Over the last century, the population structure of Finland has changed in many ways. The share of the working population in the Finnish population as a whole was at its highest midway through the 1980s. During the decades that have followed, the age dependency ratio, in other words the ratio of the working population to the rest, has moderately decreased. The relatively large size of the age cohorts reaching retirement age between 2008 and 2013 has considerably decreased the share of the working population. In this study we analyse the age distribution of the population and the development and connection between certain economic entities in theory and practice, with the help of domestic data and international comparison. In some cases, the domestic statistical reviews extend from the 1920s until the year 2013.

**Distribution of national income by age**

The period of deteriorating population dependency ratio is described and analysed with the help of National Transfer Accounts (NTA). When preparing National Transfer Accounts, the national income usage defined in the system of national accounts is divided per age group. Preparing National Transfer Accounts thus requires the specification of age profiles for labour income and consumption. National Transfer Accounts are also used to describe the use and financing of lifecycle deficit, which is the difference between consumption and labour income.

The Finnish National Transfer Accounts have been created for the years 1990–2006. The time span has been determined in particular based on the availability of data on consumption. In addition to the history series, we also present calculations on the future development of the
lifecycle deficit aggregate based on the forecasted change in population structure and the National Transfer Accounts.

When creating the National Transfer Accounts, issues taken into consideration include the accumulation of wealth (savings) or its dismantling, income transfers, as well as the institutions of both the private and public sectors as means of distributing income across the lifecycle and between age groups. The Accounts are used to differentiate between economic measures carried out through the public economy, markets and family (extended family, third sector). Age-related transfers within the public economy typically include pensions and expenditure for healthcare and education. However, the same assignments could be implemented through the markets and in the shape of private consumption.

From the international perspective, Finland has two distinctive traits when it comes to income transfer between generations. First of all, the significance of age-dependent public expenditure is great. Approximately two thirds of public-sector expenditure may be categorized as age-dependent, which equals approximately 30 per cent in proportion to the gross national product. However, unlike in most other countries, the net wealth of the public sector is positive, due to the partly funded statutory earnings-related pension insurance. Another feature specific to Finnish society, compared to other industrial countries, is the large age cohorts born after the war.

In the time period 1990–2006, for which the National Transfer Accounts have been prepared, age-related income transfers have on average shifted from older age groups to younger. Public income transfers have held a central position: Until 2006, investments in education, day-care and family policy were larger than investments in healthcare, care of the elderly and pensions. Income transfer emphasis on younger age cohorts have decreased almost without interruption during the period under review. We estimate that the change in population structure permanently shifted the emphasis of income transfers towards the ageing population at the end of the 2000s.

The age profiles for consumption and wage income define the economic lifecycle

The difference between consumption and wage income according to age is called lifecycle deficit. It is large and positive, at young and old ages alike. Lifecycle deficits are possible since the economic systems maintain two types of income flows between the age groups: public and private income transfers, and the reallocation of funds on financial grounds. We have separated the change in lifecycle deficit from the change in population structure, as well as from consumption and wage income to the relevant degree.

The altered age structures in consumption and production are reflected on the lifecycle deficit aggregate of the economy as a whole. On average, the lifecycle deficit of the economy as a whole, in other words the difference between overall consumption and the wage sum, was only a few per cent in relation to the wage sum of the economy from the mid-1970s to the
end of the 1980s. Following the year 1990, this ratio has grown considerably and reached 17 percentage points in 2006.

In the estimate we present in our research, the relative lifecycle deficit would, in total, have grown by 5.5 percentage points by 2006, had the structure of consumption and wages remained fixed during the period under review. Based on this deduction, the change in population structure accounts for approximately 40 per cent of the increase in realised deficit between the years 1990–2006, the rest is explained by the development of consumption and wages. If the change in the age structure had been realised, the wage profile development would have lowered the lifecycle deficit by approximately four percentage points. The impact that the labour market and population structure have on the lifecycle deficit of the economy as a whole go in opposite directions, and their combined impact is close to zero. A positive labour market development has all but compensated for the negative impact that the population structure has had on the lifecycle deficit.

The population development alone would have lowered the young age deficit during the period under review. A delayed entry into the labour markets has, however, had the opposite effect. This has more than overridden the impact of population development, and the young age deficit has grown during the period under review. Regarding factors affecting development, changes to the old-age deficit have been the opposite. On the other hand, the increased presence of the ageing population on the labour market has revoked three quarters of the deficit that the population development alone would have achieved. Extended working lives have dampened the increase in deficit that would have been created by the population ageing according to the age group consumption structure provided.

Private consumption has increased the lifecycle deficit

The growth of private consumption in relation to the average wage has increased the lifecycle deficit. Without the increase in age-dependent consumption, the lifecycle deficit of the entire economy would have been at a level 13 percentage points lower in relation to the wage sum of the economy. Consumption in relation to average wages has grown in all age groups. From the point of view of the deficit of the economy as a whole, the change in consumption has had an almost equally significant effect on the growth of the overall deficit at old age as has the shrinking lifecycle surplus produced in middle age. Since the amount of the population that produces the old-age deficit is significantly smaller than the surplus-producing middle-aged population, the consumption of the elderly population, per person, has grown in relative terms. Compared to the year 1990, the relative status of the ageing population, in terms of consumption, was better in 2006.

The deficit has grown by more than six percentage points in relation to the wage sum since 2006. The wage and consumption profiles of 2006, together with the realised population development, almost fully explain the realised change. It remains for later research to ponder what possible role relative changes in the structure of work income and consumption have had.
We have evaluated the role that private and public income transfers as well as asset based reallocations play in the financing of the lifecycle deficit. In our reviews, we have utilized five age groups between the ages of 0–19, 20–29, 30–54, 55–64 and 65+. We describe the average financing per person, in relation to the average wage of those of prime working age. The most significant changes in the financing of the lifecycle surplus/deficit have occurred in the ten-year age groups that precede and follow the prime working age population between 30 and 54 years of age.

Where the public sector is concerned, income transfers have held a more significant position than capital economy measures in the age-based realignment of resources. In our study we have distributed public net income transfers to money income transfers, as well as to lifecycle surplus/deficit funding based on the use of public services that are subsidised or free of charge. Age-related public services include education, healthcare and care services. Of all income transfers in money, pensions are the single most important group of age-related income transfers. Other significant groups are family policy support and unemployment security. Income transfers are reviewed at the net amounts. It is assumed that the age groups participate in the financing of public services in relation to the taxes they pay, excluding social insurance contributions.

Public net income transfers in money have decreased most significantly in the age group of 55–64-year-olds. Compared to the top value of the review period, money income transfers have decreased by 15 percentage points in relation to the annual wages of the middle-aged. In this age group, income transfers at net amount were approaching zero in 2006. From the perspective of the lifecycle deficit, a similar development has been observed in the consumption of public services. Development has gone in the opposite direction in the young adults group of those aged 20 to 29. They have turned from providing net funding of public services to benefiting from net income transfers. Viewed per person, the surplus at the beginning of the review period was nine percentage points in relation to the average wage. By the end of the review period, this surplus had changed into a deficit of eight percentage points.

**A growing share of the lifecycle deficit were funded with capital income in 1990–2006**

At the level of the economy as a whole, asset based reallocations, especially capital income, have been used to finance a growing share of the lifecycle deficit during the period under review. The significance of capital income has, in all age groups that we reviewed, followed the same general development, which has been particularly visible for the 55–64-year-olds. A simultaneous and considerable growth in private consumption is connected to the relatively large capital income of recent years in this age group.

The importance of reallocation based on wealth has grown significantly, also among the ageing population of those over 65. This change covers half of the lifecycle deficit of the age group. Increased capital income can also be observed in terms of growth in the private
consumption of the retired population. This is most clearly obvious with the population approaching retirement age, but also the relative consumption level of those over 70 years of age, compared to the average population, has grown in comparison to the situation at the start of the 1990s.

The current consumption level is not sustainable in realistic employment scenarios

The change in the age structure of consumption and production has increased the lifecycle deficit of the economy as a whole. In relation to the economy wage sum, the deficit has grown from three per cent at the beginning of the 1990s to 17 per cent in 2006. The change in population structure accounts for two fifths of this development. The improved labour market situation of the ageing population has, however, significantly dampened the effect of the age structure change in increasing the deficit. Private consumption in relation to the average wages of the working population is mainly responsible for the growth in deficit.

Since the lifecycle deficit of the economy as a whole has grown significantly in relation to the wage sum, there is reason to question whether the current level has been achieved in a sustainable manner. Based on our study it appears that the growth of the deficit was financed in the early stages (the years 1991–1993), by the negative savings measures of the private, but specifically the public sector, in other words by dismantling net wealth. Since then, both private and public saving has again become positive. Private saving has been positive for the last fifteen years, and public saving over the last ten years, which meets sufficiency requirements from the perspective of sustainability.

On the other hand, if taking into account the future population development, additional reviews would be necessary in order to ascertain whether private and public preparations in the form of savings have been sufficient. According to our estimate, maintaining current consumption levels by current employment rates and age profiles of wages would, already around 2030, require using the entire wealth income to fund consumption. From the perspective of economic growth, this is not compatible with a degree of investment that maintains stable employment. With working lives two and half years longer than is currently the case, the lifecycle deficit would be virtually at the same level as it was in 2012, when the current account was in deficit. The level of domestic demand was maintained through incurring debts abroad, which cannot be considered sustainable. As the age dependency ratio continues to weaken, a situation will be reached in 2050 when the lifecycle deficit of careers that have been extended by five years would, with the profiles of consumption and wages given, be at the current level. Based on simple projections, there is reason to doubt whether a consumption level such as the current one can realistically be maintained in any employment scenario.

The final answer to the question of whether the observed development is on a sustainable foundation lies outside the parameters of this study. The growth in deficit has been sustainable in the sense that it has not been based on dismantling the existing net wealth. The share of
private capital income in income available to the economy has grown, as has their significance in the funding of the lifecycle deficit. Evaluating whether private or public wealth is sufficient to cover future commitments and aims will require an analysis of our data using forward-looking methods.

The Publication is available only in Finnish: