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Gyermekvállalás és nyugdíjak a visegrádi országokban

Childbearing and Pensions in the V4 Countries[4]

Tanulmányunkban korábbi, a magyar nyugdíjrendszer fenntarthatóságával kapcsolatos eredményeinkre (Németh et al. 2019) építünk, és kiterjesztjük vizsgálatunkat a Visegrádi országokra, vagyis Magyarország mellett Csehországra, Lengyelországra és Szlovákiára, miközben az előrejelzésünk időhorizontját is kitoljuk 2050-ről 2100-ra. Áttekintjük a régió országainak termékenységi, halálozási és foglalkoztatási rátáiban mutatkozó múltbeli trendeket, hasonlóságokat és különbségeket, majd az Eurostat adatai alapján előrejelzést készítünk a gazdasági időskori függőségi ráta alakulására. A demográfiai folyamatok erősen meghatározzák a vizsgált országok nyugdíjrendszereinek jövőjét, ezért azt is elemezzük, hogy a teljes termékenységi rátára vonatkozó különböző alternatív feltevések hogyan befolyásolják a függőségi ráta várható pályáját. Eredményeink azt mutatják, hogy mind a négy nyugdíjrendszer komoly fenntarthatósági problémákkal kell, hogy szembenézzen hosszú távon, melyek kezelésére parametrikus reformok önmagukban nem elegendők

In this paper, we expand on our earlier results published in Németh et al. (2019) about the sustainability of the Hungarian public pension system, and extend the scope of our analysis to the Visegrád countries of Czechia, Hungary, Poland and Slovakia, while also shifting the end of our forecasting horizon from 2050 up to 2100. We look at past trends, commonalities and differences among fertility, mortality and employment rates in the region, and use Eurostat data to forecast the economic old-age dependency ratios of the countries. Demographic events strongly determine the future of the four pension systems, therefore we also examine how different alternative assumptions about the total fertility rate affect the paths of dependency ratios. Our results show that all systems face a serious sustainability threat in the long run, which might not be completely relieved by parametric reforms.

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Introduction

The quality of pension systems is an important determinant of the well-being of employees (or in general: citizens) of a country. One of the most important factors that describe the quality of a pension system is its sustainability. A simple way to assess sustainability is by examining the long-term path of the so-called *economic old-age dependency ratio*, i.e. the *ratio of the elderly and employed populations*.[5] In an earlier article (Németh et al., 2019) we presented calculations regarding the expected path of this ratio in Hungary in the period of 2017–2050.

As a next step, we now extend our analysis in two dimensions. First, we use a *longer forecast period*, and examine what can be expected in the second half of the 21st century, as well, i.e. the timespan of our current analysis is 2018–2100.[6] Secondly, instead of concentrating only on Hungary, we widen our scope and take a look at the so-called *Visegrád countries* (or simply V4): *Czechia*, *Hungary*, *Poland*, and *Slovakia*. These countries show a significant amount of similarity regarding their economic and social structures, i.e., they can be considered a natural comparison group.

In our model, we use a simplified approach to sustainability: we concentrate on the number of people in the contribution paying and benefit recipient groups, instead of including cash-flows in the model, which would require a more sophisticated approach. The next section briefly cites some forecasts about the expected changes in the population structure of the Visegrád countries, then we describe some of their key demographic and labour market characteristics. After that, we turn to our own calculations about the expected path of the economic old-age dependency ratio. First, we describe the model we used for the forecasts, then we discuss the results, and examine how potential changes in the total fertility rate affects the estimations.

Ageing of Population in the V4 Countries

Demographic changes (including the ageing of population that directly affects the sustainability of pension systems) have been frequently analysed in the European countries. Increased life expectancy and a lower number of births are general trends in most developed countries, and they significantly reshape the age structure of the population. As Diaconu (2015, p. 50) writes, ageing population "and its consequences on the socio-economic systems will also become one of the major challenges for the European Union countries in the coming decades since the proportion of people of working age in the EU-28 is shrinking, while the relative number of those retired is expanding."

It is also important to mention that Central and Eastern European countries are expected to be more affected by demographic changes than the European average. According to the

[5] There is an important difference between the *demographic* old-age dependency ratio (frequently simply called old-age dependency ratio) and the *economic* old-age dependency ratio: the former puts the working-age population in the denominator, while the latter uses the employed population there. That is, the economic old-age dependency ratio takes into account the effects of changes in employment.

[6] We start our forecast period with 2018, because it is the last year for which we have a full set of the necessary data.

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population projections of Eurostat (2020), *population* is expected to be lower in 2100 than in 2020 in all Central and Eastern European member states. Latvia and Lithuania are expected to experience the largest loss in population (-43.3% and -39.9%, respectively), but Poland and Slovakia can also expect a much larger decrease in their population than the EU as a whole (-27.1% and -20.4% compared to the EU-27 average of -7.1%). The forecasted population trends for the other two V4 countries are significantly smoother: -10.8% for Hungary, and -4.5% for Czechia.

The Eurostat population projections also include estimations for other important demographic measures that show the huge shifts that can be expected in the population structures of European countries. One such measure is the *median age of population*. In strong connection with what we have seen regarding the size of population, Poland and Slovakia show a different picture than Hungary and Czechia. The median age of population is expected to increase by 10.2 years in Poland, and by 8.4 years in Slovakia during the 21st century, which also means that Poland is expected to have the highest median age of population in 2100 (51.5 years).[7]

Accordingly, the *demographic old-age dependency ratio* will increase most strongly in Poland (by 35.7 percentage points, from 27.5% to 63.2%) and Slovakia (by 34.6 percentage points, from 24.5% to 59.1%).[8] Dependency ratios will significantly increase in the other two V4 countries as well, but at a slower pace than in Poland and Slovakia (Hungary: 25.7 percentage points, from 30.3% to 56.0%, Czechia: 21.6 percentage points, from 31.1% to 52.7%, EU-27: 25.2 percentage points, from 32.0% to 55.1%).

The expectations of the OECD (2019, p. 175) show a similar picture on a somewhat shorter forecast horizon (the end date is 2080): the dependency ratio can be expected to more than double in Poland and Slovakia in the next six decades, while its forecasted growth rate is lower, but still quite significant in Hungary and Czechia. The OECD estimates also show that population ageing is a *global phenomenon*: very large increases can be expected in the old-age dependency ratio not just in developed countries (the EU, the US, or mostly Japan and Korea), but also in Brazil, China, India or Indonesia.

Finally, the UN (2019) also presents their forecasts of the old-age dependency ratio in specific countries and country groups. They estimate that the dependency ratio of the whole World will increase from 14.3% to 37.7% between 2020 and 2100, while that of the European continent will increase from 29.5% to 55.1%. Regarding the individual V4 countries, their expectations are fairly similar to those of the Eurostat (2020): they forecast a dependency ratio of 64.5% in Poland, 56.2% in Slovakia, 53.3% in Hungary, and 51.2% in Czechia for 2100. The UN (2019) also presents high fertility and low fertility alternative scenarios that show the importance of the number of children in the sustainability of pension systems. In the high fertility scenario, the estimated dependency ratios are 46.1% in Poland, 41.4% in Slovakia, 39.9% in Hungary,

[7] It is worth mentioning that in both countries, the median age of population is expected to peak around 2075 and start a slow decline after that. The projected change in the median age between 2020 and 2100 is 5.5 years in Hungary, 4.4 years in Czechia, and 4.9 years in the EU-27 as a whole.

[8] This also means that with 63.2%, Poland is expected to have the highest old-age dependency ratio in the EU in 2100.

and 39.7% in Czechia, while in the low-fertility scenario they are 101.9% in Poland, 83.7% in Slovakia, 76.9% in Hungary, and 69.7% in Czechia.[9]

Demographics and Labour Market in the V4 Countries

Demographic trends have a strong impact on the sustainability of a pay-as-you-go pension system. Ageing societies face a significant challenge in this regard, as the declining number of children sooner or later leads to fewer contribution payers, while increasing life expectancy increases the number of pensioners. The number of live births determines basically the number of labour force after 20 years and the number of pensioners after 65 years. That is why we have to follow up in detail the fluctuation of the number of live births in the past. Furthermore, we pay attention to the trends in life expectancy and the paths of employment rates in the recent decades.

The number of live births is determined by two factors: on the one hand by fertility, and on the other by the size of the female population in reproductive age (15 to 49 years). Fertility is measured by the *total fertility rate* (TFR), which quantifies how many children an average woman will have, if she has the given year's age-specific fertility rates[10] through her potential childbearing years. TFR decreased drastically in the 1990s in the region, while the trend reversed around 2000, and TFR was on an increasing path until the financial crisis. All four countries experienced a temporary decline in the TFR around 2010, but it has significantly increased since then.

According to several researchers, it is hard to find causality between the family policy measures used by the governments and the number of live births (Neyer et al., 2008). In the V4 countries, paid maternity and parental leave is relatively long and the average payment rate is relatively high compared to other EU countries (OECD 2020); typically, the mothers stay at home with their children for a longer time period (2 or 3 years). The crèches and family day care system is widely available only in Hungary, and there are significant tax allowances for families in Hungary and in Czechia (Kuchařová et al., 2015). Still, the Hungarian TFR is not higher than that of Poland and Slovakia, or the EU average, and it is significantly lower than the Czech fertility rate.

Women's *mean age at childbirth* is one of the most important factors behind the movements of TFR (this is the so-called tempo effect (Philipov et al., 2001, Kohler et al., 2002)). During a

[9] Although these alternative scenarios draw attention to the fact that fertility is an important determinant of the paths of dependency ratios, it is important to mention that the assumptions the UN (2019) use in these alternative forecasts are quite unrealistic. In the high fertility scenario, they assume that the total fertility rate in the 2020–2025, 2025–2030 periods, and from 2030 on is 0.25 points, 0.4 points, and 0.5 points higher than in the baseline scenario, respectively. Compared to the current (and expected) Hungarian fertility rates, this would mean approx. 30% more children per women. The low fertility scenario is exactly symmetric to the high fertility scenario. At the end of the current paper, we use more moderate (and in our opinion, more realistic) alternative assumptions to examine the role of fertility rates in the paths of the dependency ratios.

[10] Age-specific fertility rates (ASFR) show the number of live births per 1000 women in a specific age in a calendar year.

time period, when postponement of childbearing is accelerating (as we experienced in the V4 countries after the regime transition or the financial crisis), TFR is decreasing, but as a result of a slowing or ending postponement of childbearing TFR can increase again. In the last few years, mean age of women at childbirth has stabilized in Slovakia and Czechia, while it is rising in a slowing manner in Hungary and Poland.

As a consequence of these changes – together with the negative trends in the size of the female population in reproductive age since the end of the 1990s (Eurostat, 2020) –, the *number of live births* dropped strongly in the 1990s, and since 2000, it has increased significantly in Czechia, while remaining fairly stable in the other three countries. Among the V4 countries, Czechia is the only one, in which the number of live births is almost as high nowadays as it was in the early 1990s (*Figure 1*).

Figure 1: Number of live births in the V4 Countries (1990–2018, 1990=100%)
Authors' graph based on data from Eurostat (2020)

Longevity is another strong determinant of the sustainability of public pension systems: as *life expectancy* tends to rise in the long run, so does the size of the pension-aged population. As *Figure 2* shows, both female and male life expectancies at birth have increased continuously since 1990 in all four analysed countries, although expected lifespans of the region's individuals are still significantly below the EU averages. It is also worth mentioning that even the lowest female life expectancy in the region (Hungary) is more than three years higher than the highest male expected lifespan (Czechia).

All Central and Eastern European countries went through a transformational recession after the regime transition (Kornai, 1994). This recession had a serious impact on the labour market, as well; all affected countries witnessed a large decline in employment. As it can be seen on *Figure 3*, although there are significant differences in the exact paths of *employment rates*, employment in 2008 was very close to its 1998 level in all four countries. Naturally, the financial crisis affected employment negatively, but since 2010, all analysed countries have witnessed a solid growth in employment rates: 14.3 percentage points in Hungary, 9.8 percentage points in Czechia, 8.8 percentage points in Slovakia, and 8.5 percentage points in Poland. All these growth

rates are much higher than that of the EU average (4.4 percentage points); as a result, Czechia and Hungary currently have significantly higher employment rates than the European average, while Poland and Slovakia have also practically caught up to that average.

Figure 2: Life expectancy in the V4 countries (1990–2018)
Authors' graph based on data from Eurostat (2020)

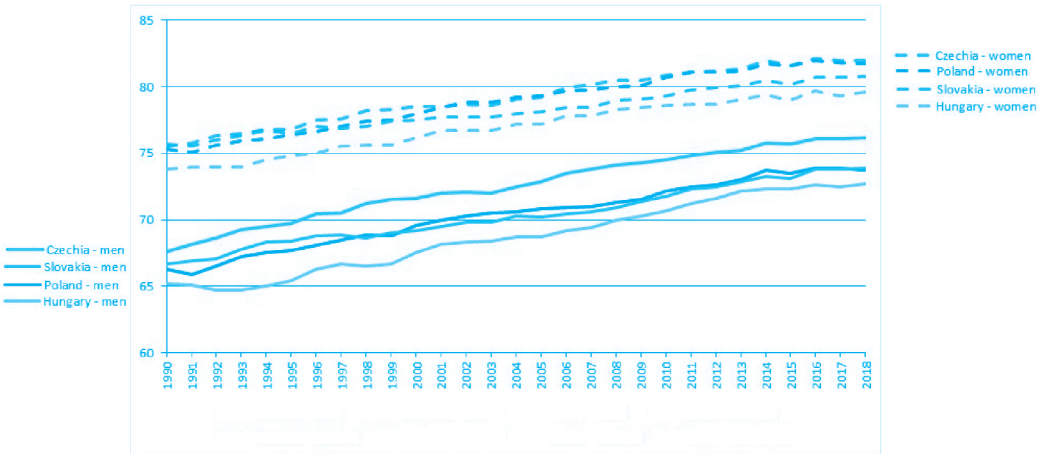
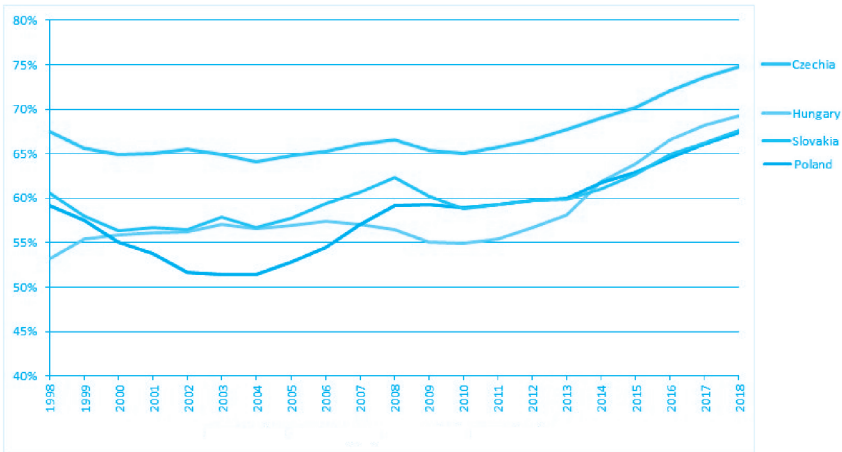


Figure 3: Employment rates of people aged 15–64 in the V4 countries (1998–2018)
Authors' graph based on data from Eurostat (2020)



The Economic Old-Age Dependency Ratio in the V4 Countries

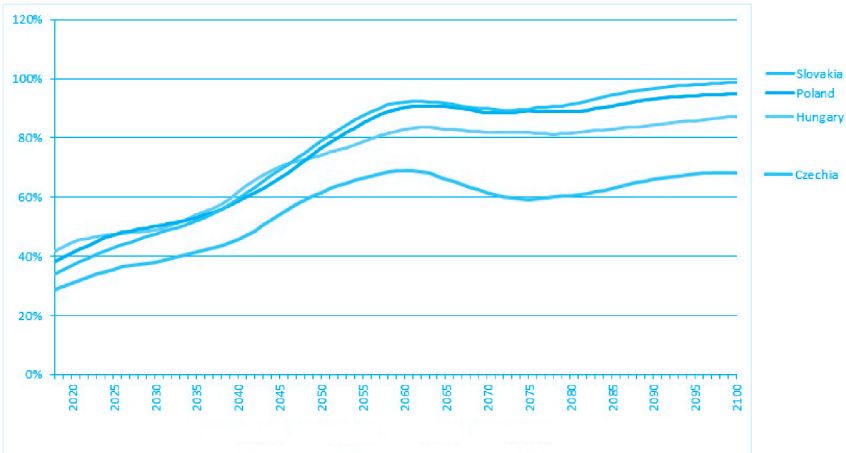
Our model calculates the *expected path of the economic old-age dependency ratio* in the period between 2018 and 2100. We calculate a baseline scenario for each country, using similar assumptions. We concentrate on three main determining factors: fertility, mortality, and

employment. This means that, following Bajkó et al. (2015), we implicitly assume net migration to be zero.

Regarding fertility and mortality rates, we use the assumed rates of the population projections of Eurostat (2020). In the case of employment, we could see an important trend in the recent period: the employment rates of the population aged 50–65 years has increased significantly relative to the younger generations. In our baseline forecast, we assume that this trend will continue in the coming years, as well. More precisely, we assume that in both genders, the employment rates of the 50–55 age group will gradually catch up to those of the population aged 45–50 by 2030, and the employment of the 55–60 and 60–65 age groups will also reach a certain percentage of them in the same time period. These exact percentages differ among countries and genders, based on the witnessed tendencies of the last decade.[11] Regarding other generations, we assume that the current (2018) employment rates will remain constant.

As the economic old-age dependency ratio is calculated as the ratio of elderly people (pension recipients) to the employed population, we have to make an assumption about the retirement age, as well. For the sake of simplicity, we use 65 years for all countries, although there are slight differences in the actual retirement ages. It is fairly certain that retirement ages have to be increased in most countries in the next decades, but in the calculation, we assume them to be constant, because we would like to forecast what could be expected based on current tendencies.

Figure 4: The projected paths of the economic old-age dependency ratio in the V4 countries
Authors' calculation



[11] The specific percentages used in the calculations for the different countries and age groups are as follows: Czechia – men (55–59): 100%, women (55–59): 100%, men (60–64): 80%, women (60–64): 60%; Hungary – men (55–59): 90%, women (55–59): 90%, men (60–64): 80%, women (60–64): 50%; Poland – men (55–59): 90%, women (55–59): 90%, men (60–64): 80%, women (60–64): 40%; Slovakia – men (55–59): 90%, women (55–59): 90%, men (60–64): 50%, women (60–64): 50%

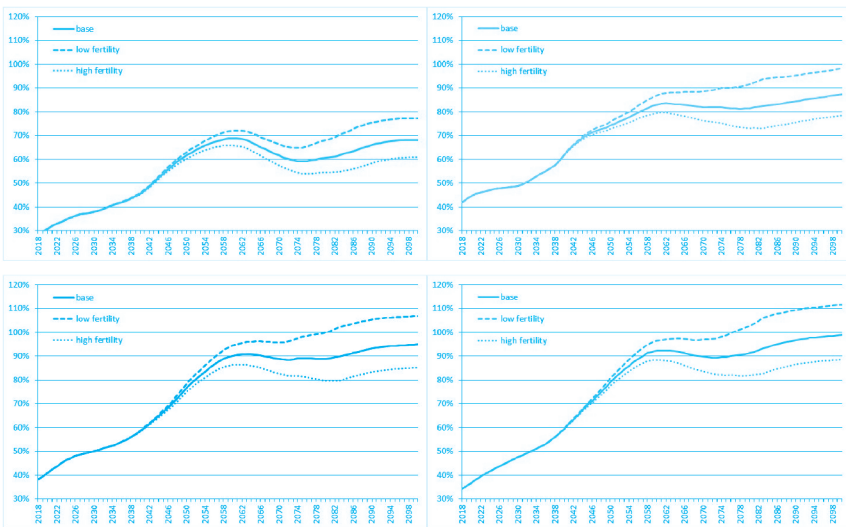
Figure 4 shows our results. We can see a similar pattern in all four countries: the dependency ratio can be expected to significantly increase until 2060 (from 28.6% to 68.9% in Czechia, from 41.9% to 83.0% in Hungary, from 38.2% to 90.2% in Poland, and from 34.2% to 92.2% in Slovakia). This means that all the pension systems in the region face a huge sustainability challenge in the foreseeable future. Even in Hungary, where the expected rate of growth is the most moderate, we can expect a doubling of the dependency ratio, and the situation is even more serious in the other three countries.[12]

Between 2060 and 2080, the dependency ratio is expected to decrease, starting to increase again only in the last two decades of the century (at a more moderate rate than in the first decades of the forecast period). This is due to the fact that the number of childbirths dropped harshly in the years after 1990, and these much smaller generations will reach retirement age around 2060. That is, after that we can expect a significant decrease in the number of pensioners.

The effect of fertility on the old-age dependency ratio

Our simplified forecasts show that there is a huge amount of determination in the system – mainly as a result of past demographic trends. We have found that the increasing trend of the economic old-age dependency ratio depends mainly on the number of live births.

Figure 5: The effect of total fertility rate on the projected paths of the economic old-age dependency ratio in the V4 countries (upper left: Czechia, upper right: Hungary, lower left: Poland, lower right: Slovakia) Authors' calculation



[12] Although the absolute value of the dependency ratio is lower in Czechia than in Hungary, its expected rate of growth is higher.

This observation motivated us to explore the *impact of different fertility scenarios* on the long-term trajectories of the economic old-age dependency ratios. We examined three different scenarios in all four countries: under the baseline scenario, live births follow the path of the forecast available in the Eurostat (2020) database, whereas under the hypothetical high and low fertility scenarios, the number of live births in every year are 10% higher or lower, respectively, than in the baseline scenario. This analysis has the additional potential to shed light on the effectiveness of family policy incentives intended to increase the number of live births. *Figure 5* demonstrates the impact of these scenarios.

According to our results, live births have a *tremendous long-run impact* on economic old-age dependency ratios: in 2100, the difference between these under the low and high fertility scenarios amounts to 16% in Czechia, 20% in Hungary, 22% in Poland and 23% in Slovakia, i.e., about half their current values. But this comes with a very important caveat: the impact of increasing fertility can only be felt in the *very long run*. There is hardly any impact before 2050, and the year that the difference between the dependency ratios under the low and high fertility scenarios first reaches 5 percentage points is 2057 in Czechia, 2055 in Hungary, 2054 in Poland and 2055 in Slovakia, a painfully large number of government terms ahead of us. This means that increasing live births is highly effective, but only in the very long run, and it requires plenty of patience and discipline. It seems that the impact is stronger in countries with more serious fertility problems such as Poland and Slovakia, as opposed to Czechia.

Conclusion

Different policy interventions such as increasing contribution rates, increasing the retirement age, etc. can decrease the growth rate of the economic old-age dependency ratio, but are not able to counterbalance its basic trend, as we can see in the case of Hungary in Németh et al. (2019). According to our results, the number of live births has significant long-run effects and consequences for the economy, and has a powerful impact on the sustainability of public pension systems, but only in the very long run, generations ahead of us. We must pay attention to these long-run effects also while considering family policy interventions.

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