

THOUGHTS ABOUT THE CONNECTION BETWEEN DEMOGRAPHY AND THE FINANCES OF THE PENSION SYSTEM*

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1. Introduction

The aging process has many economic consequences, both for society as a whole and for the lives of individuals. However, the largest macroeconomically important institution affected by this process is the pension system. In debates about its reform, it is often said that this system should stimulate economic growth, help the expansion of capital markets. In contrast, its real purpose and task is to create a livelihood security for old age based on the income of the working life stage. This article will look at the impact of demographic change, in other words, aging, on the pension system and its finances. The demographic “aging” of the population, i.e. the increase in the proportion of older age groups, stems from two factors: the increase in life expectancy and the change in the number of births. The former is a welcome, continuous and, to our current knowledge, irreversible trend. However, the latter is a cyclical process determined not only by current, relatively low fertility. On the contrary, the extremely populous vintages born in the early 1950s (their members are called the Ratkó child in our country, the baby boomer in the rest of the world) and their large number of children, also born in the late 1970s, will cause significant fluctuations in the age composition of the population for decades to come. The fluctuation will put strong pressure on pension systems first this year, in 2020, and then for the second time around 2050, when these populations reach the threshold of retirement age.¹

At the same time, it should also be borne in mind that the “burden” on working-age people is greatly exaggerated by the demographic dependency rate in old age,

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¹ AUGUSZTINOVICS, MÁRIA: A nyugdíjrendszerekről (About the pension systems). *Magyar Tudomány*, 2002/4, p. 447. <http://www.matud.iif.hu/02apr/auguszt.html> (2020. 11. 20.)

precisely because the proportion of dependent children and minors will decrease. The total demographic dependency ratio (the combined ratio of younger and older people of working age to able-bodied people) “...will not be higher when the ‘baby-boom’ generation retires than it did when they went to school”.²

For pension systems, the system dependency rate (the ratio of pensioners to contributors) is more important than the demographic rate anyway. However, there may be a significant discrepancy between the two due to labor market developments. The demand for labor in the “new economy” is expected to decline further. Within this, new so-called “atypical” forms of employment are spreading. Part-time, business, fixed-term contracts will replace full-time employment, the traditional relationship between employer and employee. The full-time employment rate “...is in Europe at about the same level as it was in 1985... it is possible that another wave of growth will not significantly reduce unemployment: Europe may enter a phase of growth without jobs.”³

These trends are undermining the scope and contribution base of defined benefit pension schemes in the European Union as well as in the transition countries of Central and Eastern Europe.⁴ The economic environment is therefore far from favorable for traditional pension schemes. However, the challenge must be met and can be offset, at least in part, by forward planning systems.⁵

In recent decades, due to low fertility and longer life expectancy, the proportion of older people in the population has increased in many countries around the world, including Hungary. Demographic aging is a well-documented phenomenon at both European and national levels. In Hungary, the proportion of the population aged 65 and over was 13% in 1990, then reached 15% by 2001 and 17% by 2011. By the beginning of 2014, the proportion of this age group had risen to 17.5%.⁶

According to the latest data for the beginning of 2017, the proportion of this age group has risen to 19%. According to Eurostat forecasts, the value of the indicator will grow even more strongly in the future, by 2070 it will reach 29 percent in Hungary. One of the most important social significance of the development of the age structure lies in the effects of these processes on the sustainability of various social institutions. That is, how dependency rates evolve and how many people of active age need to “support” those of inactive age. The decline in the number of working-

² CONCIALDI, P.: Demography, the Labour Market and Competitiveness. In: Hughes, G. – Stewart, J. (eds.). *Pensions in the European Union: Adapting to Economic and Social Change*. Kluwer Academic Publishers, Boston/Dordrecht/London, 1999.

³ DUCATEL, K. D. – BURGELMAN, J. C.: *Employment Map: Jobs, Skill and Working Life on the Road to 2010*. Futures Report Series 13, European Commission Directorate-General, Joint Research Centre, Institute for Prospective Technological Studies, Sevilla, Spain. 1999.

⁴ AUGUSZTINOVICS MÁRIA: Nyugdíjrendszerek és reformok az átmeneti gazdaságokban. *Közgazdasági Szemle*, 1999, július–augusztus, pp. 657–672.

⁵ AUGUSZTINOVICS MÁRIA (2002): op. cit. 447.

⁶ MONOSTORI Judit: Öregedés és Nyugdíjba vonulás. In: Monostori Judit – Óri Péter-Spéder Zsolt (szerk): *Demográfiai portré 2015*. KSH NKI, Budapest, 2015, p. 118.

age people also means a shrinking labor force potential, which is accompanied by difficulties in the sustainability of large public benefit systems.

The old-age dependency ratio expresses the number of elderly people (65 years and older) per 100 active ages (15–64 years). The value of the indicator in Hungary increased from 20 to 28 between 1990 and 2017. According to Eurostat calculations, it will rise to 52 by 2070, i.e. approx. A resident over the age of 64 will reach 2 active ages.⁷

The relative proportions of children and the elderly are expressed in the aging index. The value of this indicator in Hungary is growing more dynamically than the old-age dependency ratio, which is a consequence of the extremely low fertility rates, and predicts that in the future the proportion of the active age and the elderly will show an even more unfavorable picture than today. Between 1990 and 2017, the value of the aging index, i.e. the number of elderly population per 100 children, increased from 65 to 129.⁸

Demographic aging is a phenomenon observed in all European countries, usually due to low fertility and longer life expectancy. However, there are already differences in the extent of aging at the societal level, resp. how the strength of the factors influencing it develops. There are also more favorable and unfavorable countries within the generally low fertility rate, but there are also large differences in life expectancy in Europe. Taking into account the old-age dependency ratio, Hungary is one of the countries with a lower value, which can be explained primarily by the still low life expectancy. Among the countries most exposed to demographic aging, we find mainly southern and northern countries, but the value of the indicator is also very high in Germany. In Italy, the extremely low fertility rate is coupled with a high life expectancy, while in Germany and Greece; the extremely low fertility rates are associated with a relatively high but lower life expectancy than in Italy. In the case of the Scandinavian countries, on the other hand, it is not the unfavorable fertility rates but the high life expectancy that is behind it.⁹

2. The pension system from demographic point of view

The most important demographic changes of the last hundred and one hundred and fifty years can be summarized as follows:

1. Since the First World War, fertility has been declining everywhere in the developed world, with only a tiny detour from this more than a century-long process being the two decades of the baby boom.
2. Marriage rates have been steadily declining over the last few decades.
3. Divorce rates are increasing significantly.

⁷ MONOSTORI Judit – GRESITS Gabriella: Idősödés. In: MONOSTORI Judit – ÓRI Péter – SPÉDER Zsolt (szerk.) (2018): *Demográfiai portré 2018*. KSH NKI, Budapest, 129. European Union (2017). *The 2018 Ageing Report. Underlying Assumptions & Projection Methodologies*. European Economy Institutional Paper 065.

⁸ MONOSTORI Judit: op. cit. 117.

⁹ MONOSTORI Judit: op. cit. 118.

4. Single-parent households are common.
5. The number of cohabiting relationships has increased and is growing dynamically.
6. The number of children born out of wedlock is increasing.
7. The number of consciously childless couples is increasing.
8. Mortality rates in old age are constantly improving.¹⁰

Pension schemes are usually organized according to different typologies. A three-dimensional typology is most common in the literature:

1. Covered or unsecured.
2. Insurance is mathematically correct or not.
3. Contribution or benefit specified.

The elements of the systems classified in each cell of this typology obviously have different fertility effects, but for now, let's disregard the different elements. Each pension scheme defines a period of accumulation in the active life of individuals. At the end of the accumulation period, when a certain age is reached, it is usually converted into an annuity by the individual (in the event of the insured's death, those who are left behind usually receive the annuity). The accumulation period in covered schemes is the accumulation of these contributions during the active life stage. In pay-as-you-go systems, coverage is not physical but human capital: the ability and willingness of rising generations to pay contributions. In this system, accumulation means educating and training the next generations.¹¹

According to the contemporary principle of the pay-as-you-go pension system (developed in the immediate aftermath of World War II), contributions paid for the long-term earnings of many active workers cover the relatively few elderly people who typically live only a few years after retirement. This system is based on the trust of three successive generations:

- the parent pays the contribution so that the grandparent has a pension,
- while supporting his child in the hope that he will grow old,
- and your child will pay the contribution from which he will have a pension.

The unsustainability of the system is based on the fact that the number of domestic contributors is shrinking unstopably because, on the one hand, not enough children have been born in the last four decades to replace the large number of retirees in the labor market; on the other hand, an increasing number of young people and middle-aged people do not pay contributions at home, thus missing out on financing domestic pensions. Even in the event of a possible improvement in population conditions, an increase in employment and the reduction of undeclared work, we cannot trust that the trend would be fundamentally different, and that Hungarian

¹⁰ MÉSZÁROS József: *Nyugdíjrendszerek és demográfia: egymásra kölcsönösen ható folyamatok*. http://www.mstnet.hu/cikkek/_doku/Meszáros_Jozsef.pdf (2020. 11. 27.) p. 1.

¹¹ MÉSZÁROS József: op. cit. 2.

(retired) society could expect more pensions and more financing resources in the future.¹²

Pension schemes have been set up to provide care for the elderly in historically homogeneous groups of workers. These groups came from either large-scale industrial workers or civil servants. In the late 1800s and in the 20th century, at the beginning, those employed in this circle were predominantly male, and the income and family positions of the employees were stable and homogeneous. Collecting contributions from homogeneous groups of workers was relatively simple and it was impossible to avoid contributions. Society was in a state of demographic equilibrium or growth, and the economy was in a period of slow but steady growth, i.e.

- the employment structure is stable,
- the demographic situation is favorable,
- society was in a state of economic growth.

We can state that social security pension schemes were organized along these three basic assumptions and still rest on these three conditions. The 20th century was essentially a period of the development and success story of state social systems. By the beginning of the 20th century, essentially every developed state had developed its social security system, which, after World War II, transformed into pay-as-you-go systems depending on the extent of the devastation of the war. We can also follow this process in the transformation of the budget structure. It is particularly interesting to compare the United States and continental Europe in this regard. It is clear from the data that in continental Europe, the development of a social safety net was considered more important by individual societies, while in the United States the role of individual responsibility and responsibility was emphasized.¹³

Society operated within a nation-state framework, it was clear who the subjects of taxes and contributions were and similarly the range of beneficiaries could be easily determined. There was essentially no international mobility, people lived their lives in more or less the same place where they were born. Recent decades have intensified previous processes, i.e., due to declining birth rates and increased age, the age tree of developed societies has changed. While in the past the elderly were in the minority, today the ratio of the elderly to the young has changed radically. This poses new challenges, as the funding of old-age care systems has been based on a different premise, that the current active age groups represent a much higher proportion than the current ones. Thus, policymakers are forced to face raising the retirement age so that the pension system can continue to be funded. In parallel with this challenge, the whole of the world has essentially been covered by the pension systems of society as a whole in the 1970s, and the impact of this is still being felt today.¹⁴

¹² VÉRTESY László: *A nyugdíjrendszer helyzete és finanszírozhatósága*. Pénzügyi műhelytanulmányok 4, Budapest, 2018, p. 14.

¹³ MÉSZÁROS József: op. cit. 3.

¹⁴ MÉSZÁROS József: op. cit. 4.

The most commonly used method of calculating long-term mortality in the demographic literature is the Lee–Carter model¹⁵, which can be used to predict the future evolution of an age- and time-dependent mortality rate. Calculations suggest that the overall mortality trend for women has improved at a slightly faster rate than for men.

There was no constant trend of mortality in Hungary, and there was even a period - especially around the 1990s - when mortality increased in general. In the case of the change in both female and male mortality, it can be said that the years of regime change did not only affect the political and economic dimension, its imprint can also be seen in mortality, as a large-scale deterioration took place at that time. Another indicator used in demography is life expectancy at birth, which is an important indicator of the socio-economic development of a community. For women, life expectancy at birth for 2035 is 82.1 years, while for men this figure is nearly six years lower at 75.9 years. This also supports the well-known phenomenon that in Hungary, on average, women typically live much longer than men.¹⁶

3. The impact of the aging society to the state pay-as-you-go pension system

The social security pension system is usually discussed in several conceptual frameworks, so the problem can be formulated in several ways. The essence of the state pay-as-you-go pension system can be more directly characterized (somewhat simplifying the reality) in that the state, as an authority, continuously imposes a wage contribution obligation on its current active citizens, which pays the pension contributions of its current retired citizens. Active citizens themselves are entitled to a pension annuity by paying their wage contributions. However, this system can also be understood in such a way that the payment of contributions by the current active citizens is essentially a loan to the state, the debt of which will be repaid by the state in the form of a pension annuity. In this conceptual framework, this system therefore operates in such a way that the State finances the pension benefits of the current pensioners from a loan in the form of a wage contribution from the current active citizens. In this way, the state constantly rolls its debt before it, since the repayment of the debt due at any time is financed by the state from its new borrowing due at any time, so it constantly pushes its (implicit) debt to be repaid to the creditors due at all times. Finally, this system can be understood in such a way that the state, as an authority, obliges its current active citizens to compulsorily save in old age. In this conceptual framework, this system thus works in such a way that the state finances the pension benefits of the current pensioners from the forced savings of the current active citizens. It can be seen that the point is the same regardless of the conceptual framework. The state pay-as-you-go pension system operates in such a way that the state finances the current pension annuity of

¹⁵ LEE, R. D. – CARTER, L. R.: Modeling and Forecasting U.S. Mortality. *Journal of the American Statistical Association*, Vol. 87, No. 419, 1992, pp. 659–671.

¹⁶ VÉRTESY László: op. cit. 10.

the current pensioners from the current contributions of the active citizens. That is, the state forcibly deducts the current income generated by the current active citizens to the current retirees. The aging of society means that the number of active citizens is declining due to low fertility, resulting in an increase in the proportion of older people in the population as a whole. The problem that arises can also be articulated within different conceptual frameworks, although the same. The state pay-as-you-go pension system is unsustainable in the long run because there is a depletion of active citizens who use their contributions to fund the pensioners' due (already earned, entitled) annuities. This can also be seen as the depletion of the state's active contributing creditors, so that it is unable to fully finance its current debt repayments from its borrowing at any given time. The period of "living up" with non-existent property is coming. Also, the aging of society can also be understood as the forced savings of active citizens are no longer sufficient to fully fund pensions. The point is that the active citizens of the state are no longer able to fully finance the current (legitimate) pension annuity of pensioners from their current contribution payments. The system is not self-financing, the imbalance is constant. The state needs additional income deductions to create a river, i.e., cross-sectional balance. It can typically be subtracted from the active ones. We can also say that the state obliges active citizens to lend even more and to make even more forced savings.¹⁷

Based on both domestic and international projections, the old-age dependency ratio will almost double over the next 35 years. The fertility rate, along with mortality, largely determines the country's future population. Comparing the active to the number of retirees, we also get the old-age dependency ratio. Both fertility rates and dependency rates largely determine the future sustainability of the current pension system. In addition to the population data, the old-age dependency ratio shows the internal age structure of the studied society, the rate will increase monotonically until 2035, and is expected to approach 39% from below. The expected significant decline in the population and, at the same time, the also intensive increase in the old-age dependency ratio raise serious concerns about the sustainability of the Hungarian pension system.¹⁸

4. The relationship between retirement age and demography

One of the most important changes associated with old age is the cessation of labor market activity and retirement. In this respect, extremely important changes have taken place in Hungary and in several European countries in the last decade, mainly generated by the pension system and some active employment policy instruments. With the raising of the retirement age in old age, the tightening of early retirement, and the transformation of the conditions for disability, the date of leav-

¹⁷ TÓTH ISTVÁN: *Demográfia és nyugdíjrendszer – adalék a nyugdíjrendszerek makroökonómiájához* <http://www.portfolio.hu/cikkek.tdp?k=3&i=76502> (2020. 11. 27.) 1.

¹⁸ VÉRTESY László: op.cit. 11.

ing the labor market has been postponed, especially for women. In addition to the increase in the age limit, another legislative change in Hungary has recently affected the average retirement age: the provision that entered into force in 2012, according to which women can retire before reaching the age limit of 40 years.

As a result, in 2012, the average retirement age for women fell. According to preliminary data, in 2013, the average retirement age for men was 62.2 years and for women 59.4 years. One of the retirement characteristics of the Hungarian population is that older people usually retire for many years before reaching the retirement age for them. This is partly a consequence of wide-ranging labor market and pension policies aimed at alleviating labor market problems. This is partly due to the fact that the increase in the retirement age since 1997 could only have been introduced in a shorter period of time under very high social tensions. That is, in parallel with the raising of the age limit, many of the age groups concerned were given the opportunity provided by law to retire before the age limit. In 2012, this also changed fundamentally, as from this year onwards, an old-age pension – with the exception of women with 40 years of service – cannot be determined before reaching the age limit. As a result, many types of early retirement and several occupational pensions have disappeared. As a result, according to preliminary data for 2013, 90% of men who retire in old age in a given year were just the same age as the general retirement age for their year of birth. The situation was somewhat different for women, but the similarities between men and women are not negligible either. The most important of the latter was the fact that early retirement was also characteristic of women during the period under review. However, the differences between calendar years are stronger in terms of women's retirement. More precisely, the differences between the ages of retirees and the retirement age are also very significant between successive years. This is due to the fact that the retirement age for women has been raised from 55 to 65, and different age limits have been set for each birth year during the transitional years. On the other hand, the timing of women's retirement also differs from that of men in that only one group of them is subject to the tightening introduced in 2012 (i.e. a ban on early retirement), as 40 years of service entitles women to an old-age pension regardless of age. This can be explained by the fact that in 2013, a significant proportion of women, 65%, entered the old-age pension system before reaching their age limit.¹⁹ By population aging we mean the growing proportion of the elderly within the population as a whole. However, the definition of old age is no longer so uniform: 60 (e.g. Eurostat interpretations) or 65 and older (eg UN interpretations) may be included. However, the essence of the process is not only the proportion of the elderly, young people or the employed; the problem is much more general: the whole age composition of the population is changing.

¹⁹ MONOSTORI Judit: *op. cit.* 123.

Demographic aging is basically due to four factors:

– Fertility

In the late 1950s, fertility levels in Europe (thanks to the baby boom) were high, with the average number of children above 2.5. A declining trend begins in the 1960s, by 1980 this value was already below 2. According to UN forecasts (based on the medium hypothesis), countries will converge to a level of 1.85, which is significantly below the level required for supply.

– Mortality

Life expectancy also has an impact on aging with their ever-increasing values. The main reason for this is the rapid development of health systems. Life expectancy at birth in Europe is projected to increase from 73.8 to 81.0 between 2000 and 2050, rising from 78.0 to 84.2 for women and from 69.6 to 77.8 for men. means a change in.

– Immigration

Immigration is able to partially offset population decline and even aging due to its age composition, which is concentrated on the younger generations. However, the relevant statistics should be treated with caution, as the calculation of immigration and emigration can only be imagined indirectly, which carries the potential for error. Immigration and emigration are mainly continental in Europe and have not had a significant impact on aging so far, but are projected to be even more important in the future.

– Age composition

Increasingly longer lifespans have also fundamentally changed in terms of their structure. Not only the expected age has shifted, but also the length of each section. The number of years spent studying has increased significantly, which has delayed, among other things, the start of employment. In addition to all this, the upper limit of working capacity has also moved significantly upwards, which of course also means a change in the optimal retirement age.²⁰

In recent decades, not only has the proportion of the population aged 65 and over increased, but there has also been a restructuring in the age composition of older people. The so-called also the oldest elderly, i.e. the number and proportion of those over 80 years of age. In 1990, 260,000 and in 2011, 400,000 belonged to this age group. Due to the different mortality of men and women, women are overrepresented in older age groups. The older the age group, the higher the proportion of women.²¹

²⁰ STRÉHLI Kitti: *Öregedés és a nyugdíjrendszerek Európában*. Budapest, 2008, http://209.85.129.132/search?q=cache:H9Ewee2PcMoJ:www.corvinusembassy.com/ep/download/2/82/strehli_kitti_-_oregedesnyugdij.doc+%C3%B6reged%C3%A9s+hat%C3%A1sa+a+nyugd%C3%ADjrendszer&hl=hu&ct=clnk&cd=8&gl=hu (2019. 12. 27.), p. 5.

²¹ MONOSTORI Judit: op. cit. 118.

5. The effects of social aging

- For individuals and families

With aging, the proportion of time spent in paid work relative to lifetime decreases. The number of school years and years spent in retirement will increase, while the number of traditional years of work will decrease. Women spend more and more time working, but they are also characterized by high unemployment and frequent part-time employment, which are often forced solutions. The number of people reaching retirement age is sharply rising. By the age of 80, most older people are already struggling with serious health problems and social exclusion. Despite all this, it is becoming more and more difficult to generalize to each age group, the differences within age groups are already larger than between age groups.

Demographic aging affects women and men differently. Women have lower incomes, longer life expectancies, so they live longer alone and, on average, spend more time morally weak at a lower standard of living in the last stages of their lives. The increase in life expectancy - both for women and men - also means the appreciation of being outside the family and a kind of increased burden for the family, as the morally weak elderly often need family support and help.

- For income

As a result of recent decades, the income situation of the elderly in Europe has improved significantly, mainly due to the development of pension systems. On the other hand, poverty remains common among the elderly, especially among divorced, widowed single women. The financial situation of the elderly is mostly higher than that of the other groups, but the reason for this is extremely simple, they have been working on accumulating their wealth for a long time. These data raise the issue of intergenerational equity. This is exacerbated by the awareness that the cost of the necessary transformations of welfare systems should be borne by current young generations. According to some analyzes, and supported by several practical examples, this creates a kind of tension between the generations.²²

- To the economy and especially to the labor market

As a result of demographic change, the average age in the labor market will rise, which makes lifelong learning particularly important, and unemployment may fall. The processes of lowering the previous retirement age have slowed down or they seem to turn back. There have also been fundamental changes in the age composition of the workforce. In the labor market, young people and those close to retirement age are at a significant disadvantage compared to middle-aged people. Changes in consumer demand have led to changes in the structure of the economy, job opportunities and employee demands. Aging has also brought about fundamental changes in the system of savings, investment and capital accumulation, especially with regard to national savings.

²² STRÉHLI Kitti: op.cit. 6.

– To social policy

Health, education, and social policies are highly dependent on the age composition of the population; it is enough to think only of lifelong learning or caring for the elderly. Finding and applying the right procedures for the purpose is more important than ever. In the area of public finances, the pension system is under the greatest pressure. The unaffordability of pension systems poses serious decisions for most European countries. There are also increasing burdens on health due to demographic aging. The complexity and intertwining of the issue requires coherent responses from governments, in particular the coordination of short- and long-term goals and a high level of coordination. Demographic change and the processes closely linked to it pose an unexpected challenge to public policy, fundamentally shaking up a system that has worked so far. The difficulties encountered can be divided into four major groups:

- The first and perhaps most urgent challenge is fiscal policy. Demographic aging is placing increasing burdens on government spending, making current systems unsustainable. This effect is further exacerbated by a slowdown in GDP growth without a significant increase in productivity. This is due to the steady decline in the proportion of people of working age in the population. Together, these processes bring with them a significant slowdown in the rise in living standards (measured in GDP/capita).
- The second task can be related to market sensitivity. Demographic change makes it necessary to set up a stable system that allows for rapid and flexible responses in both labor and financial markets. Reforming the structure is a kind of springboard for making and implementing further reforms, as most of the necessary changes are either not feasible without it or it loses its reality and function. The population needs to be adapted to adapt flexibly in both the labor market and the money and capital markets. Not only the creation of opportunities becomes emphasized, but also the continuous market feedback.
- The third set of challenges concerns individuals. The population must be supported in finding a place in the labor market, as it is important to have active, flexible workers. Particular attention needs to be paid to those in front of retirement, for whom potential long-term health problems make this significantly more difficult. In addition, it is important for individuals to learn to structure their longer lives differently. It is not enough to focus on shaping the attitude among the elderly, we can achieve much greater efficiency if we start all this in childhood, in schools.
- The fourth task is related to the shift of the balance of individual and collective responsibility. Governments are unable to maintain the affordability of welfare systems, so the role of the private sector will increase significantly compared to the past, and its presence will become

key. While more flexible arrangements provide opportunities and greater influence for many in their own affairs, for others it embodies a lack of security. Individuals must believe that they will receive adequate and equitable health care, the right to lifelong learning, pensions and all such services that are necessary for their safety. Currently, this kind of trust is lacking in many states.²³

When implementing reforms, it is essential that they form a coherent whole, that they can be realized as elements of a common strategy. Otherwise, it is feared that reforms will take a different direction, making it impossible for a well-functioning welfare system to emerge.

6. The pension in the budget

Changes in the age composition of the population can have both direct and indirect effects on the budget balance. On the expenditure side, as a direct effect, pension expenditures and health care expenditures together may exceed their 2010 value by 2.8 percent of GDP in Hungary in 2060, according to the AWG forecast (EC 2012).

On the revenue side, a decline in the working-age population, with an unchanged regulatory environment and activity rate, could lead to a decline in wage-related revenues. Social security benefit systems may be under double pressure, as declining contribution revenues due to demographic trends will have to finance social security benefits with a growing number of users.

Pension expenditures are one of the largest expenditures of the central budget in Hungary. In the pay-as-you-go Hungarian pension system, the current contributions of employees primarily cover the pension of the elderly. The level of public pension expenditure depends on several factors at the same time, such as the parameters of the pension system (retirement age, length of service, replacement rate of new pensions, indexation of defined benefits) and demographic trends. European countries with higher old-age dependency rates generally have higher public pension expenditure as a share of GDP.

This also statically shows that unfavorable demographic trends (decrease in the working age population and increase in the share of people over 65) result in an increase in the pension fund deficit in the absence of measures. The aging of society points in the long run towards expenditure growth based on the decomposition of pension expenditure. According to the forecast in the AWG report, pension expenditure as a share of GDP could increase from 11.9 per cent in 2010 to 13.6 per cent in Hungary by 2060 (EC 2012), and this increase in expenditure may be slightly higher than the EU average (1.2 percentage points). The change in the old-age dependency ratio is the most significant contributor to the increase in expenditure.

The biggest demographic impact may occur in 2040, which may be caused by the retirement of the Ratkó generations. The impact of aging is partly offset by measures affecting the pension system. The retirement age will gradually increase

²³ STRÉHLI Kitti: op. cit. p. 7.

from 62 to 2014 to 65 years between 2014 and 2022. In addition to raising the age limit, tightening the use of pre-age benefits and disability benefits will also result in an increase in the effective retirement age. As a result, the ratio of pensioners and pension-like benefits to the population over the age of 65 may fall from 176 per cent in 2010 to 122 per cent by 2060 (EC 2012). The decline in the benefit ratio in 2010 could have the largest reduction in pension expenditure. The amendment to the indexation rule also supports the sustainability of the pension system: since 2012, a purely inflation-adjusted pension increase rule has been in force, according to which the usual indexation of already established benefits at the beginning of the year follows the planned inflation rate in the budget. The rule ensures that the real value of pensions is preserved, but in the case of economic growth, indexation below the rate of nominal GDP results in expenditure savings in the budget in proportion to GDP from one year to the next. Overall, from 2013 to 2014, pension expenditures may have declined by 0.6 percent of GDP due to the combined effect of measures affecting the number of employees (such as the raising of the age limit starting in 2014) and the indexation rule. According to AWG's forecast of pension expenditures, pension expenditures as a share of GDP may gradually decrease further by 2030 (to 10.4 percent of GDP by 2030), so no imbalances in the Hungarian pension system are expected in the next 20–25 years. At the same time, the impact of the aging of society on the pension system may intensify in the 2040s with the retirement of Ratkó grandchildren²⁴.

7. Final remarks

Demographic aging, i.e. the increase in the proportion of older people, is one of the defining socio-demographic phenomena in the more developed regions of the world. Whatever indicator we measure, we are witnessing an increasingly dynamic change that, according to population projections, will continue over the next few decades. In Hungary, the proportion of the population aged 65 and over increased from 13% to 19% between 1990 and 2017, and is projected to reach 29% by 2070.²⁵

The gender gap has started to narrow in the last few years. One of the most important milestones of aging is the exit from the labor market, retirement. The average age of retirees has risen significantly over the last decade and a half as a result of tightening eligibility conditions and raising the age limit, especially for women. In 2013, the average age of women retiring was 59.4 years, while that of men was 62.2. In the year before the 1997 reform of the pension system, in 1996, the value of the indicator was still 54.3 for women and 58.7 for men. The internal age composition of the elderly has also changed in recent decades. There has been an increase in the proportion and number of people aged 80 and over, that is, the very

²⁴ KREISZNÉ HUDÁK Emese – VARGA Péter – VÁRPALOTAI Viktor: A demográfiai változások makrogazdasági hatásai Magyarországon európai uniós összehasonlításban. pp. 111–114. *Hitelintézet Szemle*, 14. évf., 2. szám, 2015. június, pp. 88–127.

²⁵ MONOSTORI Judit – GRESITS Gabriella: op. cit. p. 127.

elderly. While in 1990 there were 260 thousand, in 2016 there were already 412 thousand inhabitants of this age. Due to the different mortality rates of men and women, the proportion of women is higher among the elderly. Furthermore, the older the age group, the greater the ratio shift. While 57% of people aged 65–69 and 73% of the population aged 85 and over are women. In recent decades, life expectancy has been steadily rising not only at birth, but also at age 65, which means that the life expectancy in old age is also increasing. In 2000, life expectancy at age 65 was 12.5 years for men and 16.2 years for women. In 2016, men could expect an average of 14.4 years of age and women 18.2 years of age. Increased life expectancy is accompanied by a shift in the lower age limit to a later age in several respects.

This is indicated not only by various scientific approaches, but also by the population. While in 2001 the adult population marked the lower limit of old age at an average of 65.3 years, in 2016 it was already 68.3 years. In 2016, the healthy life expectancy of men at age 65 was 6.7 years and that of women 6.4 years. Because women live longer on average than men and there is no significant difference in their life expectancy in health, women can expect to spend longer in illness than men. In 2016, 31% of the population aged 65 and over living in private households lived alone. The proportion of people living alone is higher among women, and their proportion increases with age.²⁶

²⁶ MONOSTORI Judit: *op. cit.* p. 115.