Migration and the sustainability of the Finnish pension system: scenario calculations

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Abstract

The Finnish population is ageing rapidly as a result of increasing life expectancy and declining fertility. The bulk of pensions currently in payment are paid for by people who are in employment. If population trends continue at the current rate, it is projected that pension contributions will rise by around six percentage points by 2085.

In 2017 nearly seven per cent of Finland's population of 5.5 million were born abroad, and net immigration totalled around 15,000 persons. Most migrants moving to Finland each year are either of working age or children, and therefore immigration reduces the old-age dependency ratio. Furthermore, some migrant groups have considerably higher birth rates than people born in Finland, which means that immigration from these groups particularly contributes to a younger age structure. A younger age structure lowers the ratio of pension expenditure and pension contributions to wages. The magnitude of the effect depends on migrants' and their descendants' employment rates.

This research uses scenario calculations to assess the impact of migration on pension expenditure and pension contributions. Migrants are classified into three groups based on their country of birth: high, medium and low employment outcome. It is assumed that the length of time spent in the country correlates positively with employment outcome and that second-generation immigrants have better employment outcomes than their parents. These assumptions are based on historical data from administrative registers.

An increase in net immigration will ease the upward pressure on pension contribution rates the more the larger the share of additional immigration from high employment outcome groups. In the longer term this effect will be less dependent on the immigrant group. An increase of 10,000 persons in net immigration would reduce the upward pressure on pension contributions by around two percentage points in the long term. A decrease in net immigration would increase that pressure accordingly.

On average the pensions of immigrants are lower than those paid to people born in Finland. In scenarios that predict an increase in net immigration, the ratio of average pensions to average earnings is lower than in the baseline projection.

Contents

1 Introduction

Finland's population is set to age rapidly in the coming years. Life expectancy has been rising and the birth rate decreasing for some time. The share of older people in the population has grown, and the share of children and young people has declined. If mortality continues to fall at the same rate as in previous years and if migration remains at current levels, the old-age dependency ratio will continue to rise. This trend would not be immediately halted even if the birth rate were to rise sharply going forward, but it would take years to slow down significantly.

In Finland the bulk of pensions currently in payment are paid for by people who are working, which is why the decreasing number of people of working age coupled with the increasing number of people of retirement age is causing sustainability problems. Finnish earnings-related pension legislation currently provides for two mechanisms of automatic adjustment to changes in the level of mortality. The effects of rising life expectancy on pension levels are adjusted through the life expectancy coefficient, and the earliest age of eligibility for old-age retirement is tied to changes in life expectancy. Pension benefits, on the other hand, are not automatically adjusted for reductions in workforce numbers.

The Finnish Centre for Pensions 2019 long-term projections (*PTS19*) *[Tikanmäki et al. (2019)]* and the correction published to those projections *[Reipas (2019)]* are based on Statistics Finland's 2018 projection for population growth *[Statistics Finland (2018)]*. The projected total fertility rate is 1.45 children per woman, and annual net immigration is estimated at 15,000 persons. These assumptions are based on historical data for the past few years. According to PTS19, the contribution rate under the Employees Pensions Act will have to be significantly raised in the latter half of the century in response to rising pension expenditure caused by population ageing.

Most migrants moving to Finland are either of working age or children, and therefore immigration has the effect of reducing the old-age dependency ratio. Furthermore, the birth rate in some groups of immigrants is up to twice as high as in the total population, which means that immigration from these groups contributes to a younger population age structure.

This paper summarises a report *[Nopola (2019)]* which explores the impact of immigration on the population age structure, employment, pension expenditure, pension contributions and benefit levels in Finland. Other impacts such as the overall effects of immigration on social security expenditure and fiscal sustainability are excluded from the report, even though the latter may indirectly affect the pension system.

Immigrant groups differ markedly in terms of their employment outcomes. In order to find out how immigrants with different employment outcomes impact on the financing of pensions, they are grouped here into three categories based on the average rate of employment for immigrants coming from the same country of birth. Immigrants in the first group are born in countries whose migrants, on average, have high employment outcomes; the second group come from countries whose migrants typically have medium employment outcomes; and the third group come from countries whose migrants tend to have low employment outcomes. This classification is based on the Human Development Index (HDI)[1] because there is a discernible association between a country's HDI score and the employment rate of migrants from that country.

The differences between immigrant groups in terms of employment, earnings levels, emigration propensities and fertility rates and the positive association between length of residence in the country and employment and earnings level are based on register data.

[1] *The Human Development Index* (HDI) measures the standard of living in countries based on life expectancy, education and income *[UNDP (2018)]*.

Sufficient statistical data was not available on the employment, fertility rate, earnings levels and migration of immigrants' descendants. Calculations were therefore performed on the assumption that in terms of their employment, earnings levels, emigration propensity and fertility rate, immigrants' children stand halfway between their parental immigrant group and other native-borns. As for immigrants' grandchildren, the assumption is that they will have integrated to such an extent that they share one-quarter of their features in common with people born in their grandparents' country of birth and three-quarters with other native-borns. However, immigrants' grandchildren have only limited impact on the projections, which cover a period of around 65 years.

The report explores different migration scenarios in order to gauge the impact of migration on Finland's statutory pension expenditure and pension contributions. The scenarios have been chosen with a specific view to demonstrating the impact of immigration on various parameters. The choices are not in any way intended as statements on the likelihood or desirability of these scenarios materialising. The assumptions concerning employment, earnings levels and fertility are based as far as possible on historical data for earlier years. These data are drawn from administrative registers.

Chapter 2 describes the Finnish population structure and factors impacting its development, that is, the fertility rate, mortality and migration. The chapter also looks at how foreign-born residents impact on the population structure.

Chapter 3 classifies persons born outside of Finland into three groups based on their country of birth. It describes the employment outcomes, earnings levels and retirement in these groups on average and explores the associations between length of residence in the country and earnings levels. Furthermore, Chapter 3 addresses the impact of different immigrant groups on the population structure.

Chapter 4 explains the assumptions used in the projections of population trends and the development of employment and earnings levels, and introduces the alternative migration scenarios.

Chapter 5 presents the results of the projections: the impacts of migration on the population structure, on the total number of persons employed and the employment rate, earnings levels, number of pension recipients, sum of earned income, benefit levels, pension expenditure and pension contribution rates.

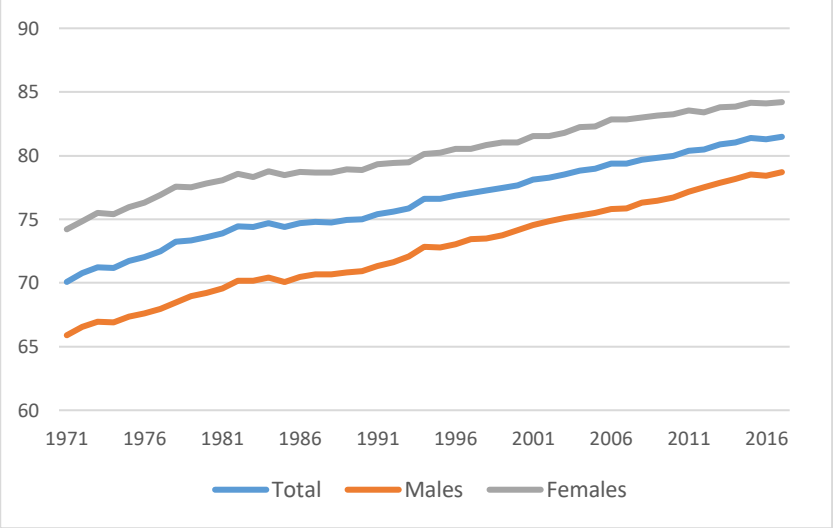
2 Impact of migration on the population structure

2.1 Demographic trends

Finland's population is set to age rapidly in the coming years. Life expectancy has continued to rise for some time (Figure 2.1.1), and the fertility rate (Figure 2.1.2) has been declining for a full decade. The share of older people in the population has grown, and the share of children and younger people has decreased. At the moment the largest age groups are those between 50 and 70 years. The old-age dependency ratio, that is, the number of people aged 65 or over compared to those of working age, has increased almost every year since the 1950s, and this trend has accelerated in the 2010s. If current demographic trends continue, the old-age dependency ratio can be expected to continue to rise.

Even if the birth rate were to rise in the near future, the population will continue to age for years to come. The total fertility rate,[2] or the average number of children that a women is expected to have in her lifetime, has fallen sharply in recent years (Figure 2.1.2). Statistics Finland's population change data indicate that the birth rate in 2018 fell for an eighth consecutive year, dropping to a national all-time low of 1.41 children. It is projected that the total fertility rate for 2019 will be lower still *[Statistics Finland (2019)]*.

***Figure 2.1.1** Life expectancy at birth in 1971–2017*



Source: Statistics Finland

***Figure 2.1.2** Total fertility rate in 1918–2018*

Source: Statistics Finland

2.2 Persons born outside of Finland

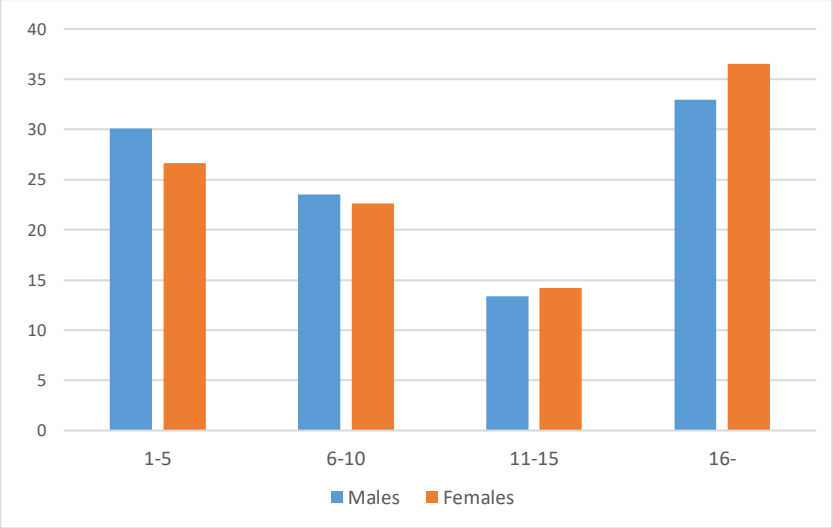
Without positive net immigration, the old-age dependency ratio would be higher still. Immigration contributes to a younger age structure because immigrants are for the most part of working age or children. Moreover, immigrants often have a higher fertility rate than native-borns.

[2] *The total fertility rate (or fertility rate)* is the average number of children that women are expected to have in their lifetime. The estimate assumes that women of each age will have the same number of children as women of the corresponding age had at the time that the estimate was made.

Immigration into Finland has run at a higher level than emigration from the country since 1981. Emigration among native-born Finns has exceeded levels of return migration since 1991. Positive net immigration therefore consists of persons born outside of Finland.

The share of foreign-born persons in the total population has increased from just over one per cent in 1990 to 7 per cent in 2018. The majority of foreign-born persons are of working age. One-third of the immigrants residing in Finland in 2017 had spent more than 15 years in the country (Figure 2.2.1).

Figure 2.2.1 *Breakdown of average length of residence in Finland among foreign-born persons in 2017, per cent of all foreign-born persons by gender.*



Source: Statistics Finland

3 Immigrant groups

3.1 Employment outcomes and earnings level of immigrants

There are marked differences in employment outcomes between men and women and between immigrant groups. Earlier studies on immigrant employment in Finland, including *[Nieminen et al. (2014)]* and *[Busk et al. (2016)]*, have shown that employment outcomes are affected by such factors as reason for immigration, educational level, language skills, mother tongue, age at time of immigration and time spent in the country. In addition, immigrants' employment prospects depend on the labour market structure and the cyclical environment. The impacts are different for different immigrant groups.

[Krieger (2014)] suggests that the positive fiscal impacts of immigration on the host economy increase in direct proportion to the number of skilled immigrants entering the country, finding a suitable job and not displacing native workers. It is possible that in the short term the arrival of highly skilled immigrants – if the influx of immigrants is very high – will have the effect of lowering the employment rate and earnings level of local people. In the long run, however, the evidence from *[Krieger (2014)]*, *[Woetzel et al. (2016)]* and *[Päivinen (2017)]* suggests that immigration does not impact on the employment or earnings of the native population.

Unskilled workers may also have a positive impact on the host country's economy *[Razin, Sadka (1999)]*, unless they make large demands on the welfare state in the form of transfer payments and public services *[Rowthorn (2008)]*.

[Krieger (2014)] observes that people migrating for employment and highly skilled immigrants have high rates of employment, but that it is difficult to attract high-skilled immigrants. Highly educated and skilled immigrants are internationally mobile, their number is limited and they easily integrate into local societies and labour markets. They are in very high demand in the labour market.

A recent report *[Lowén (2017)]* on the impacts of migration on Swedish state pension expenditure groups immigrants into seven categories based on country of birth but focuses specifically on those groups where immigrants are born in medium or low HDI countries outside of Europe. It is thought that persons born in these countries have a greater impact on Swedish state expenditure on basic income security than other immigrant groups because it is harder for them to find employment in Sweden. The report observes that people born in these countries have moved to Sweden primarily for humanitarian and family reasons.

For the purposes of this paper, immigrants into Finland were divided into groups based on their employment outcomes in order to assess their employment prospects and thereby their impact on pension expenditure and pension contributions. Although there is a close association between reason for immigration and employment rate, comprehensive data on these items are not directly available from existing register sources.

For reasons of data availability, the choice was made to focus on the associations between country of birth and employment rate. As some countries of origin contribute only small numbers of migrants to Finland, it was necessary to have some country classification. Following *[Lowén (2017)]*, the decision was made to classify countries of migration origin on the basis of HDI. When immigrants' countries of birth were examined by HDI category, it was discovered that employment rates tend to rise in tandem with the country of origin's HDI.

The index is *very high* if it is over 0.800; *high* if it is 0.700–0.800; *medium* if it is 0.550–0.699; and *low* if it is 0.549 or less. An examination of historical employment rates showed that people born in high and medium HDI countries hardly differed in terms of employment rates, but there were marked differences between other country categories. Based on their country of birth, immigrants were divided into three groups as follows:

Group 1: Immigrants with high employment outcomes
Group 2: Immigrants with medium employment outcomes
Group 3: Immigrants with low employment outcomes

This classification is created by allocating to group 1 mainly those immigrants born in very high HDI countries; to group 2 those immigrants born in high and medium HDI countries; and to group 3 those immigrants born in low HDI countries. For some countries, however, observed employment outcomes differ from their HDI classification and therefore some category changes have been made. The country-of-birth classification used to define the three immigrant groups is attached as Annex 1.

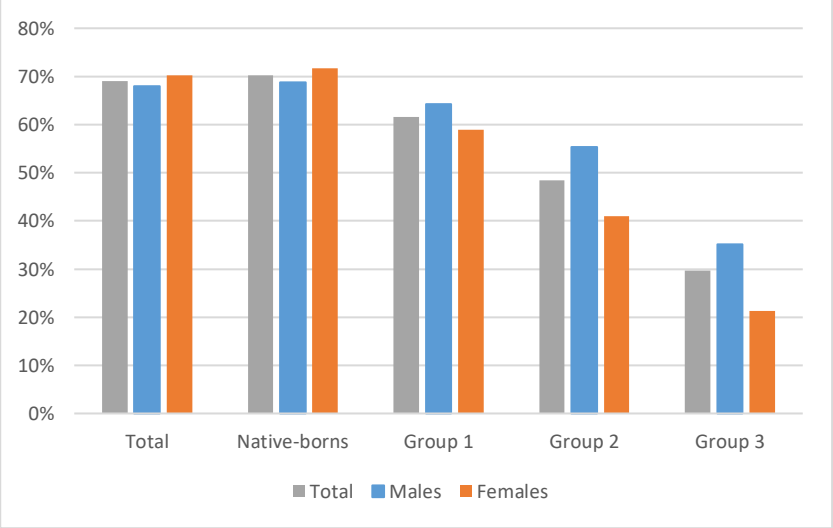
The employment probabilities of immigrants originating from individual countries will doubtless change in one way or another in the future. The main purpose of the calculation is to demonstrate that immigrants' average employment rate is indeed relevant.

Cyclical fluctuations have a greater impact on immigrant employment than on native employment [*Busk et al. (2016)*]. In order not to overemphasise the impact of cyclical effects but also not to ignore them altogether, employment rates are here calculated as averages for 2008–2017. Figure 3.1.1 shows the average employment rates for the three immigrant groups in 2008–2017. It is interesting to note some significant gender differences.

Immigrants have lower earnings levels than native-born persons (Figure 3.1.2). It is noteworthy that comparisons of average earnings are based on annual data. As immigrants tend to work shorter spells, this may have the effect of lowering their average earnings.

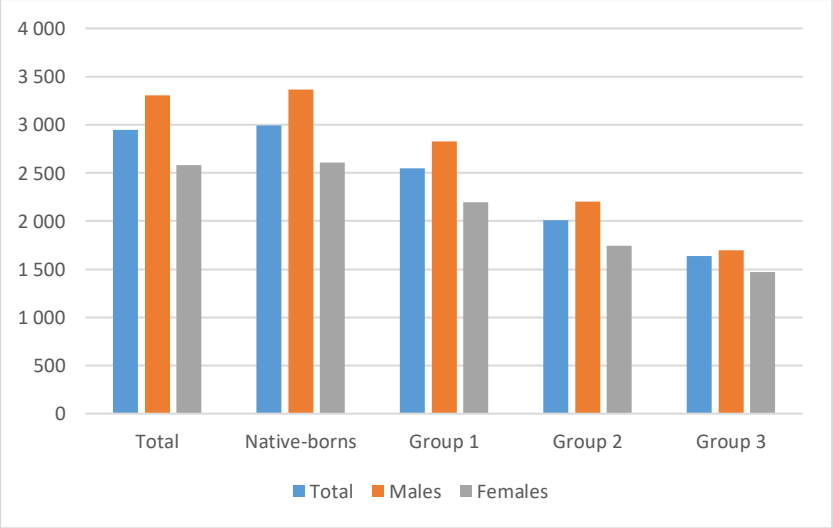
The associations of employment rate and earnings level with length of residence in the country are discussed in section 3.2. below. The employment rates shown in Figure 3.1.1 and the average earnings shown in Figure 3.1.2 are 2008–2017 averages for all people in each immigrant group. When time spent in the country is taken into account, average employment rates and average earnings are also affected.

Figure 3.1.1 *Employment rates for native-borns and immigrants aged 18-64, average for 2008–2017*



Source: Statistics Finland employment statistics

Figure 3.1.2 *Average monthly earnings of employed native-born and immigrant workers aged 18–64 in 2017*



Source: Finnish Centre for Pensions

3.2 Association of length of residence in country with employment and earnings level

[*Woetzel et al. (2016)*] and [*Busk et al. (2016)*] report that it is harder for immigrants to find employment than it is for native-borns because they are often unfamiliar with the culture, local customs and language. Employment prospects improve with time spent in the country.

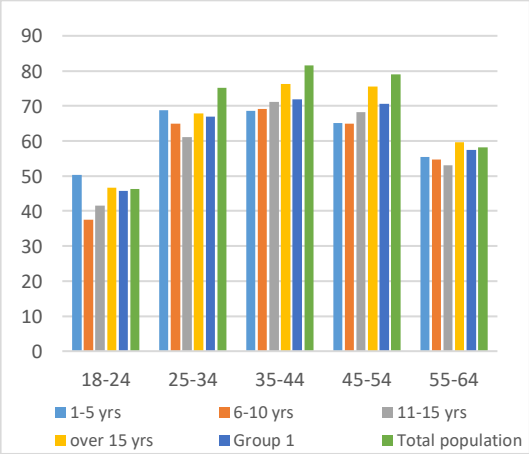
The association of time spent in the country with employment outcomes is clearly more significant for women than for men, but men's employment rate is initially clearly higher than women's. *[Päivinen (2017)]* observes that one reason for the low employment of women with a foreign background is their early family formation, and that this is why it is important to give more focus to improving their labour market position in the future.

[Päivinen (2017)] discusses various integration measures aimed at improving immigrant employment. From a fiscal point of view these integration efforts can be viewed as an investment because the sooner the immigrant completes integration training and transitions into employment, the sooner their beneficial fiscal impacts will materialise. Successful integration in terms of employment, education, health care and housing will also have knock-on effects on the use of social security and on the integration of immigrants' descendants.

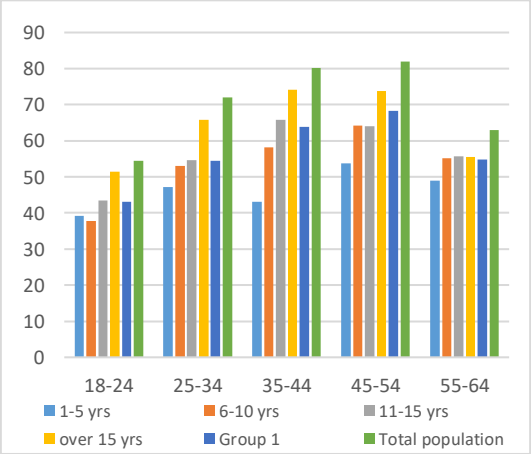
The series of figures below (3.2.1) examines the associations of length of residence in the country with employment in different immigrant groups by age group and separately for women and men in 2017. For comparison, the figures also show each immigrant group's average employment rate and the total population employment rate for five age groups. The data are based on Statistics Finland's employment statistics.

Figure 3.2.1 *Employment rate for foreign-born persons by age group and time spent in the country and on average in 2017; comparison shown for total population employment rate by gender and age group in 2017 (%)*

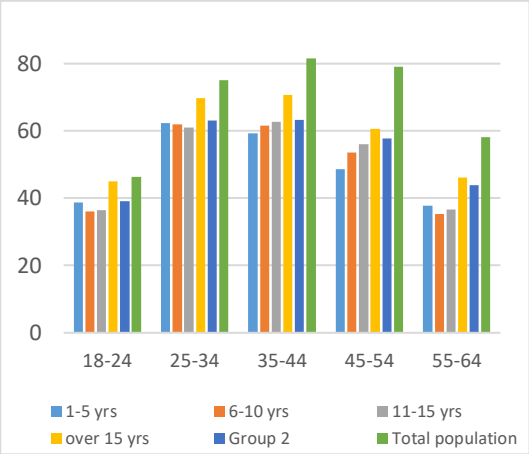
(a) men in group 1 and total population



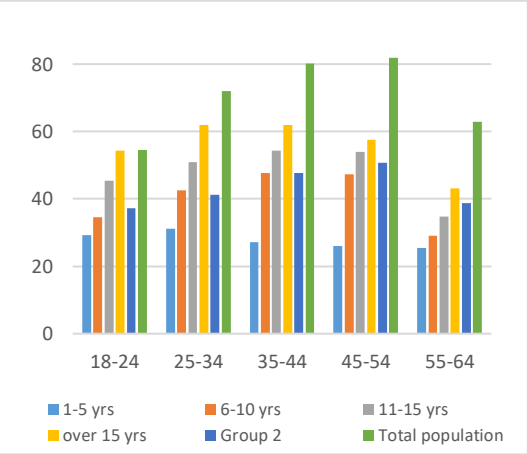
(b) women in group 1 and total population



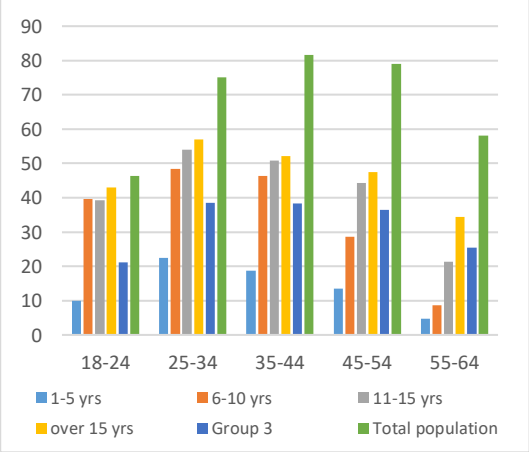
(c) men in group 2 and total population



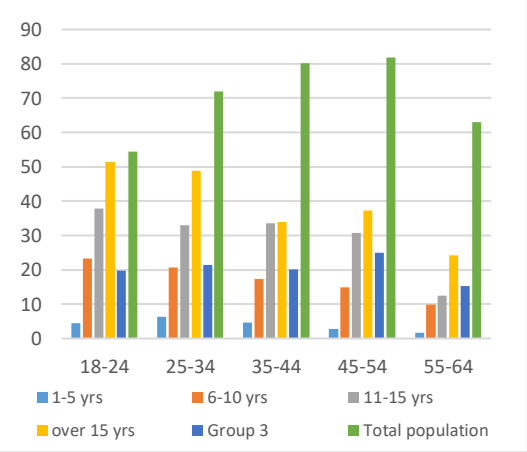
(d) women in group 2 and total population



(e) men in group 3 and total population



(f) women in group 3 and total population



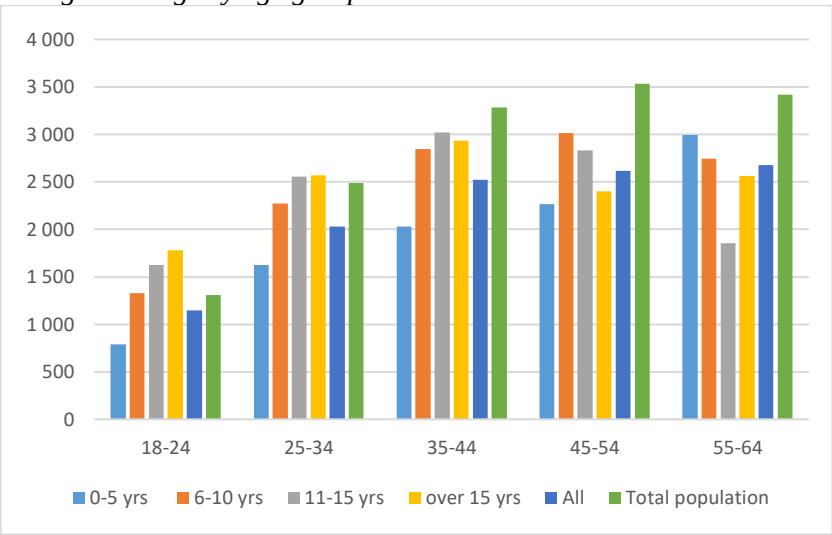
Source: Statistics Finland employment statistics

As a rule, the association of time spent in the country with employment outcomes is positive in all immigrant groups. The association is more significant for women than for men in all groups. In groups 1 and 2, i.e. those with high and medium employment outcomes, young men who have spent less than six years in the country have better employment outcomes than those who have been in the country for 6–15 years. In group 1 the employment rates come close to those for the total population.

The employment outcomes for those who moved into the country as children and for those who have spent 16 years or more in the country show very little difference by country of birth. In the age group over 54, the association between employment and time spent in the country is not as significant as in younger age groups.

Time spent in the country also shows a positive association with average earnings (Figure 3.2.2). Average earnings here refer to the average annual earnings in 2017 of foreign-born persons who were employed at year-end 2017.

Figure 3.2.2 *Average monthly earnings (euros) of foreign-born persons by age group and time spent in the country and on average in 2017; comparison shown for total population average earnings by age group in 2017*

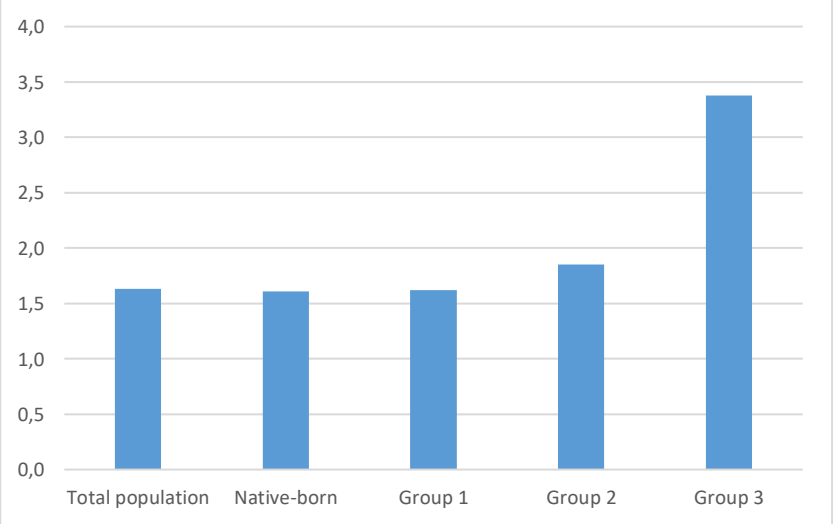


Sources: Finnish Centre for Pensions and Pellervo Economic Research Institute

3.3 Impact of immigrant groups on population structure

There are marked differences between immigrant groups not only in employment outcomes but also in fertility rate. The total fertility rate for group 1 immigrants is around the same level as for native-borns, whereas group 3 immigrants have a considerably higher fertility rate (Figure 3.3.1).

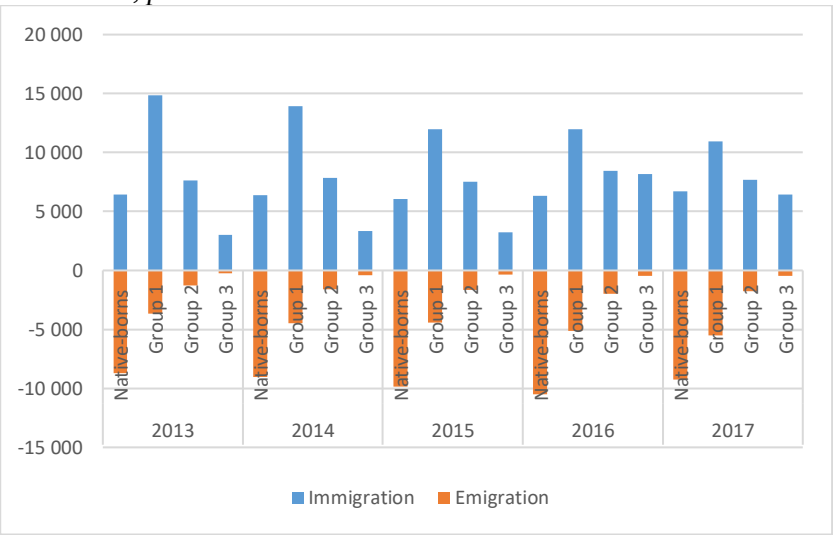
Figure 3.3.1 *Average total fertility rate in different groups in 2013–2017*



Source: Statistics Finland

Group 1 has accounted for the largest share of net immigration with the exception of 2016 and 2017, when net immigration from group 3 overtook group 1 (Figure 3.3.2). Immigration was still highest from group 1 in these last two years, but emigration from this group is also high. In numerical terms, migration levels are highest among native-borns, and their emigration rate is higher than their rate of return migration. However, emigration relative to population is higher among foreign-born than native-born persons. The probability of emigration is highest in group 1.

Figure 3.3.2 *Immigration and emigration among native-borns and immigrant groups in 2013–2017, persons*

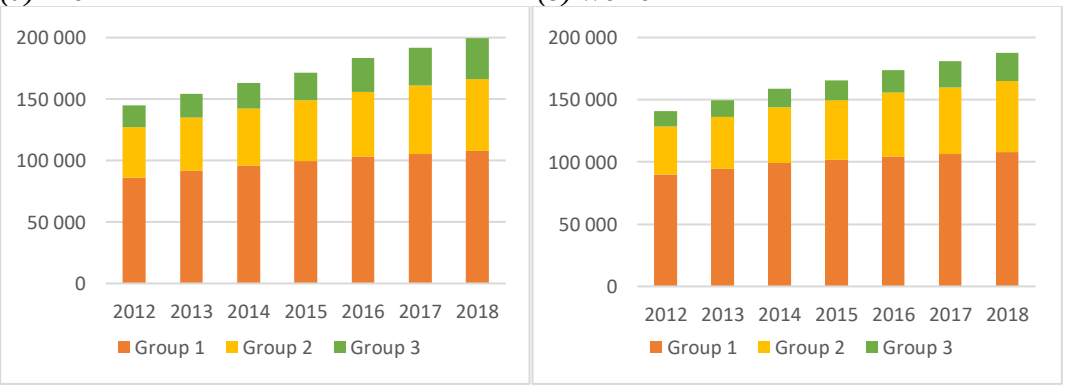


Source: Statistics Finland

Immigrants with high employment outcomes in group 1 account for the largest share of foreign-born persons in the population, but in recent years the number of immigrants from other groups has also increased (Figure 3.3.3 (a) and (b)). In group 3 men outnumber women, in other groups there is no noticeable gender difference (Figure 3.3.4).

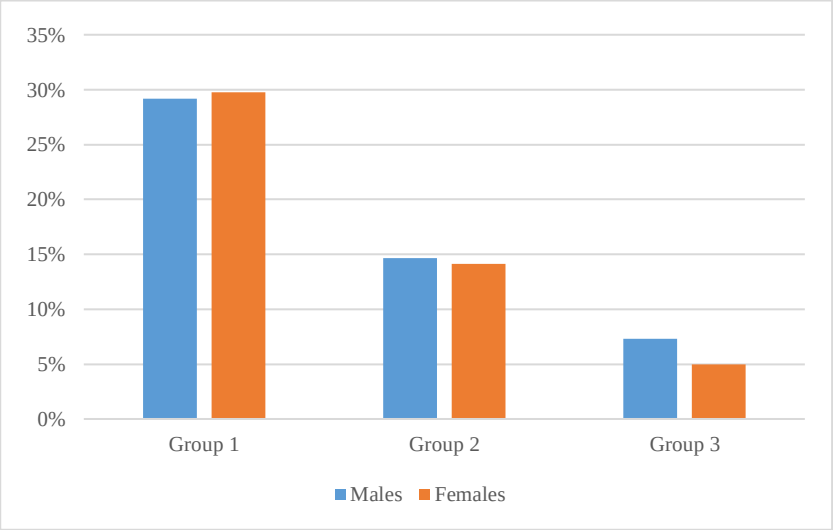
Figure 3.3.3 *Number of foreign-born persons resident in Finland in 2012–2018 by country of birth category*

(a) Men *(b) Women*



Source: Statistics Finland

Figure 3.3.4 *Group and gender shares of all foreign-born persons resident in Finland in 2012–2018 on average*



Source: Statistics Finland

4 Projection assumptions and scenarios

This report assesses the impact of immigration into Finland on the population structure, employment, pension expenditure, pension contributions and benefit levels. These assessments have required a set of assumptions about future demographic trends, employment outcomes and earnings levels in different immigrant groups. These assumptions are based on statistical data for past years and on future migration scenarios.

4.1 Total fertility rate and mortality

It is assumed that the relative differences in total fertility rates between native-born and immigrant groups will remain unchanged from the 2013–2017 average throughout the projection period (Figure 3.3.1). Total fertility rates have been scaled to correspond with the population-level assumption of 1.45 at the start of the projection period.

4.2 Mortality

It is assumed that mortality by age group and gender will be unchanged in all immigrant groups, and that it will decline in the same way as in the total population according to Statistics Finland's 2018 population projection.

4.3 Employment

Immigrants' employment rate by group and time spent in the country is determined by age group and by gender in relation to the average annual employment rate for the total population. The assumptions concerning the associations of immigrant group and time spent in the country with employment rate relative to the total population employment rate are based on 2017 data (Figure 3.2.1). Technically, the lower employment rate for immigrants is achieved by increasing the number of persons outside the labour force. The same long-term unemployment rate of 7.9 per cent is applied to immigrants as is used for the total population in the Finnish Centre for Pensions PTS19 report *[Tikanmäki et al. (2019)]*.

4.4 Earnings level

It is assumed that earnings level is associated with immigrant group and time spent in the country in the same way as in 2017 (Figures 3.1.2 and 3.2.2). Average earnings are adjusted annually by the index of wage and salary earnings. The association of time spent in the country with average earnings is considered separately in the projections for each age group, but the impact for men and women and for all immigrant groups is similar. This is because of the lack of access to sufficiently accurate data on the association of time spent in the country with average earnings by immigrant group and by gender.

4.5 Retirement rate

As most immigrants living in Finland today are of working age or younger, statistical data about their old-age retirement behaviour is still too scarce to produce reliable forecasts for the future. For the projections here, immigrants' old-age retirement rate was assumed not to differ from the rates for native-born persons of the same age. The old-age retirement rates follow the assumptions used in *[Tikanmäki et al. (2019)]*.

In Sweden, immigrants were 1.5 times more likely to retire early than native-borns in 2004–2014 *[Johansson et al. (2018)].* The Finnish data point in a different direction in that immigrants had a lower number of starting disability pensions in 2013–2017 than native-borns. High-volume immigration is a more recent phenomenon in Finland than in Sweden, and therefore the effects from persons who have spent long periods in the country are not yet visible. Furthermore, selection among persons who have recently moved into Finland probably impacts upon work capacity. As the materials available showed effects running in different directions, this report makes the assumption that immigrants' disability retirement rate does not differ from the corresponding rate for native-borns. The disability retirement rate follows the assumptions used in *[Tikanmäki et al. (2019)]*.

Persons who have earned no or only a small earnings-related pension will receive a national and/or guarantee pension. It is assumed that the number of pension recipients relative to the total population is the same by age group and by gender as it is in the baseline projection. In other words, the lower the number of earnings-related pension recipients relative to each population age band, the higher the proportion of people in that age band who receive only a national or guarantee pension.

4.6 Immigrants' descendants

It is assumed that in terms of employment, earnings level, emigration propensity and fertility rate, immigrants' children share one-half of their characteristics in common with native-borns and one-half with persons born in their parental country of birth.

4.7 Migration

Statistics Finland's 2019 population projection puts annual net immigration at 15,000 persons. This assumption is used in the baseline projection here, with the breakdown between native-borns and immigrants corresponding to the average for 2013–2017. Emigration propensity depends on age, gender and on immigrant group, as in 2013–2017 on average.

The impact of migration is assessed using scenario projections. Four of the scenarios assume that net immigration will be higher than the baseline projection, with immigration increasing in the various immigrant groups. One scenario assumes that net immigration will be lower than the baseline projection and one that net immigration will increase as a result of decreasing emigration. The scenarios have been chosen with a specific view to demonstrating differences with the baseline projection.

The projected volume of immigration is calculated based on the difference between net immigration and emigration.

Scenario 1.1. Annual net immigration is 25,000 persons in 2020–2085, or 10,000 higher than in the baseline projection due to increased immigration. This additional immigration is divided between groups 1–3 in the same was as in 2013–2017 on average. Emigration propensity is unchanged at baseline level.

Scenario 1.2 Annual net immigration is 5,000 persons in 2020–2085, or 10,000 less than in the baseline projection. Immigration from groups 1–3 decreases correspondingly to the increase in scenario 1.1. Emigration propensity unchanged at baseline level.

Scenario 2.1 Annual net immigration is 25,000 persons in 2020–2085, or 10,000 higher than in the baseline projection. This additional immigration comes entirely from group 1. Emigration propensity is unchanged at baseline level, so net immigration from group 1 increases and net immigration from other groups remains unchanged at the same level as in the baseline projection.

Scenario 2.2 Annual net immigration is 25,000 persons in 2020–2085, or 10,000 higher than in the baseline projection. The additional immigration comes entirely from group 2. Emigration propensity is unchanged at baseline level, so net immigration from group 2 increases and net immigration from other groups remains unchanged at the same level as in the baseline projection.

Scenario 2.3 Annual net immigration is 25,000 persons in 2020–2085, or 10,000 higher than in the baseline projection. The additional immigration comes entirely from group 3. Emigration propensity is unchanged at baseline level, so net immigration from group 3 increases and net immigration from other groups remains unchanged at the same level as in the baseline projection.

Scenario 3 Reduced emigration increases the number of persons remaining in the country each year by 10,000, resulting in annual net immigration of 25,000 persons in 2020–2085. Emigration numbers are by default reduced across all groups in ratio to their total number of emigrants. As a result, return migration by Finnish-born persons exceeds their emigration. In the long term it is not possible that the number of Finnish-born persons returning to the country can be higher than the numbers emigrating. For this reason, it is assumed that from 2040 onwards, the number of native-born emigrants will be the same as the number of return migrants. In other words, it is assumed that net immigration by native-borns will not be positive from 2040.[3] It is assumed that emigration by foreign-born persons will decrease more sharply from 2040 so that annual net immigration will be 10,000 persons higher than in the baseline projection.

5 Results

5.1 Population

Migration has different impacts on the population structure in different scenarios. This is due both to the number of migrants and to the different fertility rates in different immigrant groups. The fertility rate in immigrant groups 1 and 2 is not significantly higher than for native-borns, but immigrant group 3 has a significantly higher fertility rate than others (Figure 3.3.1). In scenario 2.3 the population is projected to increase to around 6.4 million by 2085,

3 The year 2040 has been chosen arbitrarily. However, over a 20-year period it is possible that return migration by Finnish-born persons could exceed their emigration.

while in scenario 1.2 the population will decrease to around 4.2 million. In other scenarios the population number will increase to around 6 million by 2085 (Figure 5.1.1).

Under the baseline projection, the number of people of working age (15–64) will fall throughout the projection period, but in the 2080s this trend will slow as the decline in the fertility rate comes to a halt in 2019 at 1.45. This is also reflected in a slowdown in the decline in the number of people of working age. In scenario 2.3, the number of people of working age continues to rise towards the end of the projection period as a result of the higher fertility rate in immigrant group 3 (Figure 5.1.2).

The population age structure under scenarios 1.2 and 3 is slightly older than under scenarios 1.1, 2.1, 2.2 and 2.3. In scenario 1.2, this is due to the lower level of net immigration and the younger age structure of immigrants compared to the rest of the population. Emigration is more heavily concentrated in older age groups than immigration, which explains the older age structure and smaller number of people of working age in scenario 3 compared to scenarios 1.1, 2.1, 2.2 and 2.3.

Figure 5.1.1 *Total population number in 2005–2085, thousand persons. Historical data for 2005–2018 and scenario projections for 2019–2085.*

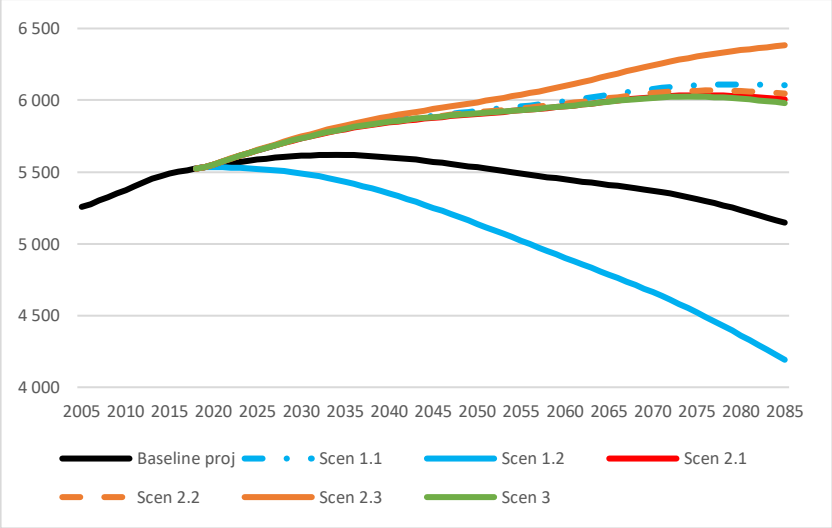
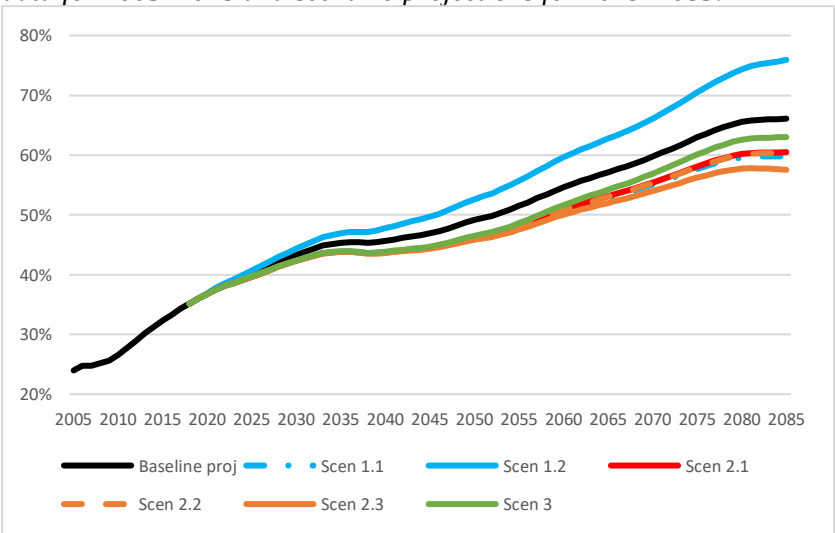


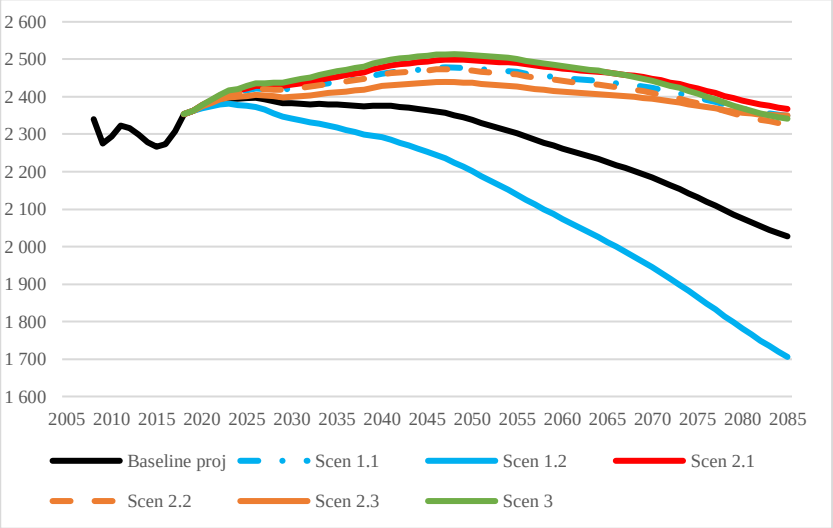
Figure 5.1.2 *Number of population aged 15–64 in 2005–2085, thousand persons. Historical data for 2005–2018 and scenario projections for 2019–2085.*



Under all scenarios it is projected that the old-age dependency ratio will rise from its current level, despite the fact that immigrants are for the most part of working age or children. The development of the old-age dependency ratio reflects the impact of the fertility rate. However, if annual net immigration were 25,000 persons (scenarios 1,1, 2.1–2.3 and 3), the old-age dependency ratio in 2085 would be 3–9 percentage points lower than in the baseline projection, depending on the fertility of immigrants and the age structure of the additional population (Figure 5.1.3 and Table 5.1.1). In scenario 2.3, this ratio falls more sharply than in other immigration growth scenarios towards the end of the projection period. If annual net immigration is 5,000 persons (scenario 1.2), the old-age dependency ratio will climb to around 76 per cent at the end of the projection period.

The demographic dependency ratio is the ratio of non-working-age people (under 15 and over 65) to those of working age (15–65 years). This ratio is also affected by the number of children, and therefore in scenario 2.3 it does not drop to a lower level than in other immigration growth scenarios (Table 5.1.1).

Figure 5.1.3 *Old-age dependency ratio in 2005–2085. Historical data for 2005–2018 and scenario projections for 2019–2085.*



The proportion of foreign-born persons increases to a higher-than-baseline level in all scenarios except 1.2 because of higher net immigration. In the baseline projection the proportion of foreign-born persons increases from the current figure of around 7 per cent to around 22 per cent at the end of the projection period. If annual net immigration were 5,000 persons (scenario 1.2), the proportion of foreign-born persons would rise to around 13 per cent at the end of the projection period. In scenarios 1.1, 2.1 and 2.2, the proportion of foreign-born persons would climb to around 29 per cent. In scenario 2.3 the proportion would be slightly lower because of the higher fertility rate and therefore the increasing number of native-born children in immigrant group 3. In scenario 3, the proportion of foreign-born persons would be around 26 per cent because of reduced native-born emigration.

The number of long-standing residents as a proportion of the additional population born abroad increases during the projection period. In scenarios 1.1 and 2.1–2.3, the additional population consists of immigrants moving into the country from 2020 onwards, and therefore the 2020 additional population consists entirely of persons immigrating during that one year. During the projection period some of these additional immigrants remain in the country and some move out based on their emigration propensity. Each year new additional immigrants continue to arrive in accordance with the immigration assumptions. Group 3 has a lower emigration propensity than other groups and therefore in scenario 2.3, foreign-born additional immigrants have on average longer periods of residence in the country than in scenarios 1.1,

2.1 and 2.2. Group 1 accordingly has a higher emigration propensity than other groups, and in scenario 2.1 the average period of residence for the foreign-born additional population is shorter than in other scenarios.

Emigration decreases in scenario 3 and therefore the additional population consists of persons who have moved into the country before the current point of examination. It follows that in this scenario, the lengths of residence for the additional population are longer than in other scenarios.

Table 5.1.1 *Population results for 2020–2085*

		2020	2025	2030	2045	2065	2085
Total population	**baseline**	5 544	5 587	5 613	5 571	5 411	5 147
thousand persons	**scen 1.1**	5 554	5 651	5 736	5 893	6 037	6 103
	scen 1.2	5 534	5 523	5 490	5 250	4 785	4 191
	scen 2.1	5 554	5 650	5 733	5 878	5 991	6 007
	scen 2.2	5 554	5 650	5 735	5 886	6 014	6 049
	scen 2.3	5 554	5 654	5 746	5 938	6 171	6 383
	scen 3	5 554	5 650	5 735	5 883	5 989	5 980
Population 15–64	**baseline**	3 419	3 406	3 387	3 299	3 039	2 746
thousand persons	**scen 1.1**	3 427	3 454	3 476	3 526	3 453	3 344
	scen 1.2	3 411	3 358	3 298	3 071	2 625	2 148
	scen 2.1	3 427	3 454	3 476	3 521	3 431	3 293
	scen 2.2	3 427	3 454	3 476	3 525	3 443	3 314
	scen 2.3	3 427	3 454	3 477	3 539	3 516	3 500
	scen 3	3 427	3 455	3 479	3 525	3 415	3 238
Old-age dependency	**baseline**	36.8	40.2	43.3	46.9	57.1	66.1
ratio	**scen 1.1**	36.7	39.7	42.3	44.5	52.9	59.8
	scen 1.2	36.9	40.7	44.3	49.7	62.8	75.9
	scen 2.1	36.7	39.7	42.3	44.6	53.1	60.5
	scen 2.2	36.7	39.7	42.3	44.5	53.0	60.3
	scen 2.3	36.7	39.7	42.3	44.3	52.0	57.5
	scen 3	36.7	39.7	42.3	44.7	54.2	63.0
Demographic	**baseline**	62.2	64.0	65.7	68.9	78.0	87.4
dependency ratio	**scen 1.1**	62.1	63.6	65.0	67.1	74.8	82.5
	scen 1.2	62.2	64.5	66.5	70.9	82.3	95.1
	scen 2.1	62.1	63.6	64.9	66.9	74.6	82.4
	scen 2.2	62.1	63.6	65.0	67.0	74.7	82.5
	scen 2.3	62.1	63.7	65.3	67.8	75.5	82.4
	scen 3	62.1	63.5	64.9	66.9	75.4	84.7
Persons born abroad	**baseline**	7.6	9.0	10.4	14.5	19.1	22.2
% of population	**scen 1.1**	7.8	10.0	12.1	18.0	24.4	28.5
	scen 1.2	7.4	8.0	8.6	10.5	12.5	13.2
	scen 2.1	7.8	10.0	12.1	18.1	24.6	28.9
	scen 2.2	7.8	10.0	12.1	18.1	24.5	28.7
	scen 2.3	7.8	10.0	12.1	17.9	24.0	27.4
	scen 3	7.7	9.4	11.1	16.2	22.2	26,3

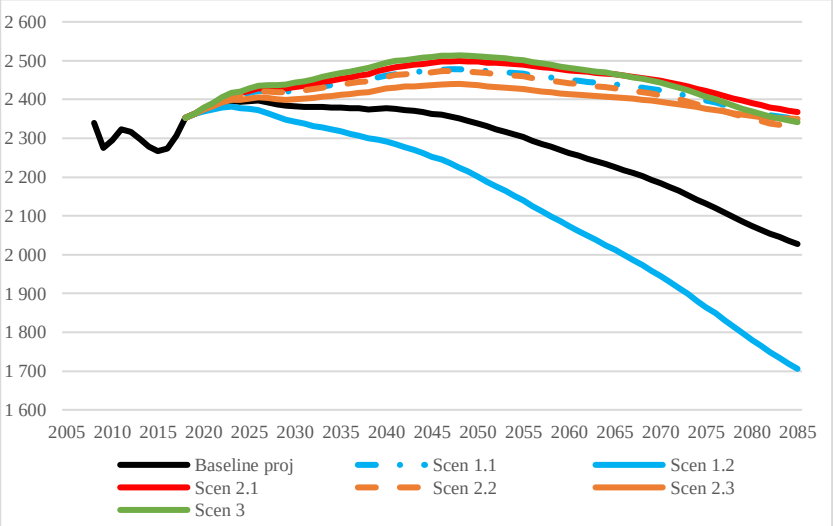
5.2 Employment

The number of employed persons (Figure 5.2.1) depends both on the number of persons of working age (Figure 5.1.2 and Table 5.1.1) and on the employment rate.

The impacts of the fertility rate begin to show up in the number of persons of working age from the late 2030s onwards. The classification of immigrants into three groups is based precisely on employment profiles, and this is seen in the early part of the projection period in that the numbers of people of working age are very similar through to the 2050s in all

scenarios that project an increase in net immigration (Figure 5.1.2). The differences in the numbers of employed persons are evened out at the end of the projection period due to the association of time spent in the country with employment outcomes, and also due to the assumption used in the projection that native-born descendants of immigrants have better employment outcomes than their parents. This is particularly evident in scenario 2.3, where the fertility rate is significantly higher and periods spent in the country are longer than among other foreign-born persons. The number of employed persons is lowest in scenario 1.2 due to the smallest number of persons of working age. The number of employed persons is highest through to the end of the 2060s in scenario 3 because of the better employment outcomes of the additional population. The number of employed persons then falls close to the numbers in scenarios 1.1, 2.1–2.3 because of the declining number of people of working age.

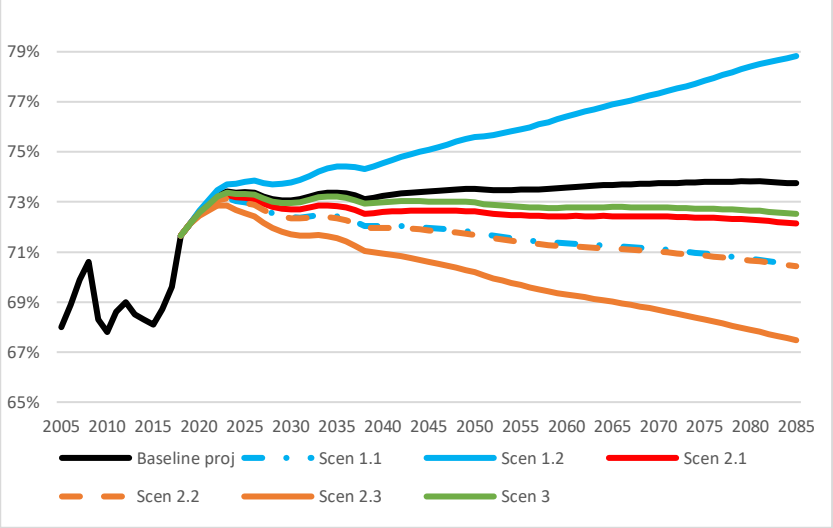
Figure 5.2.1 *Number of employed persons in 2019–2085, thousand persons. Historical data for 2010–2017 and scenario projections for 2018–2085.*



The employment rate[4] increases in tandem with the proportion of persons in the population with high employment outcomes (Figure 5.2.2). Scenario 1.2 has the highest proportion of native-born persons and therefore the highest employment rate. In this scenario the employment rate rises to around 79 per cent at the end of the projection period, compared to 74 per cent in the baseline projection. Scenario 2.3 projects the lowest employment rate for the total population at around 68 per cent at the end of the projection period. In scenario 2.1 the employment rate falls short of the baseline projection because native-born persons have better employment outcomes than all foreign-born persons, even though immigrants' employment outcomes do improve with time spent in the country (Figure 3.2.1). This applies most particularly to group 3 immigrants. The reason for this is that immigrants' employment rate improves with the length of time spent in the country and that the employment rate of immigrants' children is assumed to rank midway between their parents' and native-borns' employment rates. The employment rates in scenarios 1.1. and 2.2 are very close to each other because group 2 immigrants have medium employment outcomes and scenario 1.1. includes immigrants from all groups.

[4] *Employment rate is the number of employed persons aged 15–64 as a proportion of the total population aged 15–64. The employment rates given in this section are consistent with the concepts used in Statistics Finland's Labour Force Survey.*

Figure 5.2.2 *Employment rate for population aged 15–64 in 2005–2085. Historical data for 2005–2017 and scenario projections for 2018–2085.*



The percentage of employed persons in the total population will continue to fall throughout the projection period as a result of population ageing both in the baseline projection and in all scenarios (Table 5.2.1).

Table 5.2.1 *Employment rate and percentage of employed persons in population*

		2020	2025	2030	2045	2065	2085
employment rate:	**baseline projection**	72.6	73.4	73.1	73.4	73.7	73.8
percentage of employed	**scen 1.1**	72.5	73.0	72.4	72.0	71.2	70.5
persons aged 15–64	**scen 1.2**	72.7	73.8	73.8	75.1	76.9	78.8
in population of same age	**scen 2.1**	72.6	73.2	72.7	72.6	72.4	72.1
	scen 2.2	72.5	73.0	72.4	71.9	71.1	70.4
	scen 2.3	72.4	72.5	71.7	70.6	69.0	67.5
	scen 3	72.6	73.3	73.0	73.0	72.8	72.5
percentage of employed persons in total population	**baseline projection**	42.8	42.9	42.4	42.4	41.1	39.4
	scen 1.1	42.8	42.8	42.2	42.0	40.4	38.4
	scen 1.2	42.8	43.0	42.7	42.9	42.1	40.8
	scen 2.1	42.8	42.9	42.4	42.4	41.1	39.4
	scen 2.2	42.8	42.8	42.2	42.0	40.4	38.5
	scen 2.3	42.7	42.5	41.8	41.0	38.9	36.5
	scen 3	42.8	43.0	42.6	42.7	41.2	39.2

5.3 Earnings level

The long-term assumption for real earnings growth is 1.5 per cent and for inflation 1.7 per cent a year. Average monthly earnings (*average earnings*) are calculated by adding up annual earnings for the whole year and dividing the sum by 12.

The contribution of the additional population to the total population's average earnings increases in proportion to the share of employed persons in the additional population (Table 5.3.1). In scenario 2.3 the additional population has low average earnings in the first years of the projection. As the employment rate in the additional population is also low, average earnings in this scenario do not initially fall significantly compared to the baseline projection. In scenario 3 the additional population has the highest earnings from the start of the projection period. This is because the proportion of native-borns and foreign-born persons with long periods of residence in the country is highest in this scenario. The earnings of the additional

population increase towards the end of the projection period, but nonetheless remain lower than in the rest of the population.

The decrease in average earnings compared to the baseline projection is smallest in scenario 3. Average earnings fall the most in scenario 2.3. If net immigration decreases, average earnings rise.

Table 5.3.1 *Average monthly earnings of total population and additional population at 2017 price level*

		2020	2025	2030	2045	2065	2085
total	**baseline**	3 209	3 400	3 667	4 572	6 139	8 254
population	**scen 1.1**	3 207	3 390	3 652	4 533	6 039	8 060
	scen 1.2	3 210	3 411	3 682	4 615	6 259	8 520
	scen 2.1	3 207	3 388	3 651	4 537	6 056	8 100
	scen 2.2	3 207	3 389	3 651	4 529	6 035	8 060
	scen 2.3	3 208	3 396	3 658	4 530	6 012	7 991
	scen 3	3 208	3 396	3 659	4 549	6 078	8 140
additional	**scen 1.1**	1 932	2 176	2 785	3 691	4 983	6 816
population	**scen 2.1**	2 024	2 283	2 909	3 896	5 275	7 163
	scen 2.2	1 853	2 054	2 665	3 579	4 878	6 721
	scen 2.3	1 542	1 725	2 417	3 187	4 433	6 325
	scen 3	2 772	3 046	3 356	4 178	5 504	7 392

5.4 Earned income and GDP

Population employment and earnings both impact upon the sum total of earned income. At the end of the projection period the sum of earned income will be around 24–29 billion euros higher (at 2017 price level) than in the baseline projection if annual net immigration is 10,000 persons higher than the baseline forecast (scenarios 1.1, 2.1–2.3 and 3). If annual net immigration is 10,000 persons lower than the baseline projection (scenario 1.2), the sum of earned income will be some 26 billion euros lower than the baseline forecast at the end of the projection period (Table 5.4.1).

Table 5.4.1 *Sum of earned income and GDP at 2017 price level*

		2020	2025	2030	2045	2065	2085
Sum of earned	**baseline**	91.2	97.7	104.9	129.9	164.5	201.6
income, bn euros	**scen 1.1**	91.2	98.2	106.1	134.8	177.3	227.9
	scen 1.2	91.2	97.3	103.6	125.1	151.8	175.3
	scen 2.1	91.3	98.4	106.5	136.0	179.6	230.9
	scen 2.2	91.2	98.2	106.0	134.5	176.4	225.8
	scen 2.3	91.2	97.9	105.3	132.7	174.0	226.0
	scen 3	91.3	98.8	107.2	137.2	180.4	229.5
GDP per capita,	**baseline**	43.1	46.1	49.2	61.4	80.0	103.1
thousand euros	**scen 1.1**	43.0	45.8	48.7	60.2	77.3	98.5
	scen 1.2	43.2	46.4	49.6	62.6	82.7	107.2
	scen 2.1	43.0	45.9	48.9	60.9	78.9	101.1
	scen 2.2	43.0	45.8	48.7	60.1	77.2	98.2
	scen 2.3	43.0	45.6	48.2	58.8	74.4	94.2
	scen 3	43.1	46.1	49.2	61.4	79.2	101.0

It is assumed that in the coming years, the sum of the earned income will stand at 38 per cent of GDP, the same figure as in 2017. The estimate for GDP growth is obtained from the projections for the sum of earned income. Under the baseline projection it is estimated that GDP per capita will rise from 43,000 euros in 2020 to 103,000 euros (at 2017 price level) in 2085 (Table 5.4.1). The poorer the employment outcomes in the population, the lower the GDP per capita figure. In scenario 1.2 GDP per capita is some 7,000 euros higher and in scenario 2.3 some 10,000 euros lower than at the end of the baseline projection.

5.5 Number of pensioners

Most immigrants are of working age, but over time they will reach retirement age. If they get into employment, they too will begin to accrue eligibility for an earnings-related pension. Since the projection assumes that immigrants have the same probability of retiring on an earnings-related pension as the rest of the population, the number of earnings-related pension recipients is determined on the basis of the population structure and the employment rate. The total number of pension recipients is determined on the basis of the population structure.

Under the baseline projection the number of all pensioners rises to around 1.8 million in 2085. If annual net immigration is 25,000 persons (scenarios 1.1, 2.1–2.3 and 3), the number of pension recipients will climb to around 2 million. Differences in the total population number attributable to fertility will not yet be reflected in the number of old-age pensioners during the projection period. This is because the descendants of immigrants moving into the country during the projection period will only begin to reach the age of eligibility for old-age retirement after this period has elapsed. Because of the older age structure in scenario 3, the number of pensioners is slightly higher than in scenarios 1.2, 2.1, 2.2 and 2.3. In scenario 1.2 the number of pensioners in 2085 is around 1.6 million.

In 2018 the ratio of pensioners to employed persons stood at 63 per cent. This ratio increases both in the baseline projection and in all other scenarios because of changes to the population age structure. In the baseline projection the ratio of pensioners to employed persons is 88 per cent at the end of the forecast period. In scenario 1.2 the ratio is higher still at 93 per cent. In scenarios 1.2, 2.1, 2.2 and 2.3, the number of pensioners is roughly the same, so the ratio of pensioners to employed persons is the lower the higher the number of employed persons. Scenario 3 projects an increase in this ratio to 86 per cent.

5.6 Benefit level

The ratio of average pension to average earnings has increased in recent years as a result of structural changes to the pensioner population. In the baseline projection this ratio will fall from 2025 onwards mainly because of the downward effect of the life-expectancy coefficient on pension levels. The decline in the average pension to average earnings ratio will slow some time around 2050 (*[Tikanmäki et al. (2019)]* and *[Reipas (2019]).*

Immigrants have shorter employment careers in Finland than native-borns and therefore their earnings-related pensions will not accrue to the same level. Their average earnings are also lower than those of native-borns throughout the projection period, even though they do rise with time spent in the country. The low level of immigrants' earnings-related pensions means that they have to be topped up by national and guarantee pensions, which are not assessed in closer detail in this report. In scenario 1.2 the average pension to average earnings ratio increases somewhat more than in the baseline projection from the 2050s onwards, and by the end of the projection period it is one percentage point higher than the baseline figure. In other scenarios it is estimated that the ratio of average pension to average earnings will be around

one percentage point lower than the baseline projection at the end of the forecast period. Due to simplifications made for projection purposes, no detailed results are presented here for average pensions.

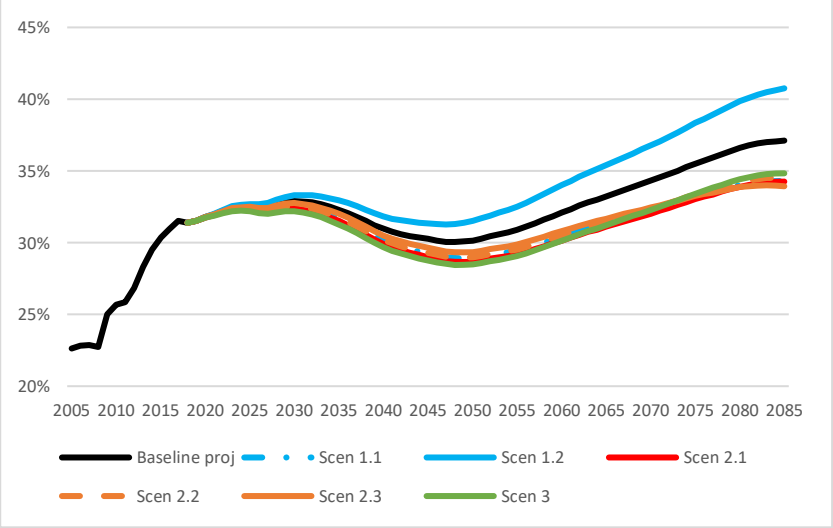
5.7 Pension expenditure

The development of the relationship between earnings-related pension expenditure and the sum of earned income is mainly explained by the development of old-age pension expenditure. Earnings-related pension expenditure has risen sharply in recent years as a result of population ageing (Figure 5.7.1). This trend has slowed with the rising retirement age and the reduced average pension to average earnings ratio. In the 2030s earnings-related pension expenditure will begin to fall with the slowdown in the number of pensioners. In the late 2040s earnings-related pension expenditure and the sum of earned income will return to growth again as the number of pensioners relative to employed persons starts rising and the decline in the ratio of average pension to average earnings slows down. (*[Tikanmäki et al. (2019)]* and *[Reipas (2019])*.

The baseline projection is that the ratio of earnings-related pension expenditure to the sum of earned income will climb to 33 per cent in the 2020s, then start to fall in the 2030s and reach its lowest level at 30 per cent in the late 2040s. The ratio will then start to rise again and reach 37 per cent at the end of the projection period.

Scenario 1.2 shows the highest ratio of earnings-related expenditure to the sum of earned income throughout the projection period. This is due to the population age structure. In this scenario the ratio rises to almost 41 per cent at the end of the projection period. If annual net immigration stands at 25,000 persons, the ratio will fall to around 29 per cent at the end of the 2040s and climb to 34–35 per cent at the end of the forecast period. The differences between the scenarios are due to the number, age structure and employment outcomes of immigrants.

Figure 5.7.1 *Ratio of earnings-related expenditure to sum of earned income in 2005–2085. Historical data for 2005–2017 and scenario projections for 2018–2085.*



Under the baseline projection, earnings-related pension expenditure accounts for around 90 per cent of statutory pension expenditure at the start of the forecast period. The figure continues to rise throughout the forecast period. The earnings-related pensions of foreign-born persons only begin to accrue once they have arrived in the country and entered the labour market, and their careers often remain shorter than for the rest of the population. As they also have lower earnings than the rest of the population, the bulk of pension expenditure attributable to foreign-born persons initially consists of national and guarantee pensions. Later

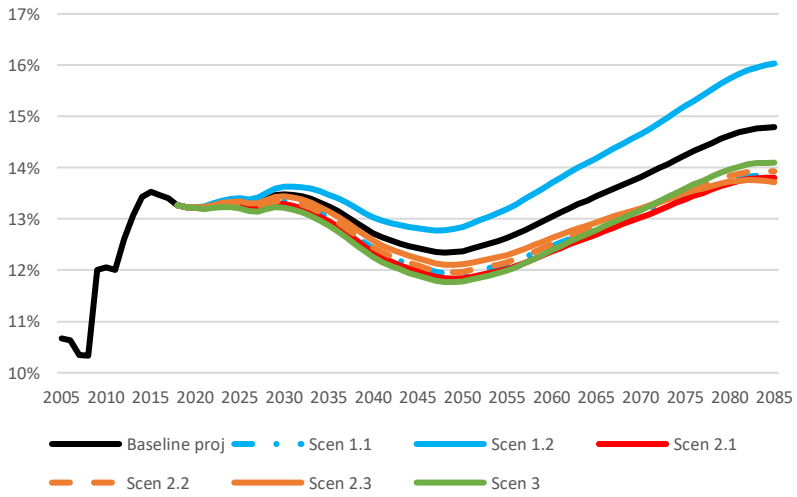
on, too, national pensions account for a larger share of total pension expenditure attributable to immigrants than native-borns.

This report provides only a rough assessment of national pension and guarantee pension expenditure attributable to immigrants. The assumption is that the number of all pensioners relative to the age-standardised population will remain constant and that earnings-related pensions will be distributed among the population in the same way as in the baseline projection.

Statutory pension expenditure to GDP has risen sharply in recent years with the growing number of pensioners. Standing at just over 10 per cent at the beginning of the century, statutory pension expenditure climbed to 13.4% of GDP in 2017 (Figure 5.7.2). Under the baseline projection, pension expenditure to GDP remains at around this level through to 2030. The number of pensioners will continue to rise until 2030, but at the same time the ratio of average pension to average earnings will fall. After 2030 the growth in the number of pensioners will begin to slow and pension expenditure to GDP will begin to fall. In the late 2040s the ratio of pension expenditure to GDP will fall to just over 12 per cent under the baseline projection. The number of pensioners will then continue to rise and the ratio of average pension to average earnings will no longer significantly fall. Under the baseline projection pension expenditure to GDP will increase, reaching almost 15 per cent at the end of the projection period in 2085.

Scenario 1.2 shows the highest ratio of pension expenditure to GDP throughout the projection period. This is due to the population age structure. In this scenario pension expenditure to GDP will rise to 16 per cent at the end of the projection period. If annual net immigration is 25,000 persons, the ratio will drop to around 12 per cent in the late 2040s and rise to around 14 per cent at the end of the projection period. The differences between the scenarios are due to the number, age structure and employment outcomes of immigrants.

Figure 5.7.2 *Statutory pension expenditure to GDP in 2005–2085. Historical data for 2005–2017 and scenario projections for 2018–2085.*



5.8 Pension contributions

Under the baseline projection, pension contribution rates for private sector employees under the Employees Pensions Act (TyEL) will have to be raised slightly beginning from the 2020s. The contribution rate will increase to just under 25 per cent of earnings by the early 2030s,

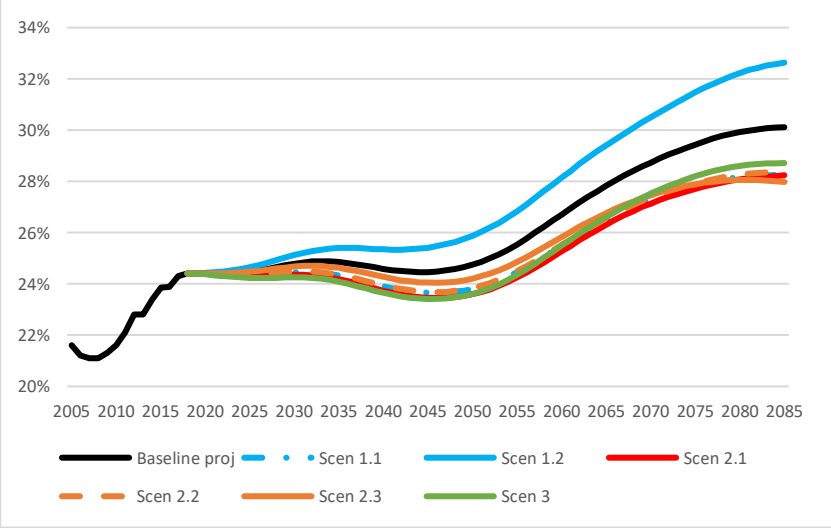
and then lower somewhat. In the latter half of the century the contribution rate will have to be significantly increased as changes in the population structure force an increase in TyEL expenditure. In 2085, the TyEL contribution rate will be 30.1 per cent of wages (*[Tikanmäki et al. (2019)]* and *[Reipas (2019])*.
If net immigration is higher than in the baseline projection, the ratio of pensioners to employed persons will fall because of the younger age structure. As a result, both pension expenditure and the pension contribution rate in relation to the sum of earned income will also fall. The magnitude of the impact will depend on employment outcomes in the additional population.

Under scenarios 1.1, 2.1, 2.2 and 3, the TyEL contribution rate will decrease around the middle of the century by about one percentage point compared to the baseline projection (Figure 5.8.1 and Table 5.8.1). The contribution rate will then begin to rise, but not as sharply as in the baseline projection. Under scenarios 1.1, 2.1 and 2.2, the contribution rate will be some two percentage points lower at the end of the projection period than in the baseline projection. In scenario 3 the difference will be slightly smaller, i.e. around one and a half percentage points, because of the older age structure.

Under scenario 2.3, all additional immigrants come from the low employment outcome group and through to the end of the 2060s the contribution rate in this scenario will be higher than in scenarios 1.1, 2.1, 2.2 and 3. From the beginning of the 2070s the contribution rate will increase to a lesser extent than in other scenarios. This is due to a younger age structure, the positive association of length of residence with employment outcomes and to the assumption that immigrants' children will have better employment outcomes than their parents. In this scenario, too, the contribution rate at the end of the projection period is some two per cent lower than in the baseline projection.

Under scenario 1.2, the contribution rate will rise in the 2030s to over 25 per cent, or some half a percentage point higher than in the baseline projection. The contribution rate will remain at this level through to the end of the 2040s, when it will begin to rise with population ageing, climbing to a level some 2.5 percentage points higher than in the baseline projection.

Figure 5.8.1 *Ratio of TyEL contribution rate to earnings in 2005–2085. Historical data for 2005–2017 and scenario projection for 2018–2085.*



The development of the TyEL contribution rate described above is calculated under prevailing rules and regulations. The TyEL contribution rate can also be estimated by calculating a constant rate, which together with accumulated assets would suffice to cover all future TyEL expenditure. In the baseline projection this sufficient constant contribution rate would be

26.7% of the sum of earned income *[Tikanmäki et al. (2019), Annex 2]* and *[Reipas (2019)]*. If net immigration were 10,000 persons higher than in the baseline projection, the sufficient constant contribution rate would be 1–1.2 percentage points lower than in the baseline projection. A lower level of net immigration would drive up both constant contribution rates by some 1.3 percentage points. The impact is essentially the same for all earnings-related pensions. (Table 5.8.2).

Table 5.8.1 *Ratio of TyEL contribution rate to earnings, per cent.*

	2020	**2025**	**2030**	**2045**	**2065**	**2085**
Baseline	24.4	24.5	24.8	24.5	27.8	30.1
scen 1.1	24.4	24.4	24.5	23.7	26.5	28.3
scen 1.2	24.4	24.7	25.1	25.4	29.4	32.6
scen 2.1	24.4	24.3	24.4	23.5	26.3	28.2
scen 2.2	24.4	24.4	24.5	23.7	26.6	28.4
scen 2.3	24.4	24.5	24.7	24.0	26.8	28.0
scen 3	24.4	24.2	24.3	23.4	26.6	28.7

Table 5.8.2 *Constant contribution rates for all earnings-related pensions and TyEL, % of sum of earned income.*

	Constant contribution rate		**Difference compared to baseline**	
	TyEL	**All earnings-related pension acts**	**TyEL**	**All earnings-related pension acts**
baseline	26.7	29.0		
scen 1.1	25.6	27.9	-1.1	-1.2
scen 1.2	27.9	30.4	1.3	1.3
scen 2.1	25.5	27.8	-1.2	-1.2
scen 2.2	25.7	28.0	-1.0	-1.1
scen 2.3	25.6	27.8	-1.1	-1.2
scen 3	25.7	27.9	-1.0	-1.1

Annex 1. Immigrant classification

Immigrants are assigned to one of three groups based on their country of birth. The classification is based on HDI *[UNDP (2018)]*. Group 1 mainly consists of very high HDI countries, group 2 of high and medium HDI countries and group 3 of low HDI countries. Countries that have been moved from one category to another based on employment profiles are indicated with an asterisk (*).

Immigrant group	**1**	**2**	**3**
Country of birth	Andorra	Albania	Afghanistan
	Argentina	Algeria	Angola
	Australia	Armenia	Benin
	Austria	Azerbaijan	Burkina Faso
	Bahrain	Bahamas	Burundi
	Belgium	Bangladesh	Chad
	Brunei	Barbados	Comoros
	Canada	Belarus	Democratic Republic of Congo
	Chile	Belize	Djibouti
	Croatia	Bhutan	Eritrea
	Cyprus	Bolivia	Eswatini
	Czech Republic	Bosnia and Herzegovina	Ethiopia
	Democratic Republic of Korea	Botswana	Gambia
	Denmark	Brazil	Guinea
	Estonia	Bulgaria	Guinea-Bissau
	Former Czechoslovakia	Cambodia	Haiti
	Former Soviet Union	Cameroon*	Iraq*
	France	Cape Verde	Ivory Coast
	Germany	China	Liberia
	Greece	Columbia	Madagascar
	Hungary	Congo	Malawi
	Iceland	Costa Rica	Mali
	Ireland	Cuba	Mauritania
	Israel	Dominica	Mozambique
	Italy	Dominican Republic	Niger
	Japan	East Timor	Nigeria
	Jersey	Ecuador	Papua New Guinea
	Kuwait	Egypt	Republic of Central Africa
	Latvia	El Salvador	Rwanda
	Lithuania	Equatorial Guinea	Salomon Island
	Luxembourg	Fiji	Senegal
	Malta	Former Serbia and Montenegro	Sierra Leone
	Monaco	Former Yugoslavia	Somalia
	Montenegro	Gabon	South Sudan
	Nepal*	Georgia	Sudan
	Netherlands	Ghana	Syria
	New Zealand	Grenada	Tanzania
	Norway	Guatemala	Togo
	Philippines*	Guyana	Uganda
	Poland	Honduras	Yemen
	Portugal	India	Zimbabwe
	Qatar	Indonesia	Unknown (Somali language)
	Republic of Korea	Iran	
	Romania	Jamaica	
	Saudi Arabia	Jordan	
	Singapore	Kazakhstan	
	Slovakia	Kenya	
	Slovenia	Kyrgystan	
	Spain	Laos	

	Sweden	Lebanon
	Switzerland	Libya
	Tuvalu	Malaysia
	United Arab Emirates	Maldives
	United Kingdom	Mauritius
	United States (USA)	Mexico
	Vatican	Moldova
	Unknown (other than Somali language)	Mongolia
		Morocco
		Myanmar
		Namibia
		Nicaragua
		North Makedonia
		Oman
		Pakistan
		Palau
		Palestine
		Panama
		Paraguay
		Peru
		Russia*
		Saint Kitts and Nevis
		Saint Lucia
		Saint Vincent and the Grenadines
		Samoa
		Serbia
		Seychelles
		South Africa
		Sri Lanka
		Suriname
		Tajikistan
		Thailand
		Tonga
		Trinidad and Tobago
		Tunisia
		Turkey
		Turkmenistan
		Ukraine
		Uruguay
		Uzbekistan
		Vanuatu
		Venezuela
		Vietnam
		Zambia

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