the female 55-64 participation rate will increase by additional 3.6 percentage points in 2026 and by additional 5.3 p.p. in 2060, while the increase of the male rate amounts to 0.6 percentage points for both years. Overall, due to the activity trends and the pension reform, the gender gap in the 55-64 activity rates will be reduced from 23 percentage points in 2016 to 16.2 percentage points in 2026 (63.5% vs. 47.3%), and 10.7 percentage points in 2060 (63.1% vs. 52.4%).

Overall activity rate for the working age population (20-64) will increase to 72.6% in 2026 and to 74.7%, indicating that the Europe 2020 target of 75%, given the demographic trends, trends in the activity rate and the pension reform will approximately be reached only in about 40 years in Serbia. This result, of course, has to be taken with caution, because our model assumes that the entry and exit rates will be stable throughout the period. However, we believe it represents a good indicator of the future trends if these trends remain the same.

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