

ANNEX 2. Population and labour force projections for the long term

Population and labour force trends over the long term determine economic growth potential and the sustainability of the public finance and pension system. The European Commission (EC) projects changes for these indicators, however, it only presents one scenario. Due to significant changes in emigration and labour market participation rates in recent years, it would be useful to construct additional scenarios for population and labour force dynamics.

1. Assumptions used in the projections

Population is projected by assuming trends in fertility rate, mortality rate and net migration. Labour force projections are based on assumptions of the labour market participation rate. This section discusses the assumptions made by the EC and in this annex.

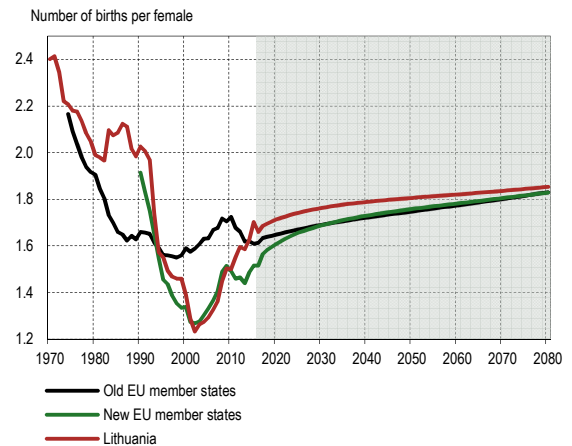
The fertility rate in Lithuania began to decline rapidly once the country regained independence (see Chart A). From 1992 to 2002, the number of new-borns per female fell from 1.97 to 1.23. However, later this number began to grow and, in 2015, reached 1.70. Trends were similar in other new EU members. The EC projects that the fertility rate in Lithuania will gradually increase and reach 1.85 in 2080. For the entire projected period (2016–2080) the fertility rate in Lithuania will be greater than fertility rates in new and old EU Member States, however, this difference will decrease in the long term.

The mortality rate in Lithuania was for a long time (from 1970 to 2007) relatively stable at 1.7 per cent. This trend stood out because mortality rates continually decreased in most old EU member states. It also differed slightly from trends in the majority of new EU members. Among most of the new members, mortality rates were quite stable up until the mid-1990s, and later began to decrease. In Lithuania, the mortality rate also began to fall, only much later, in 2008. The EC projects that the mortality rate in Lithuania will continue to decline at similar rate as in the past eight years. By the end of the projected period, i.e., 2080, it should be almost four times lower than in 2016. The gap between mortality rates in Lithuania and other EU countries should also decrease substantially.

An essential assumption in population projections is net emigration. Numbers of immigrants and emigrants may vary drastically because they are affected by cyclical economic fluctuations, immigration policy, etc. Thus, it may prove meaningful to construct an additional assumption for these indicators. The emigration of 2015–2017 should not be held up as a reference point because the rise in emigration observed over this period was not influenced by economic reasons. A tighter procedure for issuing residential permits to foreigners temporarily living in Lithuania contributed to the increase in emigration in 2015. The rise in emigration in 2016 and at the beginning of 2017 may be for the most part accounted for by the authorities' active encouragement of residents to check whether they hold any debts for their compulsory health insurance. The impact of these factors on emigration should dissipate, therefore the assumption is made that from April of 2017 emigration should decline, and in December the number of emigrants should stabilize at the level observed on average from January of 2012 to April of 2017. Despite this decline, especially high emigration at the beginning of 2017 implies that this year will be recorded as having most emigrants since 2010.

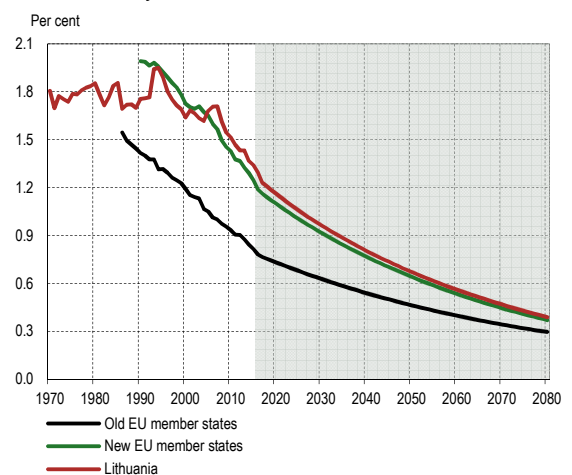
In the long term, emigration will be reduced by the narrowing of the gap between living standards in Lithuania and Western European countries. The assumption is made that in 2018, within every one-year age group, emigration levels will correspond to the

Chart A. Fertility rate



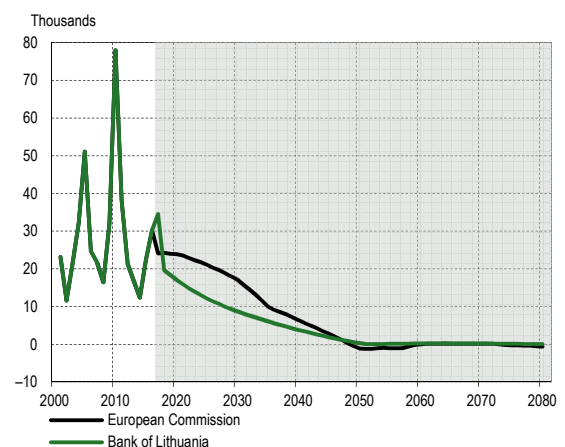
Sources: Eurostat and Bank of Lithuania calculations.
Note: dark area represents assumptions.

Chart B. Mortality rate



Sources: Eurostat and Bank of Lithuania calculations.
Note: dark area represents assumptions.

Chart C. Net emigration



Sources: Eurostat and Bank of Lithuania calculations.
Note: dark area represents assumptions.

average observed from 2011 to 2015, and in later years, it will fall annually by 2.1 per cent, i.e., at half the rate of emigration decline in 2013–2014 (during these years emigration was likely not affected by specific factors). It is assumed that in every age group spanning one year, immigration levels across the entire projected period will not change and correspond to the average of 2011–2015. Once immigration and emigration reach equal levels, the latter will no longer decrease.

Because of these trends in emigration and immigration over the period of 2018–2031, net emigration will decrease by 58.7 per cent or from 19.7 to 8.1 thousand (see Chart C). The assumptions applied by the EC are less favourable: over the said period, net emigration will decrease only by a third, and over the coming five years will not decrease at all. The EC also presents a notably higher cumulative indicator for projected net emigration. For example, based on the assumptions applied by the EC, migration will have reduced the population by 99.7 thousand more individuals in 2031 than is projected in this annex.

The projection of labour force requires assumptions about the share of population participating in the labour market, i.e., working or actively seeking employment. These assumptions are made for each five year age group. It is assumed that participation in the labour market will only change for the coming 15 years and later stabilise. These assumptions are based on two criteria: past trends in activity levels in Lithuania and activity levels in other EU countries. Three assumptions are made:

- The *first assumption* is that the activity level of younger (15–24 years old) and older (55–79 years old) residents will increase at half the rate observed in 2011–2016. The activity level of middle aged (25–54 year-old) residents has essentially been stable over the past five years, therefore projections assume no growth in this age group, with activity levels corresponding to the average observed in 2011–2016.
- The *second assumption* is that activity level differences between Lithuania and that of the three most active EU countries will decrease by half.
- The *third assumption* is based on the first two and for each age group takes the greater change in activity from first or second assumption.

The participation rate assumption that is based on past trends in that rate projects the greatest increase in participation in the older age group (see Table A). For example, activity among 60–64 year old population will increase by as much as 23.5 p.p. and amount to 77.9 per cent in 2031. Assumption based on activity levels in other EU countries projects that participation will increase most among the youngest population, for example, as many as 28.9 per cent from the 15–19 year-old category will participate in the labour market.

2. Population and labour force projections

In the long term, trends in the working-age population and the labour force are important to economic growth potential. The ratio between elderly and working-age populations or the ratio between the number of retirees and the labour force has an impact on the sustainability of public finances and the pension system.

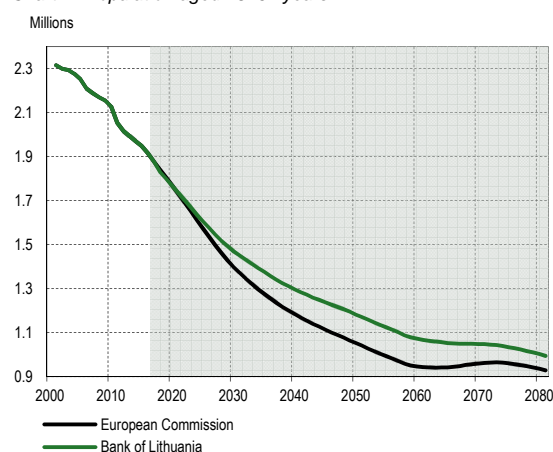
The working-age population will rapidly decline up to 2060, at which point it will stabilise (see Chart D). The EC projects that up to 2060, the number of working-age individuals will decline from 1.88 to 0.95 million, or by 50 per cent. The assumptions laid out in this Annex to the Lithuanian Economic Review imply that the working-age population will fall to

Table A. Assumptions about population activity levels

Age group	Activity level 2016 (%)	Assumed change in activity level over the next 15 years (p.p.)		
		Activity level rises at half the rate of the previous five years	Activity level differences between Lithuania and three most active EU countries decreases by half	Combination of earlier assumptions: applying greater change in activity level
15–19	6.9	3.9	22.0	22.0
20–24	59.1	11.7	8.0	11.7
25–29	89.7	–0.6	0.0	0.0
30–34	89.8	0.9	1.2	1.2
35–39	90.2	0.4	1.5	1.5
40–44	90.1	0.6	1.7	1.7
45–49	88.3	1.2	2.3	2.3
50–54	88.3	–1.3	1.0	1.0
55–59	82.3	4.7	1.1	4.7
60–64	54.4	23.5	3.5	23.5
65–69	19.5	9.8	2.6	9.8
70–74	6.5	2.7	4.0	4.0
75–79	5.9	3.3	2.4	3.3

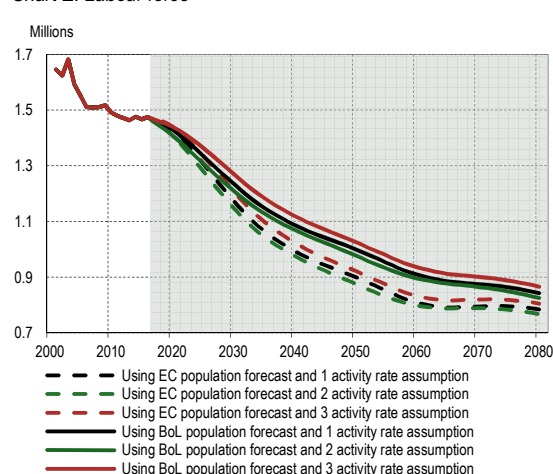
Sources: Eurostat and Bank of Lithuania calculations.

Chart D. Population aged 15–64 years



Sources: Eurostat and Bank of Lithuania calculations.
Note: dark area represents forecasts.

Chart E. Labour force



Sources: Eurostat and Bank of Lithuania calculations.
Note: dark area represents forecasts.

1.07 million or 43 per cent. The most rapid decline will take effect in the coming ten years: according to the EC, at an annual rate of 2.2 per cent, and according to the assumptions laid out in this annex – at a rate of 1.8 per cent. Over the later three decades, the annual rate of decline will slow down to 1.1 per cent (according to the EC) and to 0.81 per cent (according to this analysis).

Projections foresee the labour force rapidly declining up to 2060, after which it will essentially remain stable (see Chart E). If the EC's projections for population are applied, the labour force should decrease from 1.48 million to around 0.81 million by 2060 – about 45 per cent. According to the population projections of this annex, the labour force should decrease to around 0.91 million, i.e., by 38 per cent. Application of various participation rate assumptions does not lead significant differences labour force projections (the largest difference is 2.5 p.p.). The labour force will experience its most rapid rate of decline from 2023 to 2034. Based on the EC's projections for population, the labour force will shrink by about 2.0 per cent annually during this period, and based on this analysis, by about 1.5 per cent. Later, the rate of annual decline will slow down and in 2045 reach 1.0 per cent (according to the EC's population projections) or 0.8 per cent (according to this analysis).

The old-age dependency ratio⁹ indicates the number of elderly people ten individuals of working age have to support. Projections see this number rising until 2060, i.e., working-age will have to support increasingly larger numbers of the elderly (see Chart F). The EC estimates that this number will increase by more than a factor of 2, i.e., from 2.9 to 6.4, while the analysis laid out in this annex projects an increase up to 5.9. However, this indicator does not fully reflect the burden that falls on the public finance and pensions system. It is based on the assumption that the participation rate of working-age population and retirement age are not changing.

A more accurate indicator is the ratio of retirees to labour force. Up to 2016, this ratio was relatively stable and equalled 4.3 – there were many retirees for every ten labour market participants (see Chart G). This ratio was stabilised in part by the retirement age increases and rising labour market participation rate. However, projections see that from 2020 to 2040, the ratio between retirees and the labour force will increase rapidly and equal 6.4 by the end of the said period (assuming the population projections of this annex and the third activity rate assumption). In later years, this ratio will be relatively stable. These calculations are based on the assumption that up to 2026 the retirement age will reach 65 and will no longer increase. If retirement age is increased by 2 months every year from 2026 until it reaches 70 years (in 2062), then the ratio of retirees and labour force would increase less drastically – to 5.4 – in 2040 and later remain relatively stable.

Chart F. Old-age dependency ratio

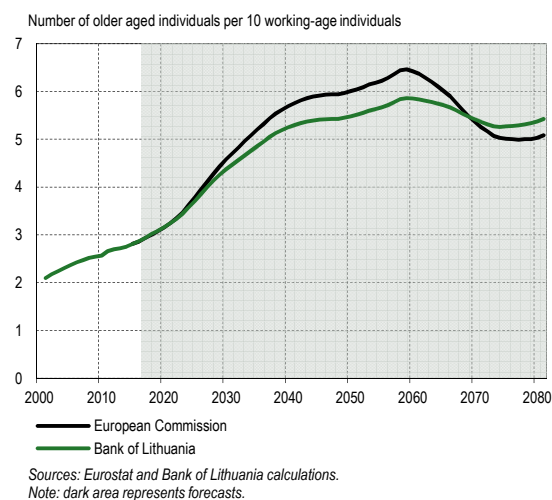
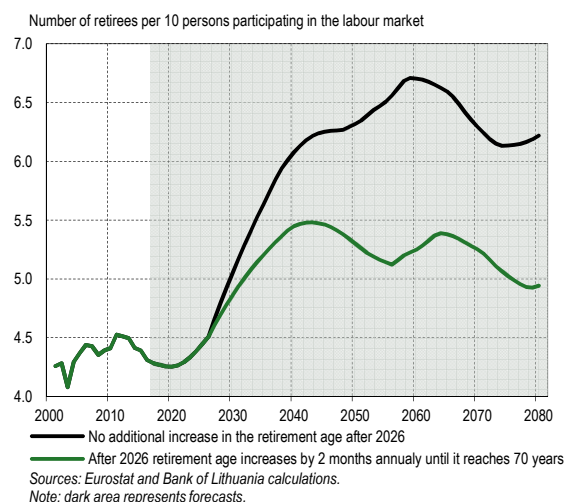


Chart G. Number of retirees to labour force ratio



⁹ Working-age: 15–64; elderly age: 65 and older.