

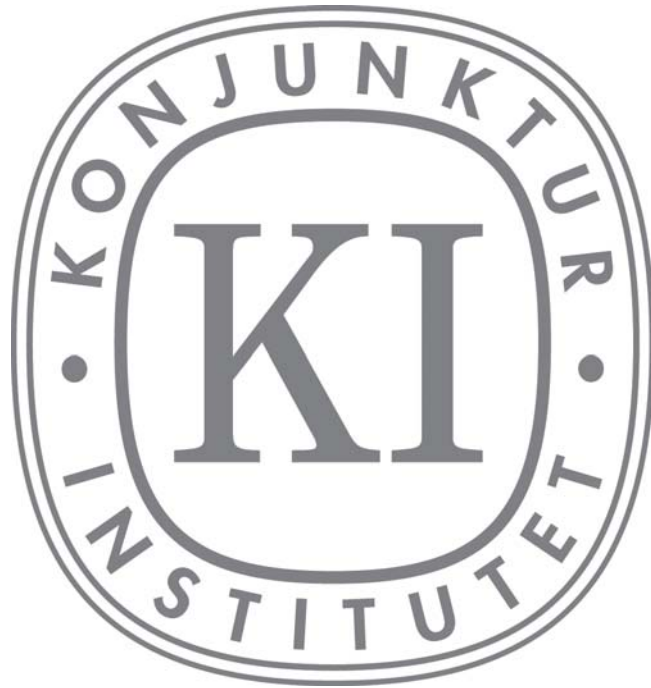
# Occasional Studies

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Fiscal Sustainability Report







## Fiscal Sustainability Report 2017

The **National Institute of Economic Research (NIER)** is a Swedish government agency accountable to the Ministry of Finance. We produce forecasts to support decisions on economic policy in Sweden, analyse economic developments and conduct economic research.

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# Foreword

As part of its mandate, the National Institute of Economic Research (NIER) is to produce long-term fiscal projections and assess the long-term sustainability of public finances. The government sets out the framework for this work each year in its appropriation directions. The assessment is to be quantitative and include a number of scenarios.

This is the NIER's sixth annual report on fiscal sustainability. The previous report was published in March 2016 as *Occasional Studies* No. 47. This year's report, like its three predecessors, has been translated into English and forms part of the NIER's *Occasional Studies* series.

Karolina Holmberg was the project manager. Mikaela Bolin, Gustaf Norrefeldt, Ulla Robling, Elin Ryner and Markus Sigonius were also involved in the project.

The NIER would like to extend its sincerest thanks to the reference group that monitored work on this year's report and provided valuable opinions. The group comprised Thomas Eisensee (Finansinspektionen), Niklas Frank (Swedish Fiscal Policy Council), Annika Wallenskog (Swedish Association of Local Authorities and Regions) and Mikael Witterblad (SNS). The reference group does not necessarily share the conclusions drawn in this report, nor is it responsible for any errors in the report.

Stockholm, 24 February 2017

Urban Hansson Brusewitz

Director-General

# Contents

Summary .....	7
1 Introduction .....	9
2 Definitions and scenarios .....	11
2.1 An unchanged public sector commitment .....	11
2.2 Three scenarios analysed .....	12
2.3 Long-term sustainable public finances .....	13
3 Demographic and macroeconomic developments .....	16
3.1 Demographic developments.....	16
3.2 Labour market assumptions .....	18
3.3 The long-term outlook for the economy .....	21
3.4 Assumptions for government consumption.....	23
4 Public finances until 2040 .....	28
4.1 Primary revenue and expenditure: an overview .....	28
4.2 General government consumption.....	30
4.3 General government investment.....	32
4.4 General government transfers.....	33
4.5 Government revenue with unchanged tax rules.....	36
4.6 Fiscal sustainability through to 2040.....	37
4.7 Fiscal sustainability with adjusted taxes .....	39
5 Sustainability improved from last year's report .....	43
5.1 Higher net lending through to 2021 .....	43
5.2 Lower expenditure means higher net lending through to 2040.....	47
5.3 Higher primary net lending means better long-term sustainability .....	47
6 Alternative scenarios .....	49
6.1 Unchanged behaviour.....	49
6.2 Reduced personnel density .....	49
6.3 Sustainability in the alternative scenarios.....	50
7 Public finances until 2100 .....	55
7.1 Primary revenue and expenditure in the three scenarios .....	55
7.2 Sustainability through to 2100.....	57
References .....	62
Appendix. Key variables for the three scenarios .....	63
 <b>SPECIAL ANALYSES</b>	
Falling replacement rate in the old-age pension system.....	34
Public finances sustainable if the new surplus target is met continuously .....	41
Scenario with no increase in standards in government consumption.....	51
Low real interest rates mean weaker public finances .....	59

## Summary

This report presents an assessment of the sustainability of Sweden's public finances. It is based on the NIER's December 2016 fiscal and economic projections and Statistics Sweden's October 2016 population forecast. The aim of sustainability assessments of this kind is to identify potential future imbalances in public finances at an early stage.

Government expenditure is projected on the assumption that the public sector commitment to welfare is unchanged at current levels. The public sector commitment is defined narrowly here, with the focus on the expenditure side of the budget. Other aspects of this commitment, such as market efficiency and income distribution, are disregarded. The assumption of an unchanged public sector commitment means that personnel density in the provision of welfare services is maintained at current levels. Government revenue is projected on the basis of current tax rules.

The projection horizon generally extends to 2040, but the report also contains projections of government revenue and expenditure through to 2100. The calculations show that both revenue and expenditure increase as a share of GDP through to 2040 if the assumptions made in the calculations are borne out. It is particularly spending on welfare services that rises, due mainly to a higher share of elderly people relative to the population of working age. The major influx of refugees in 2015 means rapid growth in government consumption in the near term. However, as output is also expected to grow strongly, government consumption as a share of GDP hardly increases at all. Revenue rises partly as a result of household consumption growing slightly more quickly than GDP.

All in all, the projections in the report's base scenario indicate a continued primary deficit. The deficit is also of a sufficient size that general government net wealth declines from 20 per cent of GDP today to 14 per cent in 2040.

### **CURRENT TAX RULES NOT SUFFICIENT TO FUND FUTURE EXPENDITURE**

Public finances can be considered sustainable if net financial wealth stabilises as a share of GDP in the long term. A stricter sustainability criterion is for net wealth to be more or less unchanged at current levels. Based on these criteria, government finances cannot be considered fully sustainable through to 2040 in the report's base scenario. Sustainability based on the stricter criterion would require taxes to be raised or spending reduced. However, only limited tightening is required in the base scenario. If this is done by raising taxes, the tax-to-GDP ratio would need to be an average of 0.4 percentage points higher through to 2040.

Based on the European Commission's S2 sustainability indicator, on the other hand, public finances are sustainable indefinitely. This is because net wealth stabilises in the very long run. However, it stabilises at a negative level – in other words, the government sector has net debt.

### **SUSTAINABLE PUBLIC FINANCES DEPEND ON THE POPULATION WORKING EVER LONGER AND BEING EVER HEALTHIER**

The base scenario in this report is based on the assumption that, as average life expectancy increases, people work longer and longer (the retirement age increases) and the elderly are more and more healthy (their need for welfare services decreases).

In an alternative scenario, both the retirement age and demand for health and social care among the elderly at a given age are the same as today. In this scenario, government spending increases more as a share of GDP, due to both a higher rate of growth in government consumption and a lower rate of growth in GDP when there is no increase in working life. In this scenario, the tax-to-GDP ratio needs to be raised by an average of 1 percentage point through to 2040 for public finances to be sustainable.

In another alternative scenario, personnel density in the provision of welfare services gradually decreases. This results in a smaller increase in the standard of welfare services than in the base scenario, with the result that government spending falls instead as a share of GDP. Relative to the base scenario, there is a strengthening of the government budget. The tax-to-GDP ratio could then be lowered by an average of 0.4 percentage points through to 2040 while keeping public finances sustainable.

#### **SUSTAINABILITY IMPROVED FROM LAST YEAR'S REPORT**

Compared with the assessment made in *Fiscal Sustainability Report 2016*, the long-term sustainability of Sweden's public finances has improved considerably.

This is due partly to lower primary expenditure because of changes to the population forecast, but chiefly to lower direct spending on refugee reception. A better primary net lending leads in turn to a more favourable path for general government gross debt than in last year's report. The difference in net lending therefore increases the further into the future the projections extend. This illustrates how short-term changes in public finances can have a major impact on long-term projections, underlining the need for caution when interpreting the results.



# 1 Introduction

The NIER assesses the long-term sustainability of Sweden's public finances annually at the government's request. This year's report is based on the NIER's assessment of the fiscal and economic outlook in December 2016 and Statistics Sweden's population forecast from October 2016.

The projection horizon generally extends to 2040, but the report also contains projections of government revenue and expenditure through to 2100. The aim of sustainability assessments of this kind is not to produce long-term forecasts but to identify potential future imbalances in public finances at an early stage. Any imbalances identified can form the basis for a discussion of how policy should be adjusted over the longer term and so also for the adjustment of fiscal frameworks.

Any assessment of the long-term sustainability of public finances will be exposed to various sources of uncertainty. Government expenditure is generally projected on the assumption of an unchanged public sector commitment to welfare in the future, and different ways of defining an unchanged public sector commitment have a major bearing on future spending. Inherently very uncertain assumptions about the long-term performance of the economy also greatly influence the results. In addition, the calculations are sensitive to the level of net lending at the start of the projection period. This means that significant revisions of initial net lending have a major impact on long-term sustainability.

Taken together, this means that the results concerning the sustainability of public finances must be interpreted with care. Alternative scenarios for economic developments can illustrate how sensitive the projections are to various key assumptions. For example, the report includes an alternative scenario which, unlike the base scenario, assumes that the average retirement age remains the same as today. This helps illustrate the effect on public finances of a gradual increase in both the retirement age and the health of the elderly.

## **STRUCTURE OF THE REPORT**

Chapter 2 discusses how the long-term sustainability of public finances can be measured, and how an unchanged public sector commitment can be defined for the expenditure side of the budget. It also presents the base scenario on which the report focuses, and the assumptions that are modified in the two alternative scenarios that also form part of the report. Chapter 3 looks at future demographic developments and the macroeconomic scenario underlying the projections. Based on these, Chapter 4 then presents developments in public finances until 2040 in the base scenario. Chapter 5 examines why fiscal sustainability has improved considerably from last year's report. Chapter 6 presents two alternative scenarios for government expenditure and their implications for long-term fiscal sustainability.<sup>1</sup> To aid comparison with the government's own projections, a special analysis within this chapter outlines a scenario where government expenditure is projected using the same assumptions that the government applies in its sustainability calculations. Finally, Chapter 7 extends the horizon for the

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<sup>1</sup> The assumptions underlying the different scenarios in terms of retirement age, need for welfare services and personnel density in the public sector are the same as in last year's sustainability report.

analysis to 2100 and draws tentative conclusions about fiscal sustainability with an infinite horizon using the S2 indicator.

Tables providing an overview of key data for public finances in the various scenarios are presented in an appendix.

## 2 Definitions and scenarios

Analyses of the long-term sustainability of public finances aim to ascertain whether government revenue will be sufficient to fund government expenditure in the long run. To conduct such an analysis meaningfully, government expenditure must be allowed to grow at a rate that reflects maintenance of the current level of ambition in the public sector's overall commitment to its citizens when it comes to welfare. However, there is no universal definition of what constitutes an unchanged public sector commitment. The following looks at how this concept is defined and used in this report. The two alternative scenarios analysed in the report are also presented. Finally, the chapter discusses how long-term fiscal sustainability can be analysed in concrete terms: what criteria need to be met for public finances to be considered long-term sustainable?

### 2.1 An unchanged public sector commitment

This report uses the term “public sector commitment” in the sense that there may be an expectation that the public sector will maintain a certain standard of welfare through its operations and a certain level of income protection through the social security system. Other aspects of the public sector commitment, such as promoting economic efficiency and macroeconomic stability and countering income inequality, are disregarded.<sup>2</sup>

In this report, an unchanged public sector commitment means that personnel density in the provision of welfare services per user remains the same as it is today, and that current replacement rates for social transfers are maintained. A constant personnel density in the provision of welfare services does not necessarily mean that the public will perceive the government's level of ambition to be unchanged or, for that matter, sufficient. If the public feel that the standard of welfare services is lagging behind the rest of the economy, this could be seen as an erosion of welfare. This could happen, for example, if patients did not benefit from the latest medical technology. In this report, therefore, the assumption of unchanged personnel density includes a slight annual increase in the standard of welfare services. This increase in standards is a result of prices for capital goods and other inputs being assumed to rise more slowly than wages, but their share of total production costs being kept constant.<sup>3</sup>

#### **A SCENARIO, NOT A FORECAST**

Projections of public finances based on this definition of an unchanged public sector commitment presuppose active political decisions on spending increases. Grants and social transfers which, in practice or in law, are calculated or set on a nominal basis would otherwise remain unchanged. It should be stressed that the projections of government expenditure should be taken neither as a recommendation nor as a forecast for the future size of the public sector. An unchanged commitment should be seen instead as a calculation assumption for the assessment of long-term sustainability.

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<sup>2</sup> See, for example, Molander (1999) for a general discussion of the different motives for the public sector commitment.

<sup>3</sup> This assumption is further justified and explained in Chapter 3.

## 2.2 Three scenarios analysed

The analysis in this report focuses on a base scenario in which expenditure on government consumption and transfers is consistent with the above definition of an unchanged public sector commitment. The base scenario also builds on an assumption that the average age of exit from the labour market, or retirement age, gradually increases through to 2040 from not quite 64 years today to 65 years (see Table 1). As well as extending their working lives, the elderly are also assumed to be ever healthier. This means that the need for welfare services among the elderly in a given age group decreases gradually over time. These assumptions should be seen in the light of average life expectancy being expected to rise. At the same time, the average age of entry into the labour market is assumed to be constant at current levels.

**Table 1 Overview of scenarios**

	Retirement age	Need for welfare services	Personnel density
Base scenario	Gradually increases	Gradually decreases among the elderly	Constant
Alternative scenario: unchanged behaviour	Unchanged	Unchanged	Constant
Alternative scenario: reduced personnel density	Gradually increases	Gradually decreases among the elderly	Decreases

Unlike the base scenario, an alternative scenario assumes that the retirement age remains the same as today. It is also assumed that the elderly do not become any healthier, but require the same amount of health and social care as they do today at a given age. This scenario, referred to as *unchanged behaviour*, provides an illustration of how much higher government expenditure will need to be if increasing life expectancy affects neither the retirement age nor the need for health and social care among the elderly.

In another alternative scenario, referred to as *reduced personnel density*, the assumption of unchanged personnel density in the provision of welfare services is substituted with the assumption of a gradual decline in personnel density. This results in a gradual erosion of the public sector commitment as defined in this report. That said, the standard of services per user may still increase in this scenario as a result of more capital and inputs per employee. The assumption of reduced personnel density means that government consumption falls as a share of GDP with an unchanged age structure in the population. This implies that citizens' preferences gradually shift away from publicly funded welfare services in favour of private consumption.

## 2.3 Long-term sustainable public finances

### **STABLE NET DEBT IN THE LONG RUN IS AN ESSENTIAL CRITERION**

One criterion for long-term fiscal sustainability is that general government net debt, or net wealth, stabilises as a share of GDP in the long run.<sup>4</sup> This is consistent with satisfying the intertemporal budget constraint – the present value of government revenue is equal to the sum of current net debt and the present value of all future spending.

General government net debt not constantly growing as a share of GDP can be considered an essential condition for fiscal sustainability. With constant growth in the ratio of net debt to GDP, the government would eventually be unable to service the interest on this debt.

Whether debt stabilises in the long run depends on:

- the initial level of net debt
- the difference between the nominal interest rate and nominal GDP growth
- the future primary net lending, i.e. net lending excluding income from capital and interest costs

An initial net debt position implies a need for future primary surpluses to fund interest payments on this debt. The size of these surpluses depends not only on the size of the initial net debt but also on the difference between the nominal interest rate and the rate of GDP growth, known as the interest rate-growth differential. This is because, on the one hand, a higher interest rate means higher interest payments. On the other hand, higher growth means that the ratio of debt to GDP will be reined in by the increase in output. If there is no difference between the interest rate and the growth rate, these effects will cancel each other out – the erosion of the debt-to-GDP ratio due to output growth will be exactly equivalent to the interest payments. In this case, a balanced primary net lending in the long term is a sufficient condition to stabilise the debt-to-GDP ratio.<sup>5</sup>

In the calculations in this report, the interest-rate-growth differential is virtually non-existent. At the same time, the Swedish public sector currently has negative net debt – in other words, net financial wealth – equivalent to almost 20 per cent of GDP. This offers a certain amount of space for persistent primary net lending deficits without reducing net wealth. However, this corresponds to a long-term negative primary net lending of less than 0.1 per cent of GDP. For net wealth to stabilise as a share of GDP, primary net lending must therefore be close to zero in the long run.

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<sup>4</sup> Net debt is the government sector's gross debt less its financial assets. Net debt is the same as net financial wealth with the sign reversed.

<sup>5</sup> That the interest rate corresponds exactly to the growth rate is, of course, a special case, but the difference between them can normally be expected to be limited when cyclical variations are ignored.

## **STABLE NET DEBT IN THE LONG RUN NOT A STRICT SUSTAINABILITY CRITERION**

Net debt stabilising as a share of GDP is not a particularly strict sustainability criterion. Long periods of surpluses or deficits may also be consistent with long-term stabilisation of net debt. Nor does this criterion say at what level debt should stabilise. Applying this criterion, a situation where net debt stabilises at 100 per cent of GDP and one where it stabilises at –100 per cent of GDP are equally sustainable.

An additional criterion, therefore, is that not only must net debt be stable as a share of GDP, but the actual level of the debt-to-GDP ratio must be restricted. This can be justified by the need for leeway in a weak economic climate to pursue stabilisation policies that erode the net position. This means that initial net debt must not be excessive. The level of net debt that can be considered the upper limit is difficult to quantify, however, and no attempt to do so is made in this report. The outlook is studied on the basis of the current level, which is a position of net wealth rather than net debt. The current level of net wealth of almost 20 per cent of GDP is assumed to be the level required for sustainability.

### **NET WEALTH OR GROSS DEBT?**

The restriction that there must be scope for expansionary fiscal policy where required can also be considered to place restrictions on gross debt, since many of the public sector's financial assets may be illiquid in practice.

In its report,<sup>6</sup> the Surplus Target Committee – the government committee tasked with reviewing the surplus target for general government net lending – finds that, in theory, net wealth is more appropriate as a sustainability indicator, but that gross debt is a more common policy restriction internationally. This is explained partly by gross debt being less sensitive to differences in valuation and accounting policies. Financial markets are probably also more interested in the government having low gross debt than in the level of net wealth. One reason for this is that the public sector's financial assets may be illiquid or ring-fenced for specific purposes. For example, most of Sweden's financial assets are in the old-age pension system where they are intended to fund future pensions.

If lenders consider gross debt to be excessive, they may require compensation for risk in the form of a higher interest rate. This can push up the interest rate-growth differential, both through higher interest rates and through the lower growth that may ensue. Such a situation could lead to an unsustainable spiral where a larger interest rate-growth differential leads to increased debt, which in turn pushes risk premiums up further, and so on. It is, however, difficult to gauge at what level Sweden's debt would start to attract substantial risk premiums.

The Surplus Target Committee concludes that gross debt in the consolidated general government sector (Maastricht debt) equivalent to 35 per cent of GDP would be an appropriate anchor. The committee finds it difficult to justify a specific level, but argues that 35 per cent is consistent with the proposed new surplus target of one-third of a percent of GDP.

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<sup>6</sup> Surplus Target Committee (2016).

## **THE EU'S SUSTAINABILITY CRITERIA – S1 AND S2**

The EU uses two different indicators to measure the sustainability of public finances: S1 and S2.

The S2 indicator is calculated in this report. It is based on the intertemporal budget constraint – a budget restriction that captures previous, current and future developments. The long-term sustainability of public finances is evaluated with an infinite horizon. For public finances to be long-term sustainable, it must be possible to fund the public sector's future spending with its future revenue and current net financial wealth.

One difficulty with the S2 indicator is that it is sensitive to the assumptions made about demographics and economic growth, and also to the starting point for the calculations. The S2 indicator is also a static and stylised estimate which assumes that tax increases can be made without impacting on the size of the tax bases. There is, however, reason to believe that the tax bases would change following a sharp rise in taxation, with the result that taxes need to be raised even further than the constant increase indicated by the S2 value. To complement the conventional S2 indicator, the NIER also estimates a variant that takes some account of this effect, which we call S2+.

The S1 indicator, on the other hand, is a measure of the extent to which public finances need to be tightened so that a country's general government gross debt does not become excessive. Rising gross debt as a share of GDP may be a sign that public finances are headed in an unsustainable direction in the longer term. The European Commission starts with the ceiling for gross debt set in the Growth and Stability Pact of 60 per cent of GDP, and currently has 2027 as the final year when debt must not exceed this level. No S1 value is calculated in this report because gross debt is already below 60 per cent of GDP. The report does, however, look at how gross debt performs relative to the proposed new debt anchor of 35 per cent of GDP.

## 3 Demographic and macroeconomic developments

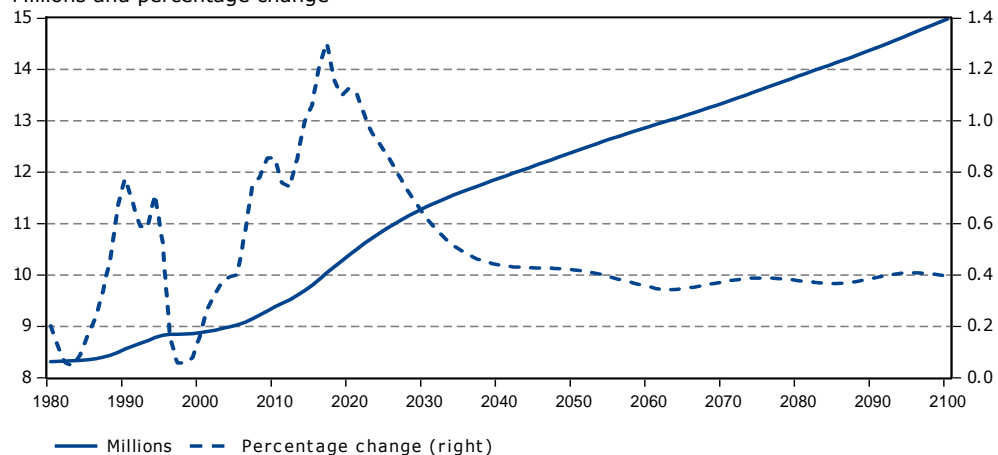
This chapter looks first at demographic developments, which have a major bearing on an assessment of fiscal sustainability. It also explains the macroeconomic projections and the assumptions made about the labour market through to 2100. In the short term, through to 2021, the scenario for the macroeconomy and the labour market is based on the NIER's December 2016 forecast. The projections after that have been produced using the NIER's long-term structural models. Finally, the chapter presents the assumptions underlying the projections of government consumption.

### 3.1 Demographic developments

According to Statistics Sweden's autumn 2016 population forecast, the Swedish population will grow from 9.9 million in 2016 to 11.9 million in 2040 and 15.0 million in 2100.<sup>7</sup> This means that the population is set to expand by around 20 per cent between now and 2040. Over the next five years, Statistics Sweden anticipates population growth of just over 1 per cent per year (see Diagram 1). This rapid increase over the next few years is due mainly to asylum seekers.

**Diagram 1 Sweden's population**

Millions and percentage change



Source: Statistics Sweden.

#### **GROWING SHARE OF ELDERLY PEOPLE**

The age structure of the population generally has a greater bearing on government net lending than a population increase in itself.

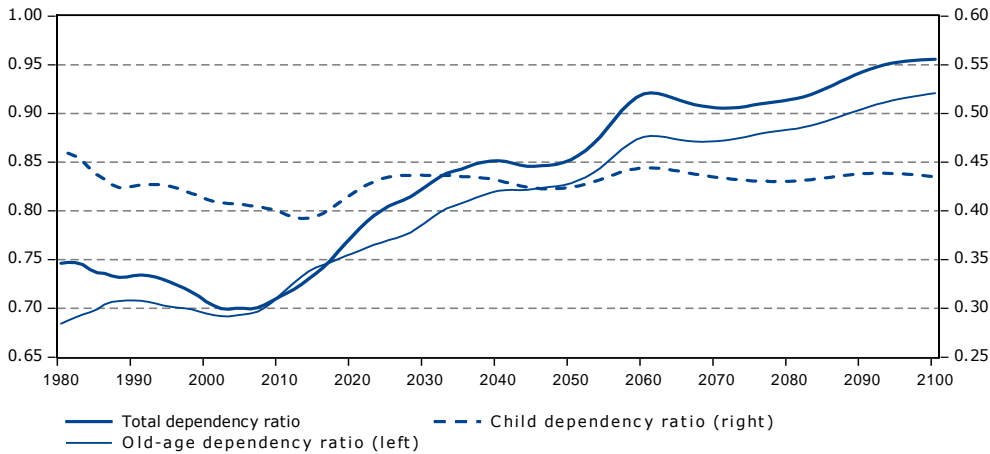
The demographic dependency ratio shows the number of young and old in relation to the number of people of working age (defined here as ages 20–64). A low ratio means a favourable population structure in terms of age. The demographic dependency ratio

<sup>7</sup> The population forecast underlying this report is the updated forecast commissioned by the Ministry of Finance in October 2016. The figures are estimated annual means.



in Sweden began to fall in the 1980s and continued to decline until a few years into the new millennium. It has since risen again, and Statistics Sweden’s population forecast suggests that it will trend upwards for the rest of the century (see Diagram 2). In 2005, the demographic dependency ratio was 0.70, which means that there were 70 young and old people per 100 of working age. The ratio is now forecast to climb to 0.85 in 2040 and 0.96 in 2100.

**Diagram 2 Demographic dependency ratio**



Note: The demographic dependency ratio refers here to the ratio between the number of people who are not of working age to the number of people who are. Working age is defined here as 20–64 years. The diagram shows the total dependency ratio divided into the child dependency ratio (the number of people aged 0–19 relative to the working-age population) and the old-age dependency ratio (the number of people aged 65 and over relative to the working-age population).

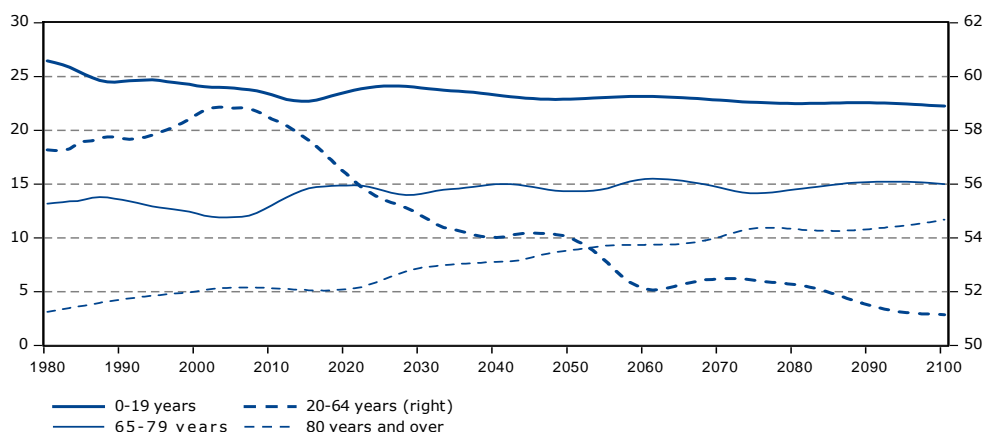
Source: Statistics Sweden.

It is largely a growing elderly population that will push up the dependency ratio, but the child dependency ratio is also expected to rise appreciably over the next decade.

The old-age dependency ratio, which is the ratio of over-65s to the population aged 20–64, is forecast to rise from 0.34 today to 0.52 in 2100. It is especially those aged 80 and over who will increase as a share of the population (see Diagram 3). The over-80s are set to climb from around 5 per cent of the total population today to almost 8 per cent in 2040 and almost 12 per cent in 2100. The 65–79 age group is expected to continue to make up around 15 per cent of the population.

**Diagram 3 Age structure of the population**

Percentage of total population



Source: Statistics Sweden.

## 3.2 Labour market assumptions

The NIER's forecast of further strong economic performance in the coming years means that the labour force participation rate and the employment rate will rise somewhat, while the unemployment rate will fall further to 6.5 per cent in 2021.<sup>8</sup>

The projections for the labour market after 2021 are based on the NIER's long-term labour market model KAMEL along with the NIER's assessment of how the labour market will develop. In KAMEL, labour market variables are influenced by changes in the structure of the population in terms of gender, age and origin.<sup>9</sup> Different population groups have different characteristics, including participation rates, employment rates and average hours worked by those who are employed. These characteristics are generally expected to persist in the model's projections.<sup>10</sup> Non-Europeans, who have a relatively low employment rate, grow relative to other groups in the population through to the early 2030s, pulling down the overall employment rate. On the other hand, the employment rate is propped up by continued positive effects from previous labour market measures. This means that the employment rate in the 15–74 age group after 2021 remains fairly constant at just over 67 per cent through to 2030. The employment rate then begins to trend upwards after 2040, reaching 72 per cent in 2100. This trend is the result of assuming a rising retirement age, as discussed in more detail below.

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<sup>8</sup> NIER (2016b).

<sup>9</sup> In this model, 480 different groups in the labour market are defined on the basis of gender, 60 age groups (15–74 years) and four categories of origin (Sweden, other Nordic, other European and non-European).

<sup>10</sup> KAMEL uses 2015 as the base year for its demographic projections. This means that there is a slight discrepancy between the participation and unemployment rates in KAMEL and the assessment of the labour market presented in *The Swedish Economy* in December 2016. The labour market variables used in the sustainability calculations are based on KAMEL but calibrated to reflect the December 2016 forecast. See the special analysis "Utvecklingen på arbetsmarknaden på lång sikt" [The long-term outlook for the labour market] in NIER (2016b) for a description of the effects included in the sustainability estimates as a result of this calibration.

## **RISING LIFE EXPECTANCY POINTS TO A LONGER WORKING LIFE**

In the long run, the base scenario for the labour market is based almost entirely on demographic projections. No structural changes are assumed to affect the labour market beyond the increase in the duration of working life described below.

The age at which people exit the labour market, or retirement age, is expected to rise gradually, while the age at which they enter the labour market is kept constant.<sup>11</sup> The assumption of a rising retirement age can be viewed as a gradual “rejuvenation” of the over-60s’ labour market behaviour by four years in the period through to 2100. This means that 60-year-olds in 2100 will, on average, behave like 56-year-olds today in terms of participation rate, employment rate, hours worked and so on. It also means that the average retirement age is assumed to increase by four years by 2100 from its current level of 64 years. By 2040, the average exit age is assumed to have risen by slightly more than one year.<sup>12</sup>

The assumption of a rejuvenation of behaviour in the labour market is due mainly to Statistics Sweden’s forecast for life expectancy. Today, the life expectancy of a 65-year-old is just over 20 years. This increases to almost 23 years in 2040 and just under 27 years in 2100 in Statistics Sweden’s forecast. The base scenario assumes that part of this increase in life expectancy comes in the form of healthy, active years. It is therefore expected to go hand-in-hand with a longer working life.

If a 65-year-old has a life expectancy of 20 years, this means that, on average, people’s retirement is roughly half as long as their working life. The assumption of a rejuvenation of behaviour by four years through to 2100 means that the balance between the duration of working life and retirement is kept fairly constant.<sup>13</sup>

A rising average retirement age would also be a continuation of an existing trend. Labour force participation in the 55–64 age group has been trending upwards since the 1970s. Until the early 1990s, this was due to higher participation rates among women. Since then, participation has increased among both men and women in that age group. Participation in the 65–74 age group has risen among both men and women since at least 2001, when Statistics Sweden again began to include this age group in its Labour Force Survey. One in six people in this age group participated in the labour market in 2015, against one in ten in 2001. The higher participation rates in these age groups have contributed to an increase in the average retirement age of almost two years since the late 1990s.

## **LONGER WORKING LIFE WILL HELP REIN IN THE ECONOMIC DEPENDENCY RATIO**

The assumption of a rejuvenation of behaviour among older people in the labour market means that the participation rate in the 65–74 age group rises from 17 per cent

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<sup>11</sup> A rising labour market exit age is in keeping with the latest Long-term Survey of the Swedish Economy, where the base scenario assumes that growing life expectancy leads to a higher retirement age, see Long-term Survey of the Swedish Economy (2015).

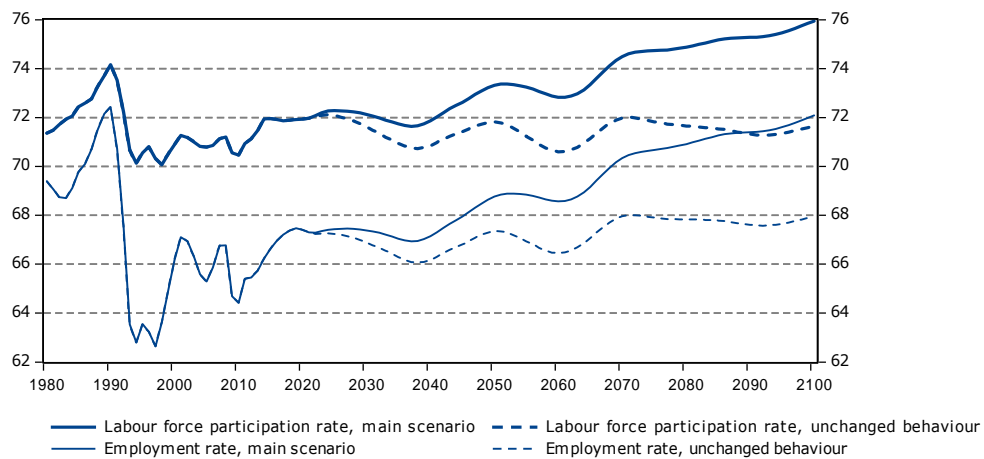
<sup>12</sup> This assumption contrasts with the alternative scenario with unchanged behaviour, in which labour market behaviour is constant in all age groups throughout the projection period.

<sup>13</sup> The increase in retirement age in the base scenario as a result of the assumption of a rejuvenation of behaviour coincides to a large extent with developments in the guideline retirement age proposed by the Retirement Age Commission. See Retirement Age Commission (2013) and NIER (2015).

in 2015 to 23 per cent in 2040 and 40 per cent in 2100. In the 15–74 age group as a whole, the assumption of a rejuvenation of behaviour means that the participation rate and the employment rate are around 4 percentage points higher in 2100 than with unchanged behaviour. Through to 2040, the effect of this assumption is to push the participation and employment rates up by around 1 percentage point (see Diagram 4).

**Diagram 4 Labour force participation rate and employment rate, ages 15–74**

Percentage of population aged 15–74



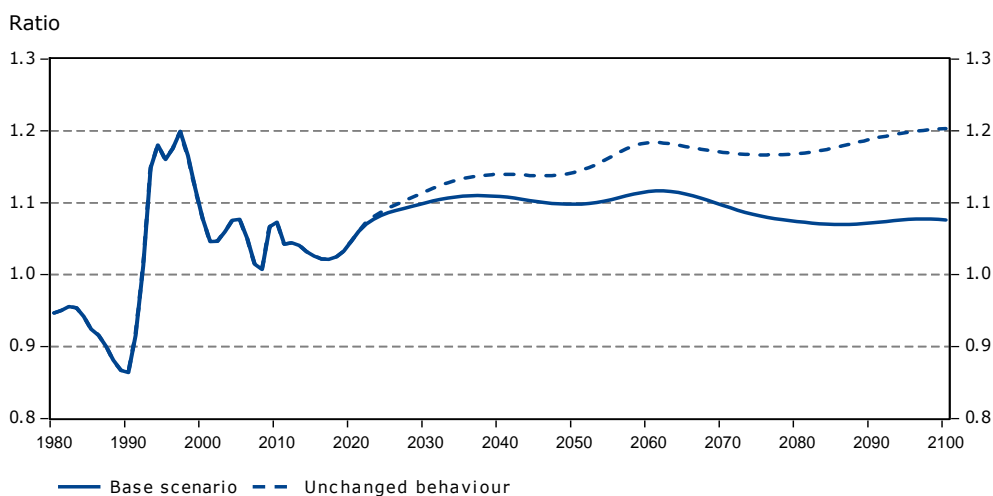
Sources: Statistics Sweden and NIER.

In the base scenario, the participation rate is largely the same in 2040 as it is today at around 72 per cent. An increase in participation among older people is counteracted over this horizon by an increase in non-Europeans with a lower participation rate.<sup>14</sup> After 2040, the participation rate rises due to further increases in participation among older people and relatively rapid growth in other groups with high participation rates. The employment rate – the number of employed relative to the population of working age – follows a similar path.

The economic dependency ratio reflects the dependency burden on the working population better than the demographic dependency ratio. The economic dependency ratio is defined as the ratio between the number of economically inactive (non-working) people in the population and the number of employed. This ratio is currently just over 1.0, which means that there are roughly equal numbers of economically active and inactive people. The ratio will rise relatively quickly over the next few years to 1.1 as a result of the number of economically inactive in the population rising faster than the number of employed. After 2030, the ratio is more or less unchanged. If the retirement age is instead kept constant, as in the alternative scenario with unchanged behaviour, the economic dependency ratio continues to climb throughout the projection period to 1.2 in 2100 (see Diagram 5).

<sup>14</sup> Account is taken of higher immigration than normal resulting in new arrivals making up a larger share of the non-European population. Because new arrivals initially have a lower participation rate, this impacts on the average participation rate. Once they have spent more time in Sweden, the participation rate in the non-European population can be expected to rise. After 15 years, the participation rate is assumed to be the same among those now arriving in Sweden as for the non-European population as a whole.

**Diagram 5 Economic dependency ratio**



Note: The economic dependency ratio is the ratio between the number of economically inactive (non-working) people in the population and the number of employed.

Sources: Statistics Sweden and NIER.

### 3.3 The long-term outlook for the economy

The positive output gap is assumed to continue to widen for the next couple of years before narrowing again.<sup>15</sup> The long-term macroeconomic scenario for 2022 onwards is based on the simplified assumption that the economy operates at capacity. GDP growth is then determined by demographically driven developments in hours worked and the technological advances that, together with capital formation, give aggregate productivity growth.<sup>16</sup>

#### **SLIGHTLY LOWER PRODUCTIVITY GROWTH**

The annual rate of productivity growth in the economy as a whole has averaged 1.7 per cent per year since the early 1980s but is expected to be slightly lower through to 2040 (see Table 2). This is due to increased demand in the public sector suppressing other sectors with higher productivity growth.

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<sup>15</sup> NIER (2016b).

<sup>16</sup> The NIER's macroeconomic model KAVEL is used to calculate developments in the components of demand. KAVEL is described in more detail in "Appendix 1: Further information on the macroeconomic scenario" in NIER (2016a).

**Table 2 Hours worked, productivity and GDP**

Average annual percentage change

	1981–2015	2016–2040	2041–2100
Population	0.5	0.8	0.4
Labour force	0.5	0.6	0.4
Employment	0.4	0.6	0.4
Hours worked	0.5	0.6	0.4
Productivity	1.7	1.5	1.6
GDP, constant prices	2.2	2.1	2.0
Household consumption	1.9	2.5	2.3
Government consumption	1.2	1.4	0.9
GDP per capita, constant prices	1.7	1.3	1.6
GDP, current prices	5.8	4.3	4.3

Note: Values for 2016–2040 and 2041–2100 are those estimated for the report's base scenario.

Sources: Statistics Sweden and NIER.

Hours worked increase at slightly above the historical average rate through to 2040 but then slow to slightly below the average rate for the past 35 years. GDP growth, which is approximately the sum of growth in hours worked and growth in productivity, is slightly below the historical average through to 2040.

#### DEMAND DRIVEN BY DEMOGRAPHICS

As discussed in more detail in the next section, government consumption is assumed to be driven mainly by demographic developments. A rising dependency ratio, together with the assumption of an unchanged personnel density in the provision of welfare services, means that a growing share of hours worked in the economy is used for the production of welfare services. Together with the assumption that personnel costs make up a constant share of consumption expenditure, this means that government consumption trends upwards as a share of GDP through to the end of the 2030s in the base scenario (see next chapter).

Investment in the economy has been projected such that the capital stock in current prices is constant relative to nominal GDP.

Household consumption is assumed to rise with population growth and the increase in standards made possible by productivity growth. In the base scenario, household consumption per capita grows by 1.7 per cent per year through to 2040, which is somewhat more than the historical average of 1.4 per cent per year in 1981–2015.

Coming demographic developments entail a shift in the population away from a high share of middle-aged people, who have a high propensity to save, in favour of elderly people, who save less. This motivates lower net lending to the rest of the world and is expressed by a decline in net exports as a share of GDP. Net exports therefore trend down until the mid-2030s and then hold around 1 per cent of GDP on average through to 2100. The (primary) current account surplus is motivated by the sum of EU contributions and development aid being assumed to correspond to roughly this level.

The total return on financial assets is assumed to be 4.5 per cent per year in the long run. Interest rates are currently lower than they have been historically. The interest rate path used in the calculations is based on interest rates normalising over the next decade such that all interest rates are 4.5 per cent in 2027.<sup>17</sup> The return on equities is also 4.5 per cent after 2027, breaking down into a 2.5 per cent dividend yield and 2.0 per cent capital appreciation. Inflation is estimated to be 2.0 per cent in the long run, giving a real return of 2.5 per cent.

A country's financial position can normally be assumed to affect the interest rate at which the public sector can borrow. Healthy public finances with annual surpluses and low gross debt are rewarded with low interest rates in capital markets. The calculations in this report ignore this relationship, and interest rates move independently of the public sector's financial position.

### 3.4 Assumptions for government consumption

#### **GOVERNMENT CONSUMPTION IS MOSTLY INDIVIDUAL CONSUMPTION**

Consumption is the category of expenditure in the government budget that is affected most by demographic changes. Assumptions for government consumption are therefore important in an analysis of long-term fiscal sustainability.

Government consumption can be divided into two types: individual and collective. Individual government consumption is consumption that can be attributed to a specific user and so includes the bulk of welfare services. It can be divided broadly into health, education and social protection based on the standard Classification of the Functions of Government (COFOG). Each of these categories accounts for almost a quarter of government consumption. Social protection consists primarily of elderly care, but also includes children's homes, after-school child care, daytime child care and active labour market programmes. Collective consumption, on the other hand, is consumption that cannot be attributed to specific users but is predominantly a collective good. This includes spending on the police and defence.

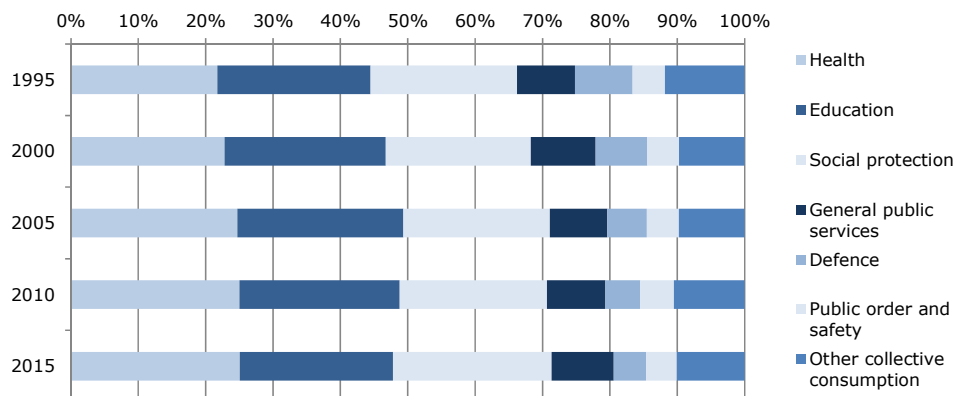
The ratio between individual and collective consumption has been stable over the past decade, with individual consumption accounting for around 70 per cent of total government consumption (see Diagram 6). Prior to this, there was a shift towards a lower share of collective consumption, due mainly to reduced defence spending.

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<sup>17</sup> The special analysis "Low real interest rates mean weaker public finances" in Chapter 7 describes the effect on public finances of an alternative path for interest rates where returns do not reach 4.5 per cent until 2040.

**Diagram 6 Government consumption by purpose, 1995–2015**

Percentage of government consumption



Note: The three left-hand categories make up individual government consumption, while the remaining categories constitute collective government consumption.

Sources: Statistics Sweden.

### AVERAGE COST OF WELFARE SERVICES HIGHEST AMONG THE ELDERLY

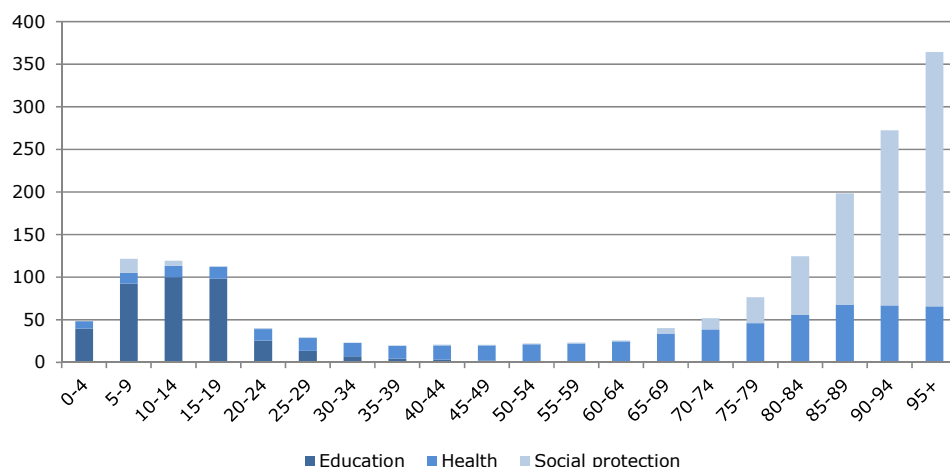
The projections of government consumption assume that collective consumption moves with overall population growth. Individual consumption is projected on the basis of developments in different age groups in the population, as the consumption of individual welfare services varies considerably with age.

Diagram 7 shows the average cost per person and age group for the three categories of individual government consumption – health, education and social protection – based on Statistics Sweden’s estimates. With children and young people, education accounts for the bulk of the cost of government consumption. Among the working-age population, spending on welfare services is relatively low on average. The average cost per individual for individual government consumption picks up from the age of 65. This is due mainly to costs for elderly care now being incurred and increasing with age. Health care costs also pick up from the age of 65 but are unchanged after the age of 85. It is the elderly who account for the highest average cost. Compared to a child of school age, the average cost is twice as high for a person in the 90–94 age group and three times as high for those aged 95 and over.



**Diagram 7 Average cost of individual government consumption per person and age group, 2014**

SEK thousand per year



Note: Costs estimated by Statistics Sweden on the basis of survey data and database sources. Summing these costs for the population in each age group will not fully correspond to the total cost of individual government consumption in the national accounts for that year.

Sources: Statistics Sweden.

As stated above, the share of elderly people in the population is expected to increase in the coming decades (the old-age dependency ratio will rise), especially those aged 80 and over. The impact on government consumption will be particularly great when this group grows, because the average cost in this group is much higher than for young people.

#### **ELDERLY ASSUMED TO BE EVER HEALTHIER**

The need for welfare services is assumed to be constant over time among the under-65s. This means that people in each age group below the age of 65 are assumed to make the same use of welfare services in the future as they do today (see Diagram 7). However, it is assumed that the elderly will become more and more healthy as life expectancy grows. The life expectancy of a 65-year-old is expected to increase by almost seven years by 2100. It is assumed that the over-65s will become five years healthier during the same period.<sup>18</sup> This means that the average 70-year-old in 2100 is assumed to need the same volume of individual government consumption as today’s 65-year-old, the average 75-year-old in 2100 will have the same needs as today’s 70-year-old, and so on. By 2040, the degree of “rejuvenation” of behaviour is 1.5 years. This assumption means that elderly people in each age group use fewer and fewer welfare services as time goes on, but still use more welfare services in total during their lifetime than they do today because of the increase in life expectancy. At the same time, the assumption of unchanged personnel density means that each user will still encounter the same personnel density.

<sup>18</sup> See NIER (2016a) for a discussion of the empirical support for this assumption.

## **UNCHANGED PERSONNEL DENSITY PERMITS A CERTAIN INCREASE IN STANDARDS**

The definition of unchanged personnel density in government consumption is that citizens encounter the same number of staff and the same standard of welfare services regardless of how the composition of the population changes over time. This means that government consumption is projected on the basis of the demographic need including a certain increase in standards.

The demographic need is defined as the cost of collective and individual public services given the composition of the population. In other words, the demographic need shows how government consumption will change solely on the basis of how much different age groups grow. This measure does not therefore include any increase in standards.

The standard of welfare services, which can also be viewed as a measure of productivity, is not a well-defined concept. The size of the increase in standards depends partly on the assumption that personnel costs make up a constant share of total government consumption. Historically, personnel costs have made up around two-thirds of the total cost of government production, with relatively little variation.<sup>19</sup> In addition, prices for capital goods and other inputs for the production of welfare services are assumed to rise more slowly than wages. This means that, over time, staff will have more and/or better capital goods and other inputs to work with, which means that each worker will be able to produce more. The NIER's calculations based on these assumptions give an increase in standards of 0.6 per cent per year. This means that the projections of government consumption with unchanged personnel density, as defined in this report, include an increase in standards of 0.6 per cent per year. The projections also assume that this increase in standards benefits users rather than providers (that is, the public sector).

The NIER estimates that the average increase in standards in government consumption has been around 0.6 per cent per year since 1995.<sup>20</sup> Diagram 8 shows how the volume of government consumption has outgrown the demographic need. The difference between the two illustrates the increase in standards defined above. These calculations are, however, sensitive to the time period chosen. For example, the increase in standards is somewhat smaller if we include the early 1990s, when government consumption growth was weak as a result of austerity measures in response to the crisis of the time.

It should be noted that actual movements in government consumption, as it is measured, do not capture any quality-adjusted productivity. The increase in volumes is based more, for example, on the relationship between the number of teachers and pupils, or the number of patients and medical staff, than on skills development and better health. Nor do these calculations show whether the increase in standards is due

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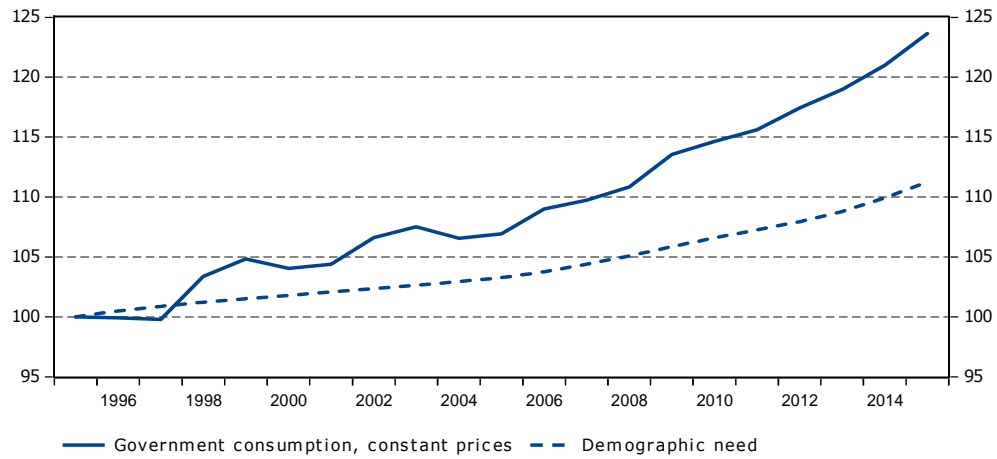
<sup>19</sup> Government consumption also includes goods and services produced in the private sector. The share of personnel costs in government production does, however, provide an idea of the distribution of costs in the overall production of goods and services consumed by the government sector.

<sup>20</sup> This is based on government consumption in constant prices having increased by 24 per cent cumulatively from 1995 to 2015, and the demographic need by 11 per cent. Over the period as a whole, consumption increased by 12 per cent, or 0.6 per cent per year, more than the demographic need. This estimate is based on users' needs having been constant during the period and is therefore sensitive to the choice of reference year (our calculation here are based on information for 2014 as presented in Diagram 7).

to increased personnel density or increased use of capital goods and other inputs per user.

**Diagram 8 Government consumption and demographic need**

Index 1995=100



Note: The demographic need is calculated as the cost-weighted number of inhabitants based on average costs per age group in 2014 (see Diagram 7).

Sources: Statistics Sweden and NIER.

## 4 Public finances until 2040

This chapter looks at how public finances develop through to 2040 in the report's base scenario, given the demographic and macroeconomic developments presented in the previous chapter.

In this scenario, both primary revenue and primary expenditure increase somewhat as a share of GDP in the period through to 2040. Expenditure is driven mainly by demographic changes, with an increasing share of young and elderly. Revenue increases partly as a result of household consumption – and so value-added tax revenue – growing slightly more quickly than GDP. Taking together, this results in general government primary net lending deficits. These deficits are also sufficiently large that net wealth trends downwards, which means that public finances cannot be considered sustainable through to 2040. Sustainability would require the tax-to-GDP ratio to be an average of 0.4 percentage points higher through to 2040.

### 4.1 Primary revenue and expenditure: an overview

#### **TAXES AND DUTIES ACCOUNT FOR THE BULK OF GOVERNMENT REVENUE**

Government revenue consists almost entirely of taxes and duties, which amount to around 43 per cent of GDP. Capital income in the form of interest and dividends adds just over 1 per cent of GDP.<sup>21</sup>

#### **CONSUMPTION MAKES UP JUST OVER HALF OF GOVERNMENT EXPENDITURE**

Government expenditure comprises consumption, investment and various types of transfers (see Diagram 9). Consumption makes up slightly more than half of this expenditure and can be divided in turn into individual and collective consumption.<sup>22</sup> Transfers to households amount to almost a third of government expenditure. Income pensions through the old-age pension system account in turn for around half of these transfers. Government investment makes up just under a tenth of total expenditure, while the final tenth consists of business subsidies, EU contributions, international aid and interest costs.

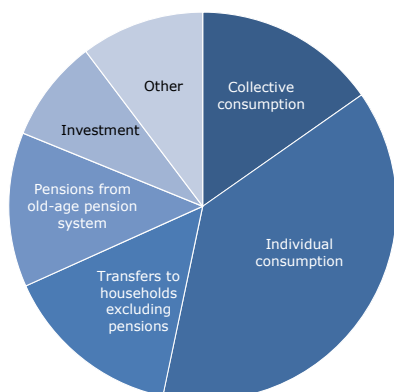
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<sup>21</sup> The national accounts also include revenue of an accounting nature, with the result that total government revenue exceeds tax revenue and capital income by a few percent of GDP.

<sup>22</sup> Individual consumption comprises services that can be attributed to a specific individual, such as education, health and elderly care. Collective consumption consists instead of collective services such as justice, defence and maintenance of the national road and rail networks. The local government sector – municipalities and county councils – accounts for the bulk of individual consumption, while the central government sector accounts for most collective consumption (see section 3.4).

**Diagram 9 Government expenditure in 2015**

Percentage of total government expenditure



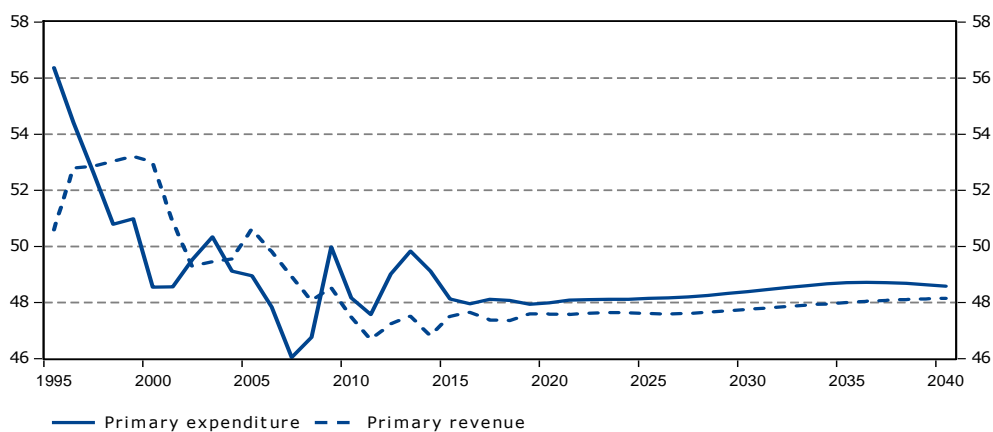
Source: Statistics Sweden.

**PRIMARY REVENUE AND EXPENDITURE HAVE BEEN FALLING FOR A LONG TIME**

General government primary expenditure amounted to 49 per cent of GDP in 2015 (see Diagram 10). The expenditure-to-GDP ratio exceeded 60 per cent for a few years in the 1990s but rapidly fell back in the wake of austerity measures and economic recovery in the second half of the decade. The ratio has continued to edge down since the turn of the millennium.

**Diagram 10 Primary revenue and expenditure**

Percentage of GDP



Source: NIER.

It is mainly transfers and other expenditure that have decreased. In the early 1990s, spending on non-pension social transfers, such as unemployment and sickness benefits, amounted to 15 per cent of GDP. The figure today is only half that. The decrease can be explained by a smaller number of full-year equivalents in the 20–64 age group being supported by social security benefits, and by a lower replacement rate in several transfer systems.

The decline in other expenditure is due chiefly to housing subsidies having been largely abolished as part of the austerity measures of the 1990s. Interest on the national debt also made up a substantial slice of government expenditure in the 1990s, but has

since trended downwards due to the decline in both central government debt and interest rates. Only spending on welfare services has increased over time as a share of GDP.

Primary revenue has been falling for a long period. The tax-to-GDP ratio decreased by almost 4 percentage points from 1995 to 2014, due primarily to the introduction of tax credits for the basic pension contribution and earned income. In 2015 and 2016, the tax-to-GDP ratio rose slightly again as a result of tax increases.

## 4.2 General government consumption

### DEMOGRAPHIC DEVELOPMENTS DRIVE GOVERNMENT CONSUMPTION

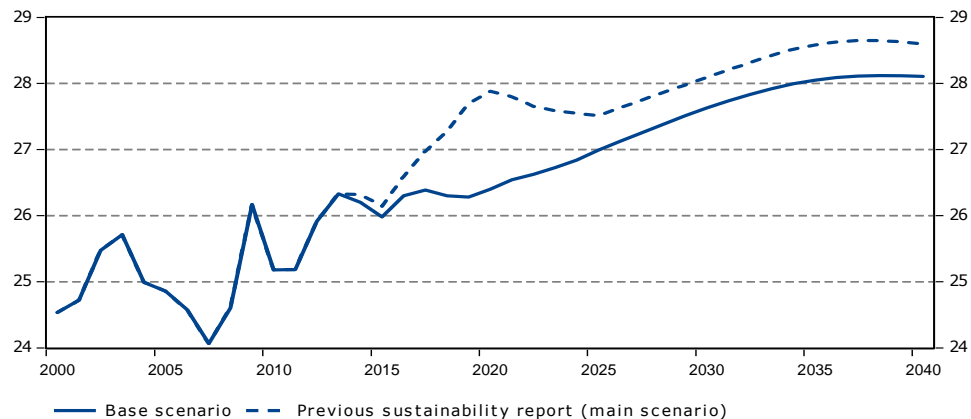
In the expenditure projections, government consumption grows from 26 per cent of GDP in 2015 to 28 per cent in 2040.

The increase in volume terms is comparatively high in 2015–2017, mainly as a result of the high number of asylum seekers, particularly in autumn 2015. Other components of GDP are also growing strongly, however, which means that there is a much more modest rise in government consumption as a share of GDP (see Diagram 11). The asylum seekers arriving in Sweden in 2015 will mainly affect expenditure in 2016 and 2017. Given far fewer new asylum seekers after 2015 and various changes in the reception system, including new reimbursement arrangements for the municipalities, spending on refugee reception will fall after 2017. This will cause a minor temporary decline in government consumption as a share of GDP.

Government consumption in the near term has been sharply revised from last year's sustainability report, which was based on the assumption of a continued rapid influx of refugees over a number of years. The downward revision in the longer term is due to a smaller population with a different age structure, but in the near term it is due principally to lower spending on refugee reception. This is discussed further in Chapter 5.

**Diagram 11 Government consumption**

Percentage of GDP



Sources: Statistics Sweden and NIER.

The projections of government consumption are closely related to changes in the demographic dependency ratio, as shown in section 3.1. A growing proportion of young people and, above all, a rapidly growing share of elderly people in the population mean that government consumption is expected to rise considerably in the future (see section 3.4 on the average cost by age category). This effect will, however, be offset to some extent by the assumption that the elderly will also be ever healthier. When comparing specific age groups, the elderly will therefore have a reduced need for welfare services in the future. Given that life expectancy is also set to rise, the total need for welfare services will still increase despite the improvements in health. Government consumption will increase even further if the elderly do not actually become more healthy as assumed here, as discussed in more detail in Chapter 6 in the alternative scenario of unchanged behaviour.

#### **MAJOR NEED FOR PERSONNEL – ESPECIALLY IN ELDERLY CARE**

The demographic outlook spells not only financial challenges for the public sector but also recruitment challenges. The need for personnel will rise in line with the demographic need.<sup>23</sup> This report is based on the assumption of unchanged personnel density and on there not being any supply problems that make this difficult to achieve in practice. It is thus assumed that the need for recruitment will be met. It is worth noting, however, that the need for additional personnel is particularly high through to 2040, especially in elderly care.

Government consumption as a share of GDP will increase by 2 percentage points from 2016 to 2040, corresponding to volume growth of 39 per cent. This translates into an increase in personnel, or more specifically the number of publicly funded hours worked, of 25 per cent.<sup>24</sup> This can be compared with an increase of 13 per cent in the need for personnel since 1993. Hours worked in the economy as a whole will increase by 14 per cent from 2016 to 2040. Since the increase in the need for personnel in the provision of publicly funded services is greater than the increase in the total number of hours worked in the economy, the share of publicly funded hours worked will rise by just over 2 percentage points by 2040.

The need for additional personnel is especially high in social protection, in particular care for the elderly. A personnel increase of almost 47 per cent will be needed by 2040 to maintain an unchanged personnel density (see Table 3). This increase takes account of the assumption that the elderly will become healthier with time. If this does not happen, and the elderly have an unchanged need for welfare services, the need for additional elderly care personnel will increase further.

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<sup>23</sup> The need for personnel is defined in this report as the change in publicly funded hours worked, regardless of whether production takes place in the public or the private sector.

<sup>24</sup> The reason why the need for personnel does not increase as much as consumption is that part of the volume growth stems from the increase in standards, which is used for more and/or better capital goods and other inputs (see section 3.4).

**Table 3 Need for personnel for publicly funded services**

Percentage change

	1993–2015	2016–2040
<b>Government consumption, volume</b>	<b>22.9</b>	<b>38.7</b>
<b>Need for personnel</b>	<b>13.1</b>	<b>25.1</b>
<i>Purpose</i>		
Health	16.8	25.3
Education	5.5	22.0
Social protection	30.4	46.5
Collective consumption	12.4	19.8
<i>Subsectors</i>		
Municipalities	12.4	29.8
County councils	16.5	25.0
Local government, total	13.8	28.2
Central government	11.7	17.8

Note: The period from 1993 to 2015 is a period of 22 years, which is two years shorter than the projection period.

The need for personnel is defined in this report as the change in publicly funded hours worked resulting from the demographic need, regardless of whether production takes place in the public sector or the private sector. The figures for 1993–2015 show the increase in the need for personnel rather than the increase in actual personnel.

Sources: Statistics Sweden and NIER.

## 4.3 General government investment

### DEMOGRAPHIC CHANGES ALSO INCREASE THE NEED FOR LOCAL GOVERNMENT INVESTMENT

Buildings, plant and other physical equipment are in many cases a necessary complement to personnel in the production of welfare services and collective goods. If the need for teachers grows by 10 per cent during a particular period, it is reasonable to assume that the need for classroom space will also grow by 10 per cent during that period. The relationship between the need for personnel and real capital is not as clear for all welfare services. For example, it is not a given that the big increase in the need for personnel to provide care for the elderly will be matched by an equivalent need for investment in the elderly care sector – in other words, the capital stock will not need to grow in line with the number of staff. This is because elderly care is increasingly being provided in the home.

The projections assume that local government investment expenditure grows at the same rate as demographically driven local government consumption.<sup>25</sup> Since local government consumption accounts for a growing share of GDP in the projections, local government investment will also increase slightly relative to GDP, from 2.3 per cent in 2016 to 2.5 per cent in 2040. Since central government's commitment is characterised more by collective goods that benefit both citizens and the business sector,

<sup>25</sup> This implies a slightly increasing real capital stock per municipal employee, as the price of investment goods rises more slowly than wages. The focus of the estimates in this report is on movements in investment and depreciation, which are included in net lending. These are therefore projected in such a way that the capital stock moves approximately with demographic changes.



central government investment is assumed to rise in line with GDP. Taken together, this means that general government investment climbs from 4.3 per cent of GDP in 2016 to 4.6 per cent in 2040.

## 4.4 General government transfers

Government transfers will continue to decline from 18 per cent of GDP in 2015 to 16 per cent in 2040. Both pension payments and social transfers will grow more slowly than output.

The major influx of refugees in 2015 will affect social transfers to a much lesser extent than government consumption. Transfers will only be affected once asylum seekers receive residence permits and satisfy the criteria for receiving social security benefits, which can take a year or two.

The long-term projections for transfers other than pensions are based on benefits rising in line with wages. The proportion of the population in receipt of benefits is also assumed to be constant in the various age groups that are potentially entitled to the different forms of support.<sup>26</sup> Labour market benefits are assumed to follow the number of unemployed.<sup>27</sup>

### **FALLING INCOME PENSIONS**

From 2000 to 2015, payments from the old-age pension system averaged 6 per cent of GDP. This figure falls slightly in the projections despite an increase in the number of elderly. The pensions paid to existing pensioners each year will rise more slowly than wages, which move with GDP.<sup>28</sup> When guaranteed pensions are included, pension payments still fall as a share of GDP (see Diagram 12). If premium pensions are included too, however, pension payments rise as a share of GDP. However, the premium pension system is not part of the government sector in the national accounts.

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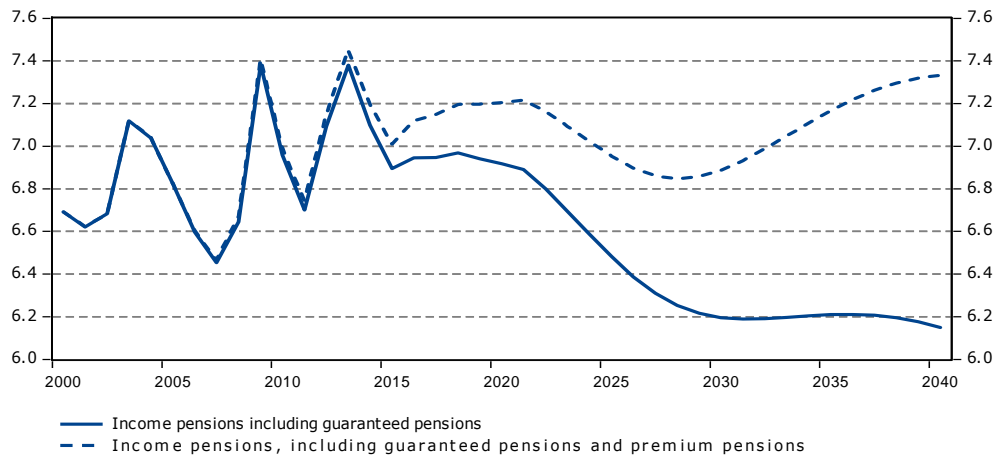
<sup>26</sup> The assumption of a rising retirement age in the base scenario means that old-age pensions are drawn later.

<sup>27</sup> Up to and including 2021, movements in the number of recipients of benefits in each insurance system are based on the NIER's December 2016 forecast, see NIER (2016b).

<sup>28</sup> The indexation of pensions in the old-age pension system (income pensions) is based on average income growth less 1.6 percentage points. This deduction finances a higher initial income pension in return for lower increases later on.

**Diagram 12 Income pensions and premium pensions**

Percentage of GDP



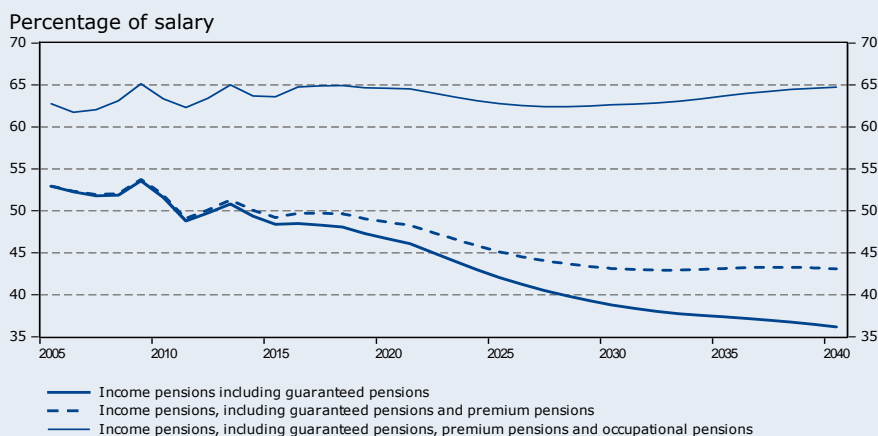
Sources: Statistics Sweden and NIER.

### Falling replacement rate in the old-age pension system

The old-age pension system is designed to be long-term sustainable in the financial sense. This means that the system's future pension payments are to be financed by future contributions and the financial wealth in the system. This financial wealth comprises the national pension funds (AP funds 1–4 and 6), collectively known as the buffer funds. The system is financially sustainable if the present value of all future contributions and the value of the buffer funds together exceed the present value of all future pension payments. The old-age pension system is equipped with a balancing mechanism. If the balance ratio falls below 1 – the pension system's obligations exceed its assets – a “brake” is activated to ensure the system's long-term financial balance. This mechanism means that the upward indexation of pension payments is suspended. Pension obligations then rise more slowly, and the pension system is reinforced. Any surpluses arising during a balancing period are used directly to increase pension payments. This restores the value of the pensions. Due to the financial crisis, the brake has been activated since 2010 as a result of a drop in the value of the buffer funds, but it is expected to be released in 2018.

While the old-age pension system is thus financially sustainable, the replacement rate in the pension system – pension benefits as a share of final salary – is set to fall. As life expectancy increases, the pension rights accrued will need to be spread across more and more years. In the base scenario, the retirement age, currently just under 64 years, increases by almost 1.5 years by 2040, equivalent to two-thirds of the assumed increase in life expectancy. Despite this behavioural change, the replacement rate in the pension system falls through to 2040 (see Diagram 13). The increase in the retirement age in the base scenario is not therefore sufficient to maintain the replacement rate in the income pension system.

**Diagram 13 Pension payments**



Note: Pensions as a percentage of wages are calculated as average pension payments per pensioner in relation to average wages (total wages/number of employed aged 15–74).

Sources: Statistics Sweden and NIER.

To obtain a picture of average income growth for pensioners, account must also be taken of pensions other than the income pension from the old-age pension system. Occupational pensions, including premium pensions, have increased in recent years and account for a growing share of pension payments.<sup>29</sup> The premium pension system is still being built up and is not expected to be fully developed until 2060. According to the Swedish Pensions Agency's calculations, premium pensions are expected to amount to around 20 per cent of income pensions in 2040. For today's pensioners, premium pensions account for less than 5 per cent of income pensions. Taken together, income, premium and occupational pensions will increase as a share of GDP. The replacement rate will, on average, be largely unchanged when both occupational and premium pensions are included in the calculations<sup>30</sup> (see Diagram 13).

#### **FEWER SICK AND UNEMPLOYED SPELL LOWER TRANSFERS IN THE NEAR TERM**

Other social transfers are also projected to fall, from just over 7 per cent of GDP in 2015 to 6 per cent in 2040. The decrease is due chiefly to benefits relating to ill health and the labour market (see Diagram 14).

Social transfers relating to ill health<sup>31</sup> fell from almost 4 per cent of GDP in 2004 to close to 2 per cent of GDP in 2015. This is due partly to reduced sickness absence (fewer days of sickness benefits and fewer recipients of disability benefits) and a falling replacement rate. The projections for these transfers in the near term are based on the social insurance agency Försäkringskassan's forecast of continued reductions in ill health. Both sickness absence and the number of recipients of disability benefits are expected to fall through to 2021. After that, benefits relating to ill health are largely unchanged as a share of GDP.

<sup>29</sup> More than 90 per cent of the employed have an occupational pension. See Kjellberg (2017).

<sup>30</sup> The premium pension system and other occupational pensions are mainly recognised as part of the business sector in the national accounts and so do not entail any significant government expenditure.

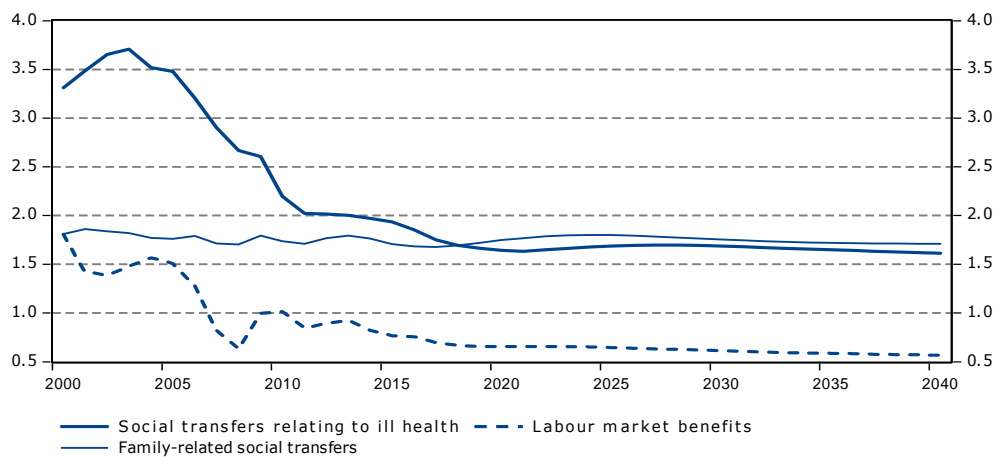
<sup>31</sup> Primarily sickness benefit and disability benefits (sickness and activity compensation).

Labour market benefits have also come down slightly since 2010. An increase in the introduction benefit for newly arrived immigrants, which has formed part of these benefits since 2011, has been offset by falling unemployment. Labour market benefits continue to fall as a share of GDP through to 2040. In the short term, this is due to dwindling unemployment. In the slightly longer term, it is due to a reduction in payments of introduction benefit as the number of newly arrived immigrants with residence permits drops back.

Family-related social transfers – primarily parental benefits and child benefit – have been relatively stable since 2000 at just under 2 per cent of GDP and are assumed to hold at that level.

**Diagram 14 Other social transfers**

Percentage of GDP



Sources: Statistics Sweden and NIER.

## 4.5 Government revenue with unchanged tax rules

### UNCHANGED TAX RULES GIVE A TAX-TO-GDP RATIO OF 44 PER CENT IN 2040

Taxes and duties amounted to around 43 per cent of GDP in 2016. From 2000 to 2014, the tax-to-GDP ratio fell by just over 6 percentage points, due mainly to the introduction of tax credits for the basic pension contribution and earned income (see Diagram 15). In 2015 and 2016, the ratio rose again due to tax increases for both households and firms in the form of reduced tax credits and allowances. Taxes on consumption, such as value-added tax and environmental taxes, have also risen.

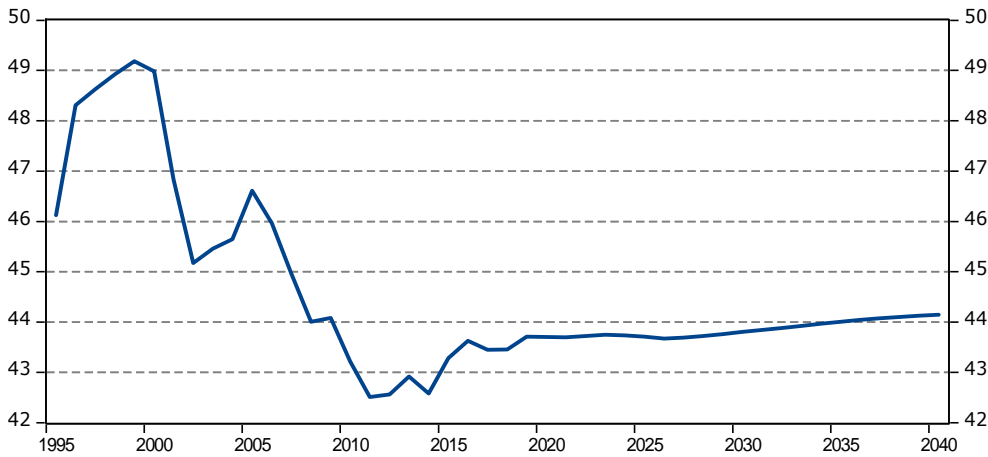
The projections of tax revenue are based on unchanged tax rules from those in force for 2017.<sup>32</sup> The tax-to-GDP ratio nevertheless climbs to just over 44 per cent in 2040. This is because household consumption, which is a key tax base, and taxable pensions,

<sup>32</sup> The projections do, however, take account of the Energy Agreement, which entails various gradual tax changes over the period 2017-2020.

which include premium and occupational pensions, grow more quickly than GDP (see Diagram 15).<sup>33</sup>

**Diagram 15 Tax-to-GDP ratio with unchanged taxes**

Taxes and duties as a percentage of GDP



Sources: Statistics Sweden and NIER.

## 4.6 Fiscal sustainability through to 2040

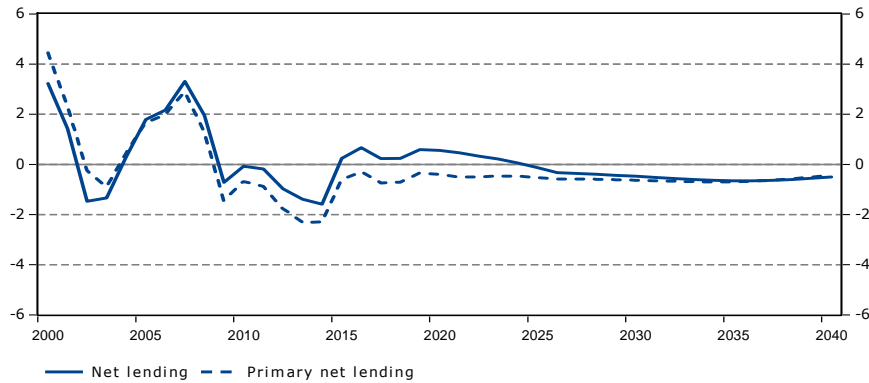
### **PERSISTENT PRIMARY DEFICITS WITH UNCHANGED TAX RULES**

Primary net lending – net lending excluding capital income and interest costs – is currently showing a deficit equivalent to around 0.5 per cent of GDP. The changes in primary revenue and expenditure presented above mean that this primary deficit will persist (see Diagram 16). With unchanged tax rules, tax revenue will not therefore be enough to fund the expenditure required to maintain personnel density in the provision of welfare services and the current level of income protection from social transfers.

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<sup>33</sup> The most important tax base, however, is wages. This is the tax base for municipal and central government income taxes, and also for employer and employee social security contributions. In the macroeconomic scenario, total wages are assumed to grow in line with GDP. This means that the tax-to-GDP ratio is not affected by changes in total wages.

**Diagram 16 Net lending and primary net lending with unchanged taxes**  
Percentage of GDP



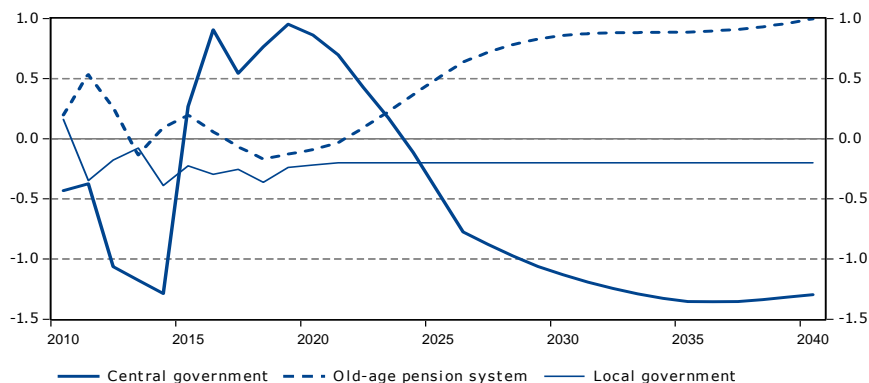
Sources: Statistics Sweden and NIER.

### NEGATIVE NET LENDING FROM 2025

Despite this negative primary net lending, overall net lending was positive in 2015 for the first time since the financial crisis erupted in 2008. Net lending will remain positive for the next few years due to capital income continuing to exceed interest costs. As interest rates normalise, however, net capital income will deteriorate as interest on government gross debt rises more than capital income (see the box “Low real interest rates mean weaker public finances”).<sup>34</sup> From 2025, net lending turns negative.

As can be seen from Diagram 17, it is in the central government sector that net lending deteriorates. The old-age pension system generates a growing surplus in the projections. This is because total contributions rise with total wages, which grow with GDP, while payments of income pensions fall as a share of GDP (see box above). The local government sector is assumed to be bound by the balanced-budget requirement, which is approximated with net lending of  $-0.2$  per cent of GDP in the projections.<sup>35</sup>

**Diagram 17 Net lending by subsector with unchanged taxes**  
Percentage of GDP



Sources: Statistics Sweden and NIER.

<sup>34</sup> The projections do not assume any sell-offs of central government financial assets.

<sup>35</sup> In these calculations, central government grants to municipalities are adjusted so that the balanced-budget requirement is met given developments in local government expenditure. For a more detailed explanation of these assumptions, see section 5.3 in NIER (2016a).

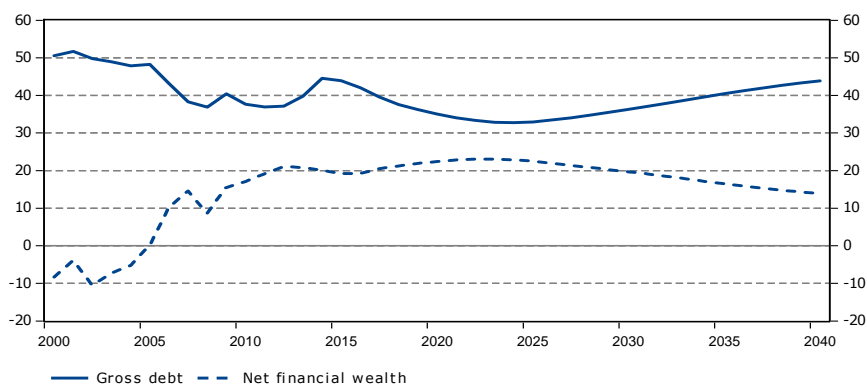
## DWINDLING NET WEALTH PRECLUDES SUSTAINABILITY

Net wealth rises for as long as net lending in the government sector as a whole is positive, which is until the mid-2020s (see Diagram 18). It then trends downwards. All in all, net wealth declines from almost 20 per cent of GDP today to 14 per cent in 2040. It was noted in Chapter 2 that an initial net wealth position in the government sector means that net wealth can stabilise even with persistently negative primary net lending. Given the interest rate-growth differential assumed in this report, net wealth would stabilise with a primary net lending deficit of around 0.1 per cent of GDP. The primary net lending deficit is somewhat larger, however, at around 0.6 per cent of GDP, which is why net wealth falls.

Based on the sustainability criteria discussed in Chapter 2,<sup>36</sup> public finances are not therefore sustainable in the period through to 2040 on which the analysis in this chapter focuses.

**Diagram 18 Government gross debt and net financial wealth**

Percentage of GDP



Sources: Statistics Sweden and NIER.

## GROSS DEBT FALLS IN THE NEAR TERM BEFORE RISING

Gross debt falls in the near term to a low of 33 per cent of GDP in 2024 (see Diagram 18). It then rises again once capital income is no longer sufficient to offset the primary net lending deficit. The deficit must then be funded with increased debt, with the result that gross debt rises to around 44 per cent of GDP in 2040.

## 4.7 Fiscal sustainability with adjusted taxes

For public finances to be sustainable, either taxes need to be raised or spending kept down. The calculations below are based on the assumption that taxes are adjusted so that revenue matches expenditure throughout the period so that net lending is zero every year from 2018. For simplicity, it is assumed that it is central government taxes that are adjusted.

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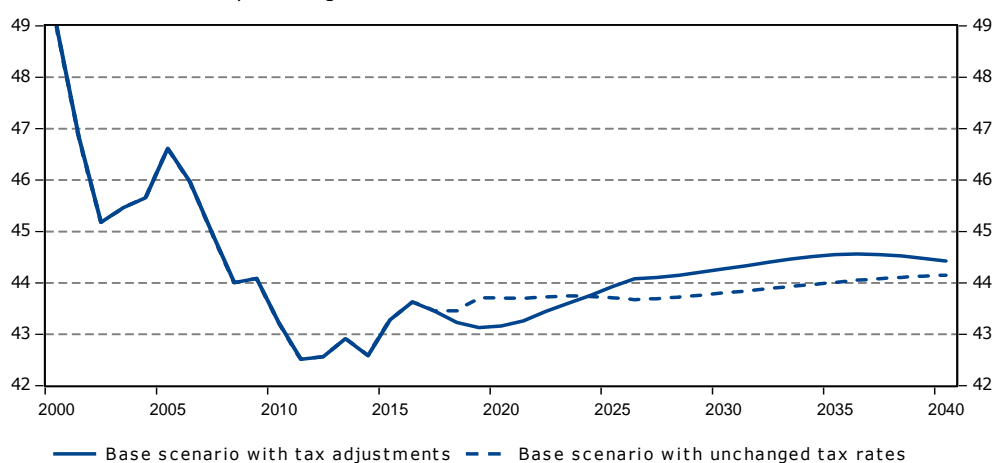
<sup>36</sup> According to the sustainability criteria discussed in Chapter 2, the minimum requirement was that net wealth stabilises as a share of GDP, and the stricter criterion was that net wealth stabilises at a certain level, which is set in this report at the current level of 20 per cent of GDP.

### GRADUAL RISE IN TAX-TO-GDP RATIO FROM 2020

To begin with, taxes can be lowered, because net lending is currently positive. After 2019, however, the tax-to-GDP ratio needs to rise. By 2040, it is slightly more than 44 per cent, which is just above the level with unchanged tax rules and approximately what it was in 2008 (see Diagram 19). Most of the tax increases take place between 2020 and 2025, because it is then that the expenditure-to-GDP ratio increases the most.

**Diagram 19 Tax-to-GDP ratio with constantly balanced net lending**

Taxes and duties as a percentage of GDP



Note: The diagram is based on projections where taxes are adjusted so that net lending is zero every year from 2018.

Sources: Statistics Sweden and NIER.

### BALANCED NET LENDING RESULTS IN SUSTAINABILITY

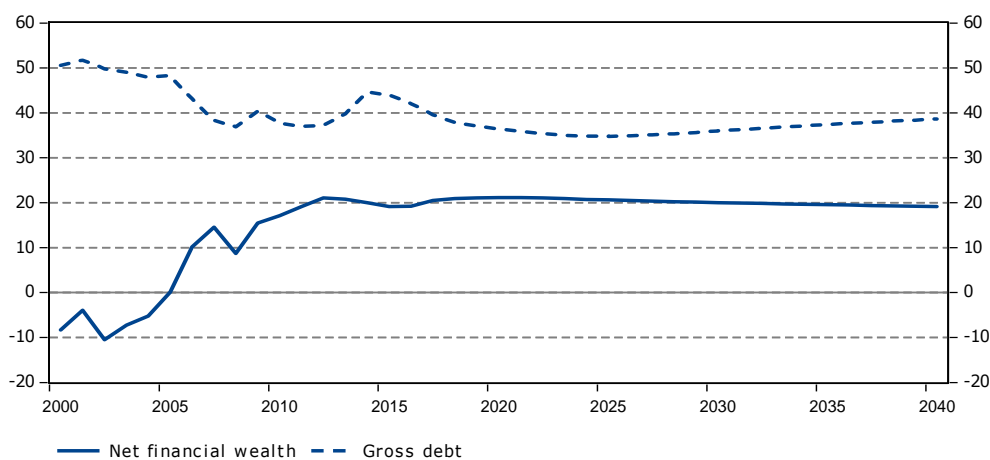
As would be expected, net financial wealth stabilises as a share of GDP when taxes are adjusted so that general government net lending is zero each year (see Diagram 20). As noted in Chapter 2, balanced net lending in the base scenario in this report is, in principle, a sufficient criterion for net wealth to stabilise as a share of GDP. This is because the interest rate-growth differential in the estimates is negligible.

Tax hikes corresponding to an average increase in the tax-to-GDP ratio of 0.4 percentage points will be needed through to 2040 for net wealth to be stable at the current level of 20 per cent of GDP. This means that the base scenario with adjusted taxes satisfies the sustainability criteria in this report.



**Diagram 20 Net wealth and gross debt in the base scenario with adjusted taxes**

Percentage of GDP



Sources: Statistics Sweden and NIER.

### **BUT GROSS DEBT CLIMBS SLIGHTLY AFTER 2025**

Even when taxes are adjusted so that public finances are balanced each year, gross debt does not trend downwards as a share of GDP. In the absence of budget deficits, one might expect GDP growth to lead gradually to a lower debt-to-GDP ratio. There is indeed a decrease through to 2025, but gross debt then increases again as a share of GDP.

The reason why the ratio of gross debt to GDP does not continue to decline has to do with the distribution of net lending between subsectors. When taxes are raised to ensure zero net lending in the general government sector each year, net lending in the central government sector is boosted. However, the surplus in the old-age pension system means that the central government sector is still permitted to run a deficit in the projections. These deficits are funded through borrowing, because no sell-offs of state-owned financial assets are assumed in the projections, which means that gross debt gradually rises.

#### **Public finances sustainable if the new surplus target is met continuously**

The following presents calculations of gross debt and net wealth under the assumption that general government net lending is one-third of a percent of GDP every year from 2019. In these calculations, taxes are adjusted so that government revenue each year exceeds the expenditure projected in the base scenario by one-third of a percent of GDP.

#### **The new framework in brief**

The Surplus Target Committee recommends that the surplus target for general government net lending is lowered from today's 1 per cent of GDP over a business cycle to one-third of a percent of GDP over a business cycle. It also proposes that the framework is supplemented with a debt anchor. This anchor is to serve as a guide rather than an operational target like the surplus target. Based on the committee's proposals, general government consolidated gross debt (Maastricht debt) should be held around 35 per cent of GDP. Should it stray more than 5 per cent of GDP from this anchor, the government would be required to submit an explanation to parliament. This last requirement is part of the im-

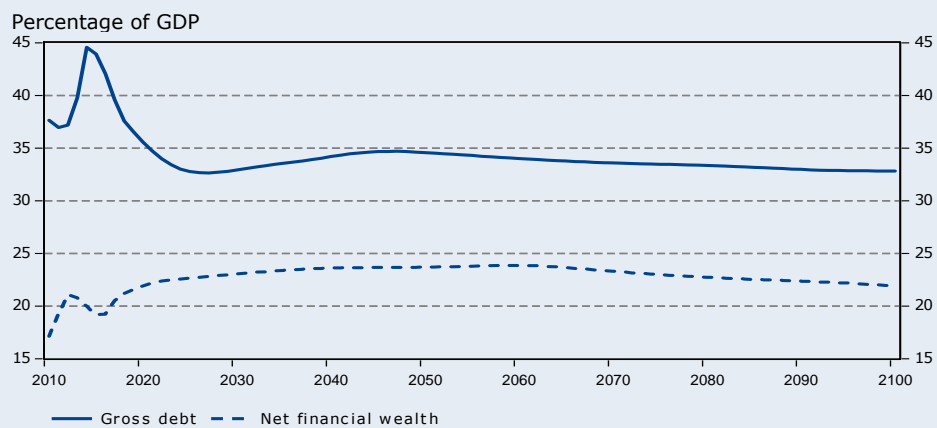
provements to the follow-up of the surplus target that are also proposed by the committee.

### Gross debt close to the debt anchor

In the analysis above, general government net lending is more than one-third of a percent of GDP in 2019–2022, but then falls and turns negative from 2025. To meet the proposed new level of the surplus target, either taxes need to be raised or spending kept down. If taxes are adjusted to keep net lending at one-third of a percent of GDP every year from 2019, they need to be lowered initially before being raised again.

If the surplus target is met every year, the ratio of gross debt to GDP falls through to the second half of the 2020s, to a low of just under 33 per cent (see Diagram 21). It then climbs again through to the late 2040s, to around 35 per cent. Gross debt thus remains well within the interval of 30–40 per cent of GDP.

**Diagram 21 Gross debt and net wealth with net lending at one-third of a percent of GDP every year**



Sources: Statistics Sweden and NIER.

Gross debt does not come down to the level of the debt anchor and hold within the margin of  $\pm 5$  percentage points in these estimates by chance. The Surplus Target Committee's proposed level for the debt anchor was chosen so that gross debt reaches this level given various assumptions about government expenditure and the assumption that the surplus target is met.

Although net lending is positive, gross debt does not therefore decrease notably as a share of GDP. Exactly as in the base scenario with adjusted taxes, it is central government net lending that is adjusted so that general government net lending is, in this case, one-third of a percent of GDP every year. Positive net lending in the old-age pension system means, however, that central government net lending is again negative in these calculations. Central government will therefore need to borrow more, so its gross debt will increase. Net wealth, however, again stabilises around the current level of just over 20 per cent of GDP in these calculations.

## 5 Sustainability improved from last year's report

In last year's sustainability report, the government sector showed a deficit of just over 1 per cent of GDP in 2015, rising gradually to around 3 per cent of GDP in 2040. Over the same period, net wealth fell to -16 per cent of GDP, and gross debt climbed to 87 per cent of GDP. As shown in Chapter 4, the outlook for public finances is considerably more favourable in this year's report. This chapter looks at the reasons for this improvement and finds that it is largely attributable to developments in the near term.

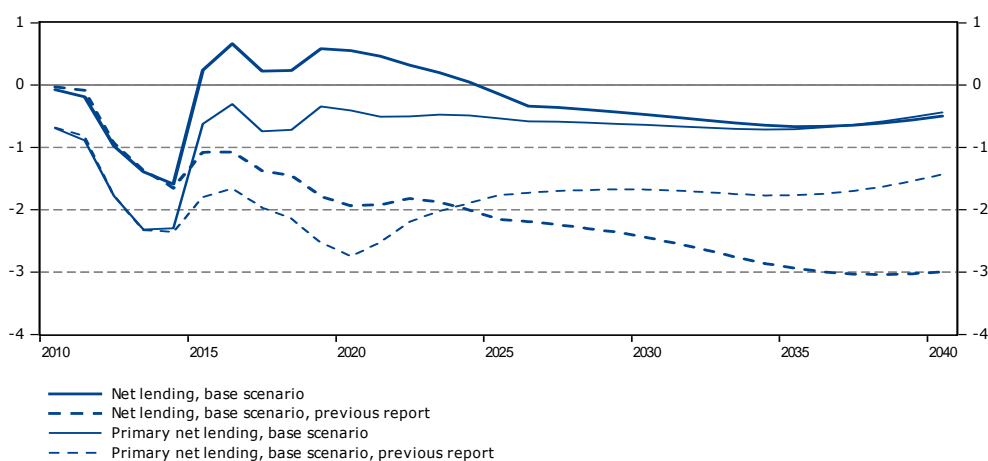
### 5.1 Higher net lending through to 2021

The first five years of the projections are based on the economic forecast published by the NIER in December each year. Developments during these first five years are important, because an accumulated deficit during this period will need to be financed in the future.

The accumulated primary net lending deficit during the first five years is substantially smaller in this year's report (see Diagram 22). Last year's report had a primary net lending deficit of 1.8 per cent of GDP in 2015, while this year's has it at 0.6 per cent. Overall net lending was around -1.1 per cent of GDP in 2015 in last year's report, but is now positive at 0.2 per cent. This surplus also persists for a number of years, because there is sufficient net capital income to cover the primary net lending deficits through to 2025. In last year's report, the deficit needed to be financed with increased borrowing in all years. This had major implications for gross debt in the projections and so also for long-term sustainability.

**Diagram 22 Net lending and primary net lending**

Percentage of GDP



Sources: Statistics Sweden and NIER.

### **BOTH HIGHER TAX REVENUE AND LOWER EXPENDITURE THROUGH TO 2021**

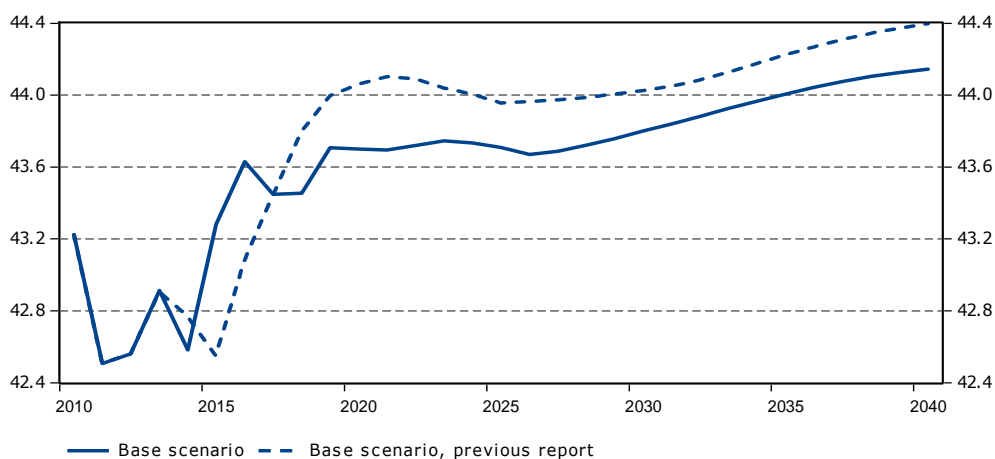
The improved net lending in the first five years of the projections (through to 2021 in this year's report) is a result of both higher taxes and lower spending. Revenue is higher until 2017, while expenditure is mainly lower after 2017.

Tax revenue is higher in 2015 and 2016 than forecast last year. All in all, the ratio of taxes and duties to GDP has been revised up by almost 1 percentage point per year in 2015 and 2016 (see Diagram 23). This is due mainly to direct household taxation, comprising local and central government income taxes and capital taxes, having been revised up as a share of GDP. Household capital income has performed better than expected given the economic climate, due largely to high turnover and rapid price inflation in the housing market. Stock market developments at the beginning of 2015 also resulted in high capital gains for households. This meant that central government revenue from capital taxes was higher than expected. Household capital income is expected to remain high in 2016. Value-added tax revenue has also been revised up for 2016, and receipts of corporate taxes were high given the economic climate in both 2015 and 2016.

Revenue from capital taxes, value-added tax and corporate taxes will gradually return to more normal levels relative to GDP. The tax-to-GDP ratio has nevertheless been revised down from 2017 in this year's report, due to structural changes in the composition of the tax bases, and this affects developments right through to 2040 (see section 5.2).

**Diagram 23 Tax-to-GDP ratio**

Taxes and duties as a percentage of GDP



Sources: Statistics Sweden and NIER.

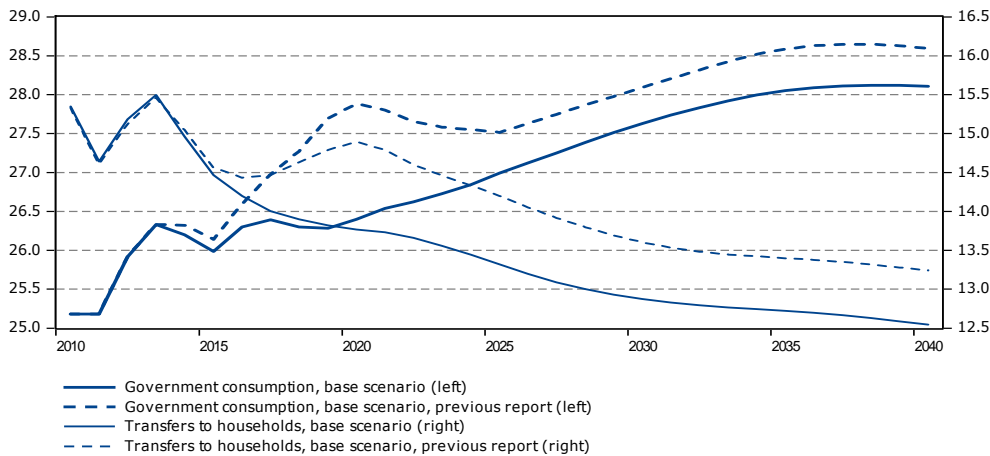
### **GOVERNMENT CONSUMPTION LOWER, DUE MAINLY TO FEWER ASYLUM SEEKERS**

Primary expenditure is significantly lower than in last year's report (see Diagram 24). This is due chiefly to lower spending on refugee reception and mainly affects expenditure after 2017. The forecast on which last year's report was based suggested that the rapid influx of asylum seekers, and in particular the high number of unaccompanied

children, would continue in the coming years.<sup>37</sup> In 2016, however, a number of political decisions were taken which, together with developments elsewhere in Europe, have resulted in a substantial reduction in the number of new asylum seekers. This means that the forecast in this year's report is based on a very different situation to last year.

**Diagram 24 Government consumption and transfers to households**

Percentage of GDP



Sources: Statistics Sweden and NIER.

Compared to last year's report, the Swedish Migration Agency has revised down the number of new asylum seekers in 2015–2019 by more than 360,000, including more than 80,000 fewer unaccompanied children. The average number of people registered in the reception system has also been revised down by an average of 145,000 per year in 2015–2019, with the largest downward revision in 2017.<sup>38</sup> These refugees are not counted as part of the population but still result in expenditure for the public sector on accommodation and costs during the asylum process.

The smaller number of new asylum seekers, and especially unaccompanied children, than in last year's report has resulted in a substantial downward revision of spending on refugee reception. All in all, spending on refugee reception in 2015–2019 has been revised down by almost SEK 100 billion, mostly in the last two years of the period. This is the single most important reason why government consumption is substantially lower in this year's report. The reduction in unaccompanied children is highly significant, because costs for their accommodation and care are much higher than for adult asylum seekers.

The reason why spending on refugee reception peaked in 2020 in last year's forecast was that the NIER was using the Migration Agency's forecast and so assumed that this spending would normalise through to 2025. This year's report also assumes that

<sup>37</sup> The NIER's December 2015 forecast was based on the Migration Agency's October 2015 forecast for spending on refugee reception and Statistics Sweden's November 2015 population forecast. This population forecast was based, in turn, on the Migration Agency's forecast for the number of asylum seekers and the percentage of these asylum seekers who would be granted residence permits.

<sup>38</sup> These revisions refer to the difference between the Migration Agency's forecasts in October 2015 and October 2016, as these formed the basis for the NIER's economic forecasts in December 2015 and December 2016 respectively.

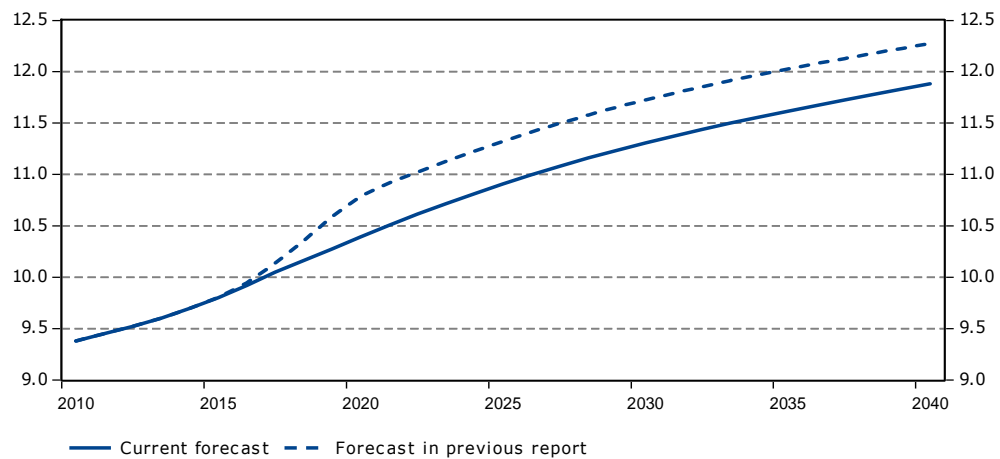
spending on refugee reception will return to historically normal levels, but this normalisation is now expected to occur more quickly given that the level of spending is now so much lower.

### **SMALLER POPULATION FURTHER REDUCES CONSUMPTION**

Asylum seekers are not counted as part of the population until they have been granted residence permits. The smaller number of asylum seekers than in last year's report means, above all, fewer children and fewer people of working age in the future population. The revision of individual age groups results in a different population structure to that in last year's report. The largest revision of the population is in 2018–2021. Government consumption has been revised down during this period as a result of a reduced need for schools and education. It was mainly during this period that the population was expected to grow rapidly in last year's report (see Diagram 25).

**Diagram 25 Population forecasts**

Million inhabitants



Sources: Statistics Sweden.

### **LOWER TRANSFERS DUE TO FEWER SICK AND UNEMPLOYED**

Expenditure on transfers is also expected to be much lower over the next few years in this year's report (see Diagram 24). This is mainly because the number of people who are on sick leave, and so receiving sickness or disability benefits, and the number of people who are unemployed, and so receiving unemployment benefits, are now expected to be lower.

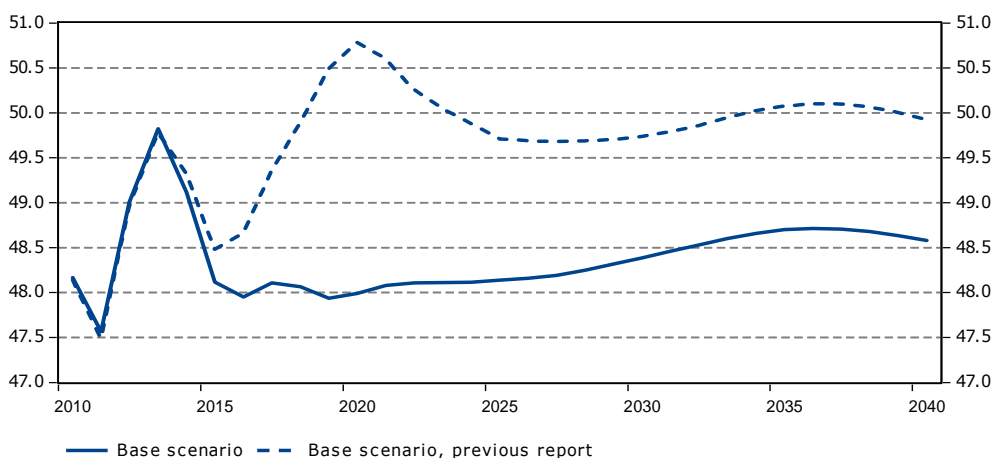
Fewer asylum seekers in this year's report also result in lower expenditure on transfers to households, but not until they receive residence permits and meet the criteria for the various benefit systems.<sup>39</sup>

Taken together, these revisions of government spending mean that primary expenditure is slightly more than 2.5 percentage points lower as a share of GDP than in last year's report (see Diagram 26).

<sup>39</sup> Mainly the introduction benefit paid for two years after being granted a residence permit, and payments to families such as parental, child and housing benefits.

**Diagram 26 Primary expenditure**

Percentage of GDP



Sources: Statistics Sweden and NIER.

## 5.2 Lower expenditure means higher net lending through to 2040

Government expenditure on consumption and transfers as a share of GDP is lower than in last year's report right through to 2040, although the revisions are greatest during the first few years.

Transfers are lower mainly because the lower levels of spending on unemployment and ill health are expected to persist. All in all, expenditure on these two systems has been revised down by the equivalent of 0.4 per cent of GDP in 2040. The downward revision of consumption is due partly to the revised population forecast resulting in a more favourable age structure also in the longer term.

The tax-to-GDP ratio is lower in the long run than in last year's report. This is due to the revision of the economic forecast resulting in a less favourable composition of production in tax terms. Above all, the wage share is lower throughout the period until 2040. Because wages are the most important tax base, this results in lower overall tax revenue as a share of GDP (see Diagram 23).

Tax revenue has been revised down much less far than expenditure, however, which means that primary net lending is higher than in last year's report in the long term as well. In 2040, primary net lending is around 1 percentage point higher than in last year's report.

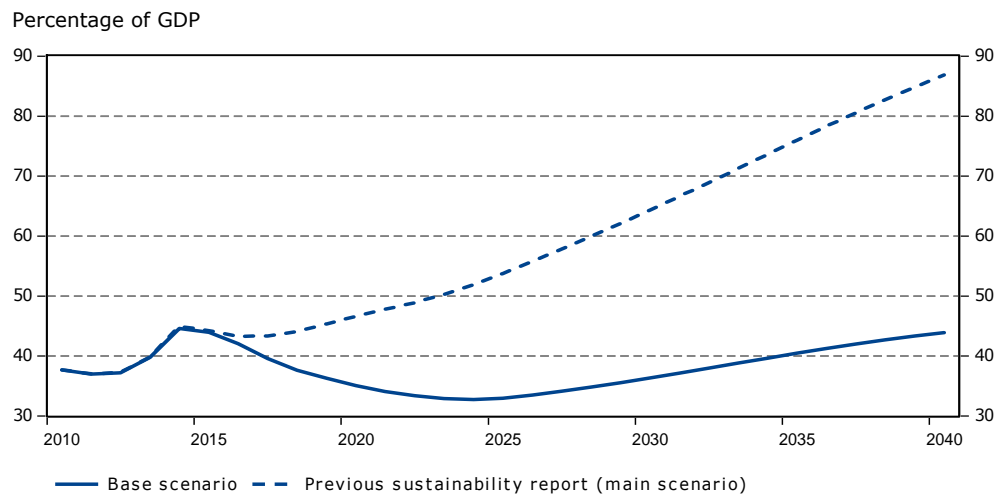
## 5.3 Higher primary net lending means better long-term sustainability

The review above shows that the revisions of primary net lending are greatest in the near term. In the longer run, the revisions are smaller.

The more favourable path for primary net lending in this year's report means that gross debt decreases to a low of 33 per cent of GDP in 2024. This is because there is sufficient net capital income in this year's report to cover the primary net lending deficits up until then. After 2024, gross debt rises, reaching 44 per cent of GDP in 2040. In last year's report, the primary net lending deficit was much larger, resulting in increased gross debt in all years. In 2040, gross debt was instead 87 per cent of GDP (see Diagram 27).

Movements in gross debt impact in turn on the public sector's capital costs.<sup>40</sup> The revision of overall net lending is therefore much greater than the revision of primary net lending. Net lending as a share of GDP has been revised by 1.7 percentage points in 2016 and 2.5 percentage points in 2040.

**Diagram 27 General government gross debt**



Sources: Statistics Sweden and NIER.

The better primary net lending in this year's report means that gross debt will decrease rather than increase over the next few years, and will increase much more slowly in the longer run. Similarly, net wealth moves much more positively in this year's report. As discussed in Chapter 4, net wealth still fails to stabilise by 2040 in this year's report, but the outlook is not nearly as worrying as last year. Although public finances cannot be considered sustainable through to 2040, the outlook presented in this year's report is much closer to sustainability.

<sup>40</sup> The assumptions for interest rates are the same as in last year's report. The effect on capital costs is therefore a result of different movements in the stock of debt.



## 6 Alternative scenarios

This chapter presents developments in public finances in two alternative scenarios for the economy. The first, referred to as *unchanged behaviour*, differs from the base scenario by assuming a constant retirement age. The need for welfare services in each age group is also assumed to be the same as today. In this scenario, therefore, the population is assumed to live as long as in the base scenario, but to be less healthy at any given age. The second alternative scenario, *reduced personnel density*, assumes that personnel density in the provision of welfare services decreases by 0.3 per cent per year. Otherwise it is based on the same assumptions as the base scenario. The two alternative scenarios impact mainly on government consumption, because they both have implications for personnel density in the provision of welfare services.

### 6.1 Unchanged behaviour

A constant retirement age results in lower participation and employment rates than in the base scenario (see Diagram 4). A shorter working life also means that GDP is slightly lower than in the base scenario. As the tax bases grow with GDP, the effect of lower employment on the tax-to-GDP ratio is minor.

Government consumption is almost 1 percentage point higher as a share of GDP in 2040 than in the base scenario (see Diagram 28). This is explained mainly by higher costs for health and elderly care as a result of increased ill health among the elderly, but also by output being lower in this scenario.

The difference between this scenario and the base scenario gives an idea of the effects on public finances of better health among the elderly and a longer working life. In the base scenario, the population exits the labour force an average of 1.5 years later in 2040 than today, and better health among the elderly delays the need for age-typical welfare services by 1.5 years. By 2100, this “rejuvenation” of behaviour increases to five years in the base scenario. The difference in government consumption between the alternative scenario and the base scenario is then almost 5 per cent of GDP. Somewhat simplified, we can say that each year of rejuvenation of behaviour in terms of the need for welfare services and exit from the labour force reduces government consumption by 1 per cent of GDP.

### 6.2 Reduced personnel density

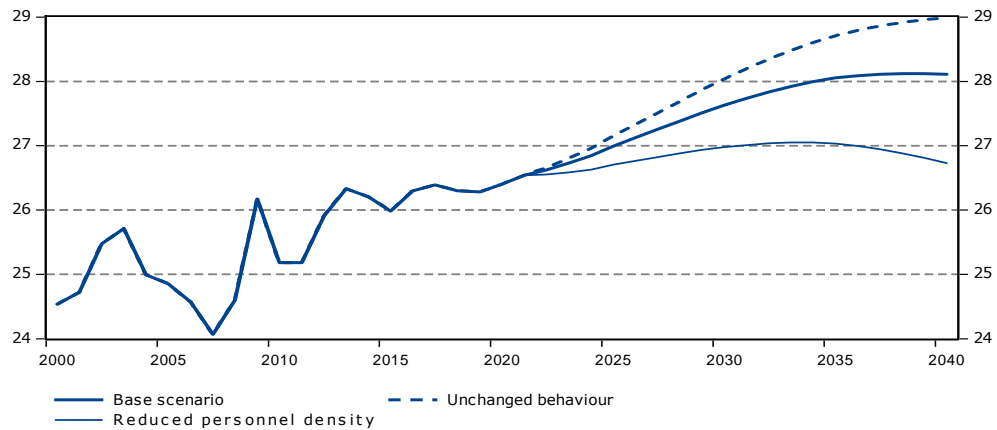
In this scenario, users of welfare services no longer benefit from the whole of the increase in standards that occurs in the base scenario with unchanged personnel density. The increase in standards is now limited to 0.3 per cent per year, or half that in the base scenario (see section 3.4). No indirect effects of reduced personnel density on the rest of the economy are taken into account, with the result that government revenue is largely unchanged through to 2040.

The change in personnel density means that the ratio of government consumption to GDP increases only by 0.5 percentage points by 2040 and is therefore around 1.4 percentage points lower in 2040 than in the base scenario (see Diagram 28). This is

explained exclusively by decreases in the volume of welfare services, as GDP is unchanged from the base scenario. These decreases in volume reduce the need for investment in the local government sector, which is therefore also somewhat lower than in the base scenario.

**Diagram 28 Government consumption**

Percentage of GDP



Sources: Statistics Sweden and NIER.

### 6.3 Sustainability in the alternative scenarios

In the base scenario, net lending deteriorates as interest costs gradually rise and gross debt grows. In the alternative scenario with unchanged behaviour, these effects are amplified, due mainly to higher government consumption. Precisely as in the base scenario, net lending turns from positive to negative around 2025, and it amounts to  $-2$  per cent of GDP in 2040 (see Table 4). Gross debt therefore rises gradually from 2025 to just over 50 per cent of GDP in 2040. Net wealth falls more quickly than in the base scenario and is close to zero in 2040. The criteria for sustainability are not therefore met in this scenario through to 2040 (see section 2.3).

In the scenario with reduced personnel density, net lending is never negative and primary expenditure declines as a share of GDP. Gross debt is therefore below 30 per cent of GDP in 2040, and net lending is then almost 2 per cent of GDP. The slower increase in government welfare spending means that net wealth is almost unchanged at current levels through to 2030 before rising slightly. This means that there is scope to reduce taxes or increase expenditure in this scenario.

Table 4 shows how the tax-to-GDP ratio would need to be adjusted for net lending to be zero from 2018 onwards in the three scenarios. In the scenario with unchanged behaviour, the ratio would need to be raised gradually to 45.4 per cent in 2040, which is 1 percentage point higher than in the base scenario. In other words, the gain from the 1.5-year rejuvenation of behaviour in terms of welfare services and retirement age consists of a 1 percentage point lower tax-to-GDP ratio in 2040. The alternative scenario with reduced personnel density instead permits a gradual lowering of taxes after 2026 to 43.0 per cent of GDP in 2040.

**Table 4 Public finances in 2040**

Percentage of GDP

	Base scenario	Unchanged behaviour	Reduced personnel density	2017
Primary revenue	48.1	48.2	48.2	47.4
Primary expenditure	48.6	49.7	47.1	48.1
Net lending	-0.5	-2.1	1.7	0.2
Net financial wealth	13.9	0.8	29.8	20.5
Gross debt	43.9	54.2	27.4	39.6
Tax-to-GDP ratio required for neutral net lending	44.4	45.4	43.0	43.4

Source: NIER.

### Scenario with no increase in standards in government consumption

The following outlines an additional scenario for public finances where government consumption increases only with the demographic need – in other words, there is no increase in standards. The aim of this scenario is partly to aid comparison with the government’s estimates of fiscal sustainability.

Like the NIER, the government assumes an unchanged public sector commitment to welfare, but the government defines this commitment differently in terms of government consumption.<sup>41</sup> However, the NIER and the government use the same definition of an unchanged welfare commitment when it comes to transfers (an unchanged replacement rate).

To understand the implications of the scenario without an increase in the standard of welfare services, and the differences in the government’s calculations, we begin by looking at how the government and the NIER define the concept of an unchanged public sector commitment when it comes to welfare services. We then describe briefly what this scenario means for long-term fiscal sustainability given the same assumptions for the economy in other respects as in the base scenario. As in the base scenario, it is assumed that the elderly become ever healthier so that their need for health and care services decreases with time.

### Unchanged welfare commitment as defined by the government and the NIER

In the government’s estimates, an unchanged public sector commitment to welfare is defined as the standard per user being unchanged in terms of the input of resources. This can be expressed as tomorrow’s 90-year-old receiving the same number of hours of elderly care as a 90-year-old today, and staff having access to the same amount of capital goods and other inputs as today. Because prices for capital goods and other inputs normally rise more slowly than wages, the share of total costs for which capital goods and other inputs account will decrease over time.<sup>42</sup>

The government’s definition of an unchanged welfare commitment does not therefore include any increase in the standard of welfare services. The govern-

<sup>41</sup> See the section “Bedömning av finanspolitikens långsiktiga hållbarhet” [Assessment of the long-term sustainability of fiscal policy] in Swedish Government (2016).

<sup>42</sup> The same level of consumption expenditure could be achieved by using more capital goods and other inputs in production while keeping down wage costs with personnel cuts to keep the shares of total costs constant. A simulation of this kind underlies the alternative scenario in this special analysis.

ment justifies this assumption by arguing that “if people in future want a higher standard of tax-funded welfare services [...] this is not something that should be cause for higher general government net lending today. Future generations will have to weigh the benefits of a higher standard of welfare services against the benefits of more leisure time [...] and strike a reasonable balance between work and taxes on the one hand and leisure and the level of general government services on the other.”

The NIER defines an unchanged public sector commitment to welfare as unchanged personnel density plus a slight increase in standards per user. The share of total costs for which wages and capital goods and other inputs account are assumed to be constant over time. This ties in well with historical developments. Since prices for capital goods and other inputs normally rise more slowly than wages, this means that the volume of capital goods and other inputs per hour worked will increase over time (see section 3.4). This can be expressed as tomorrow’s 90-year-old receiving the same number of hours of elderly care as a 90-year-old today, but also benefiting from more and/or better capital goods and other inputs. An unchanged public sector commitment therefore permits a gradual increase in the standard of welfare services.<sup>43</sup>

#### **Unchanged standards in government consumption push up net wealth**

The biggest difference between the base scenario and the scenario with no increase in the standard of welfare services is that government consumption expenditure falls slightly from 26 per cent of GDP in 2026 to 25 per cent in 2040.<sup>44</sup> This contrasts with an increase to 28 per cent in 2040 in the base scenario. In other words, this scenario departs one step further from the base scenario than the alternative scenario with reduced personnel density.

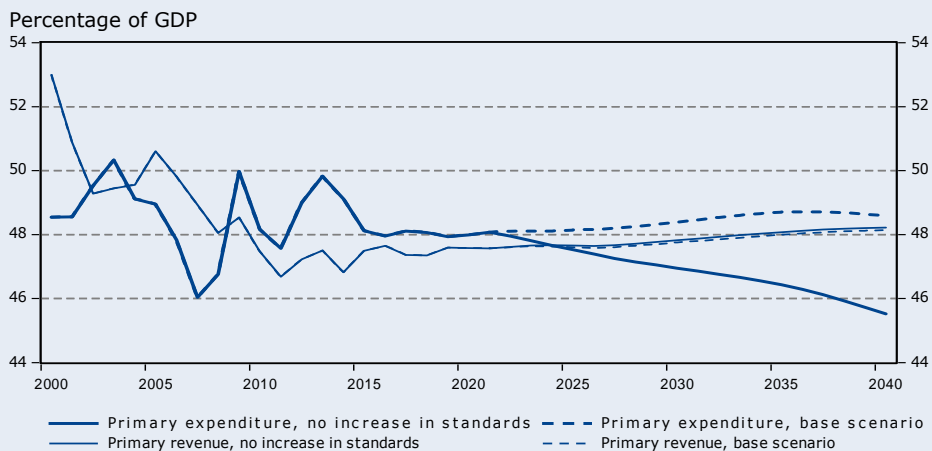
Diagram 29 shows primary revenue and expenditure in this scenario and the base scenario. As can be seen, primary revenue is more or less the same. The differences are in primary expenditure and are found entirely in government consumption.

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<sup>43</sup> The assumption of a “rejuvenation” of behaviour in the base scenario in this report also means that a 95-year-old receives the same number of hours of elderly care in 2100 as a 90-year-old does today.

<sup>44</sup> The number of hours worked in the economy is not lower in this scenario than in the base scenario, because those not now working in the public sector are assumed to work in the private sector instead.

**Diagram 29 Primary revenue and expenditure**

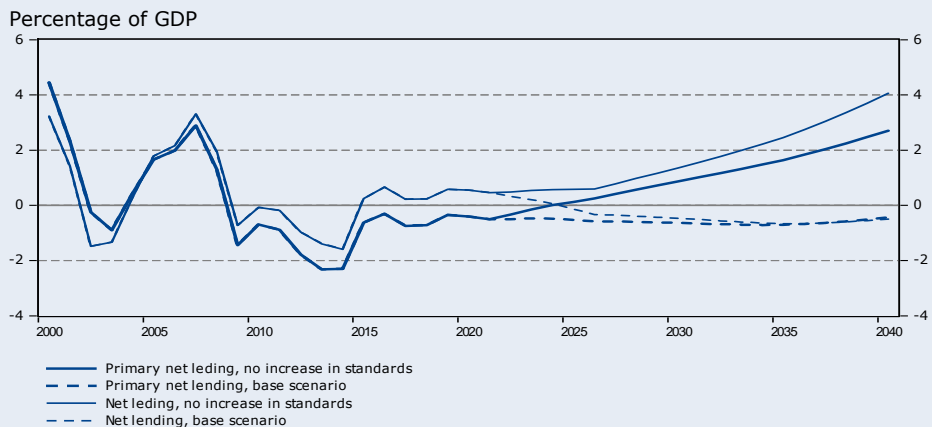


Sources: Statistics Sweden and NIER.

Net lending strengthens and is slightly more than 4 per cent of GDP in 2040 (see Diagram 30). Net wealth stabilises initially at current levels of 20 per cent of GDP, but increases after 2030 to 47 per cent of GDP in 2040. Gross debt falls to just 10 per cent of GDP in 2040 (see Diagram 31).

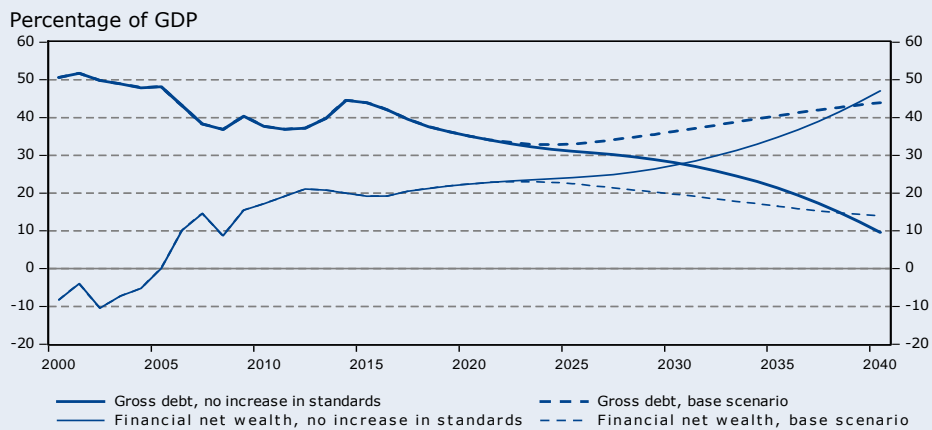
This scenario therefore satisfies the sustainability criterion that net wealth should not decrease as a share of GDP. Quite the opposite, it increases as a share of GDP.

**Diagram 30 Net lending and primary net lending**



Sources: Statistics Sweden and NIER.

**Diagram 31 Gross debt and net wealth**



Sources: Statistics Sweden and NIER.

## 7 Public finances until 2100

This chapter analyses fiscal sustainability in the very long term. It looks at both the report's base scenario and the two alternative scenarios. Theoretically, it is possible to analyse the sustainability of public finances over an infinite time horizon. In practice, however, a simplifying assumption is made that public finances are “frozen” after a given final year. After that year, primary net lending is assumed to be constant as a share of GDP at the level of the final year. In the following analysis, 2100 has been set as the final year. This allows full use of the information in Statistics Sweden's population forecast.

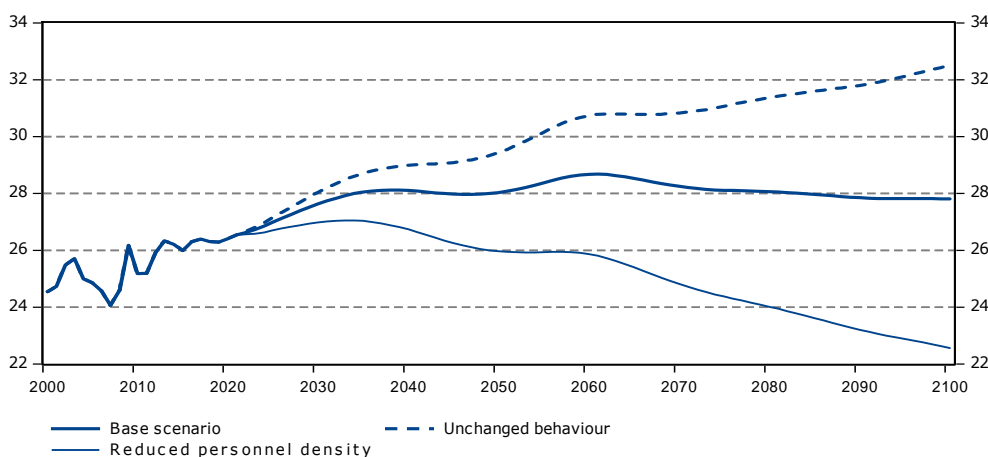
### 7.1 Primary revenue and expenditure in the three scenarios

#### BETTER HEALTH HAS A GROWING IMPACT OVER TIME

Beyond 2040, government consumption largely stops rising as a share of GDP in the base scenario. In 2100, it amounts to just under 28 per cent of GDP (see Diagram 32). In the alternative scenario with unchanged behaviour, government consumption instead continues to increase throughout the period to almost 33 per cent of GDP in 2100.

**Diagram 32 Government consumption**

Percentage of GDP



Sources: Statistics Sweden and NIER.

Movements in government consumption in the alternative scenario with unchanged behaviour are closely related to the demographic dependency ratio (see Diagram 2). In periods when this ratio rises, government consumption as a share of GDP will also rise, whereas it will fall when the dependency ratio falls. This relationship between the dependency ratio and government consumption can also be seen in the base scenario, but weakens over time. Despite the increase in the dependency ratio from 2080 onwards, there is no increase in government consumption as a share of GDP in the base scenario. This is due to the assumption of a rejuvenation of behaviour having a growing impact over time. By 2100, the rejuvenation of the need for welfare services means

that an 80-year-old is expected only to need the same welfare services as today's 75-year-old. This reduces the rate of growth in government consumption. The rejuvenation of labour market behaviour in the base scenario also means that the retirement age is four years higher than today. This boosts GDP, further curbing the increase in the consumption-to-GDP ratio.

In the alternative scenario with reduced personnel density, where productivity improvements result partly in savings on personnel and inputs, government consumption continues to decline after 2040 to just 23 per cent of GDP in 2100. With a 0.3 per cent decrease in personnel density per year, personnel density is 25 per cent lower in 2100 than it is today. The plausibility of such a scenario is difficult to gauge as it is so far into the future. Technological advances will probably make it possible for routine tasks in health care, education and general public services to be taken over to some extent by computers, robots and other aids in the future. However, the services provided by the public sector are relatively personnel-intensive, as much of the value added is embedded in the actual interaction between service provider and user.

#### **PRIMARY NET LENDING NEUTRAL IN 2100 IN THE BASE SCENARIO**

The developments in government consumption in the base scenario mean that overall primary expenditure peaks around 2060 before falling back to just over 48 per cent of GDP in 2100. Primary expenditure other than consumption is largely constant as a share of GDP in the projections beyond 2040.<sup>45</sup> The expenditure-to-GDP ratio in 2100 is instead 54 per cent in the alternative scenario with unchanged behaviour, and only 43 per cent in the alternative scenario with reduced personnel density.

In the base scenario, primary net lending gradually improves from 2060 through to 2100, by which time it is marginally positive (see Diagram 33). The long period of deficits means, however, that government debt continues to grow, resulting in rising interest costs and even larger deficits once interest costs are taken into account. In other words, the debt dynamics through to 2040 continues. In 2100, gross debt amounts to 64 per cent of GDP, while net wealth, which turns negative in the mid-2060s in the base scenario, is -9 per cent of GDP.

In both alternative scenarios, primary net lending follows a similar pattern after 2040 to that before 2040. Primary net lending deteriorates gradually with unchanged behaviour and improves gradually with reduced personnel density. Figures for net wealth, gross debt and other key variables can be found in the appendix.

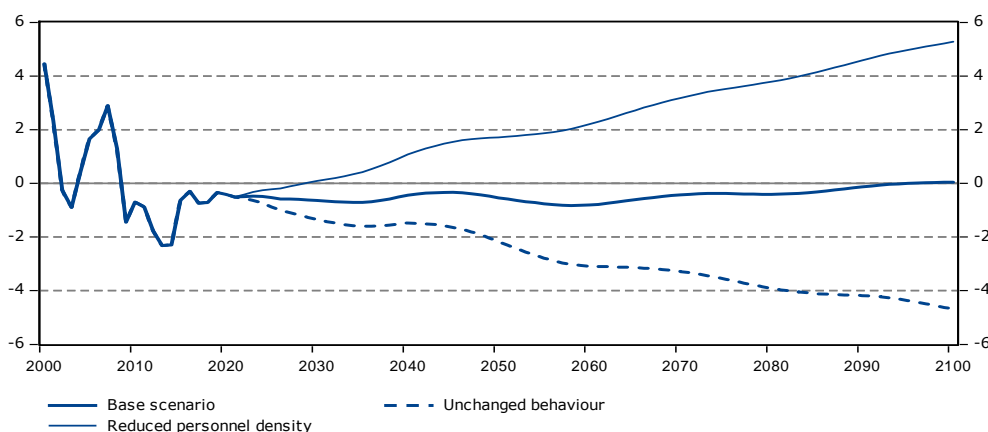
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<sup>45</sup> As in last year's report, the old-age pension system is overfunded in 2040, which means that it accumulates a great deal of capital. To avoid such an unrealistic situation, an "accelerator" has been introduced into the system. This ensures that the pension system's net wealth is held constant as a share of GDP after 2040. For a more detailed description of this, see the section "Old-age pension system overfunded in the long term" in NIER (2016a).



**Diagram 33 Primary net lending with unchanged taxes**

Percentage of GDP



Sources: Statistics Sweden and NIER.

### **SAME TAX-TO-GDP RATIO IN 2100 AS IN 2040**

Chapter 4 found that the tax-to-GDP ratio in the base scenario would need to be raised by an average of 0.4 percentage points through to 2040, to just over 44 per cent of GDP, to fund an unchanged welfare commitment and still keep the budget balanced. This picture does not change appreciably when the projection horizon is extended to 2100. This effectively means that, if the budget is balanced in 2040, unchanged taxes will be sufficient to fund an unchanged welfare commitment after that.

In the alternative scenario with unchanged behaviour, taxes need to be raised further after 2040 to fund the continued increase in expenditure. In 2100, the tax-to-GDP ratio is 50 per cent. If, on the other hand, the reduction in personnel density in the other alternative scenario continues through to 2100, the tax-to-GDP ratio can gradually be lowered to 39 per cent.

## 7.2 Sustainability through to 2100

This section looks at two indicators for evaluating long-term fiscal sustainability: the S2 indicator and an indicator we call S2+. The S2 indicator is used by both the Swedish government and the European Commission. S2+ is a variant of the S2 indicator developed by the NIER to take some account of dynamic effects.<sup>46</sup>

### **THE S2 INDICATOR**

The S2 indicator shows the amount of immediate and permanent tightening of public finances (spending cuts or tax increases) needed to achieve long-term sustainability.<sup>47</sup> Long-term sustainability means here that the intertemporal budget constraint is satisfied. The intertemporal budget constraint means that the sum of discounted future

<sup>46</sup> The calculation of S2+ takes account of household financial wealth being assumed to be lower in the event of tax increases. This leads to lower tax revenue from the taxation of capital income. The effects on the labour supply are not taken into account in the calculation of S2+.

<sup>47</sup> A more detailed description of the S2 indicator can be found in the chapter "Public finances until 2100" in NIER (2016a).

government revenue and any net financial wealth must be enough to fund discounted future government expenditure. The S2 indicator shows the degree of tightening required for the intertemporal budget constraint to be satisfied. The S2 value is expressed as a percentage of GDP, so a value of 2, for example, means that net lending needs to be tightened by 2 per cent of GDP immediately for public finances to be long-term sustainable. The S2 value can also be negative, meaning that public finances are already long-term sustainable despite various spending increases or tax cuts. Given the considerable uncertainty and long time horizon, it is, of course, inappropriate to draw firm conclusions about fiscal space and the need for tightening from the S2 indicator. It is nevertheless a useful tool for obtaining a picture of the sustainability of public finances in different scenarios.

#### **PUBLIC FINANCES LONG-TERM SUSTAINABLE IN THE BASE SCENARIO**

Table 5 provides an overview of the S2 indicator in the three scenarios. In the base scenario, the S2 value is 0.0, which means that public finances can be considered long-term sustainable without any tightening. In the scenario with unchanged behaviour, the S2 indicator suggests that public finances need to be tightened considerably to be long-term sustainable. In the scenario with reduced personnel density, the indicator points to considerable fiscal space.

**Table 5 S2 indicator in the different scenarios**

	Base scenario	Unchanged behaviour	Reduced personnel density
(1) Interest on net debt	0.0	-0.1	0.0
(2) Effect of primary deficits through to 2100	0.1	0.5	-0.3
(3) Effect of primary deficits from 2101	0.0	3.6	-4.5
S2 = (1) + (2) + (3)	0.0	4.0	-4.9
S2+	0.0	5.5	-6.6

Note: S2+ is an adjusted S2 indicator which takes account of tax-base effects and shows the percentage tightening of primary net lending required to generate an S2 value of zero with 2100 as the final year of the projections. The data in the table do not sum due to rounding.

Source: NIER.

The S2 indicator can be divided into three terms. The first term (1) specifies the increase in net lending needed to cover the cost of government net debt at the beginning of the projection period. As net debt is currently negative (there is positive net financial wealth) and capital income in the government sector exceeds its interest costs, net lending does not need to be strengthened on this account.

The second term (2) shows the tightening of net lending required to counter primary deficits during the projection period through to 2100. This term differs in each scenario according to how government expenditure develops: the larger the increase in spending, the larger this term will be. In the base scenario, it is 0.1, which means that net lending needs to be tightened by 0.1 per cent of GDP to cover the deficits projected through to 2100. The primary deficits that need to be covered are mainly in the period until 2040.

The third term (3) refers to the deficits assumed to exist after the end of the projection period. From 2101 onwards, primary net lending is assumed to remain indefinitely at the same level as in 2100 in each scenario. In the base scenario, as previously

mentioned, primary net lending is slightly positive in 2100. There is therefore no need to tighten public finances on this account.

#### **A DYNAMIC ESTIMATE OF THE S2 INDICATOR: S2+**

The S2 indicator is a static and stylised estimate which assumes that tax increases can be made without impacting on the size of the tax bases. There is, however, reason to believe that the tax bases would change following a sharp rise in taxation, with the result that taxes need to be raised even further than the constant increase indicated by the S2 value. To complement the conventional S2 indicator, we therefore also study another indicator that takes some account of this effect. Because there is no need for tax increases to achieve sustainability in the base scenario (the S2 value is zero), there are no dynamic effects. This means that the S2+ value is also zero in the base scenario. In the alternative scenario with unchanged behaviour, the need for tightening is amplified when dynamic effects are taken into account.

#### **SUSTAINABLE ACCORDING TO S2 BUT STILL A NEED FOR TAX INCREASES?**

Long-term sustainability is defined in the calculation of both S2 and S2+ as satisfying the intertemporal budget constraint. This condition is less strict than the condition that net wealth must stabilise at a certain level, as discussed in Chapter 4. For net lending to be zero every year through to 2100, the tax-to-GDP ratio needs to be raised by an average of 0.3 percentage points in the base scenario, which is slightly less than in Chapter 4 when the projections extended only to 2040. This is because primary net lending improves as 2100 approaches. The reduced need for tightening suggested by the S2 and S2+ values is because the intertemporal budget constraint is compatible with decreasing net wealth so long as net wealth stabilises in the long run. In the base scenario, net wealth falls gradually but stabilises towards 2100, albeit at negative levels.

#### **Low real interest rates mean weaker public finances**

Recent decades have seen falling real interest rates both in Sweden and globally. In the projections in this report, interest rates begin to rise this year and reach 1.0 per cent in real terms at the beginning of the 2020s. This trend then continues through to 2027, when all interest rates in the economy reach what is assumed to be the equilibrium real rate of 2.5 per cent. Since the economy is not exposed to any shocks in the projections, interest rates then hold at this level through to 2100. In the calculations in this report, equity returns mirror interest rates. This means that when interest rates reach their equilibrium level in 2027, equity returns also reach that same level and hold there.

In the following, we present a sensitivity analysis showing how fiscal sustainability is affected if interest rates take longer to normalise. Other than the return on capital, the projections are identical to the report's base scenario. Real interest rates are assumed to rise from their current low levels to 1.0 per cent in 2030 and not reach 2.5 per cent until 2040. These low interest rates also mean low equity returns through to 2040. After 2040, interest rates and equity returns are the same as in the base scenario.

There are several possible reasons for today's low interest rates, including expansionary monetary policy, an ageing population and a reduced need for capital

in the wake of digitisation.<sup>48</sup> Many commentators also predict that global productivity growth will be lower in the coming decades than it has been historically. According to macroeconomic theory, lower productivity growth will result in lower interest rates.

This analysis takes no account of the reasons why interest rates and equity returns might remain low in the future. As a result, only interest rates change; government consumption, investment and productivity growth are unchanged from the base scenario.

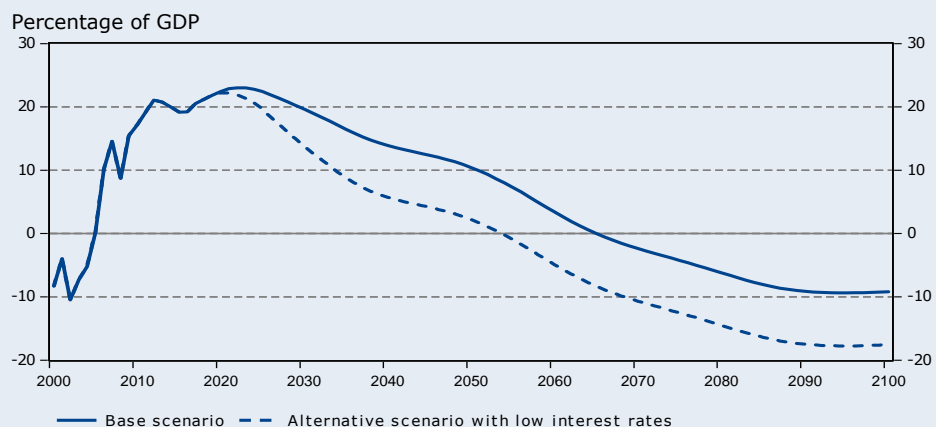
#### Lower primary net lending and net capital income

Primary net lending deteriorates when interest rates and equity returns are low for two reasons. First, households' net capital income (capital returns less interest costs) decreases when interest rates and returns are low. This results in lower government revenue from capital taxes and so erodes primary net lending. On average over the period, the reduction in tax revenue is close to 0.2 per cent of GDP.

Second, lower interest rates and returns impact on the government's net capital income. The Swedish public sector is currently in a net wealth position, so low interest rates and returns will pull down its net capital income. The lower interest rates and returns set out above mean that government net capital income in 2020–2040 is just over 0.2 per cent of GDP lower on average than in the base scenario.

Although the gap between interest rates in the two scenarios narrows in the 2030s, the difference in net capital income persists. This is due to the differences in net wealth. With both primary net lending and net capital income being lower, overall net lending falls with the result that government net wealth is lower than in the base scenario (see Diagram 34). Lower net wealth leads in turn to lower net capital income despite the gap in interest rates closing. This means that the lower net wealth will continue to generate lower net capital income after 2040 when interest rates are identical. The effect of the period of low interest rates and equity returns on net lending thus persists even after interest rates have normalised.

**Diagram 34 Government net financial wealth with low interest rates**



Sources: Statistics Sweden and NIER.

<sup>48</sup> For a summary discussion of why interest rates are low and can be expected to remain so, see Obstfeld and Tesar (2015) and Sveriges Riksbank (2017).

**Lower interest rates mean better net capital income if the public sector has net debt**

In the base scenario, net wealth turns into net debt in the mid-2060s. With lower interest rates, this happens just over a decade earlier. If the public sector had instead started with net debt, lower interest rates would have boosted net capital income. In both the base scenario and these estimates with lower interest rates, net wealth does not turn into net debt until after interest rates and equity returns have normalised.

Had the public sector initially had net debt of 20 per cent of GDP, rather than an equivalent level of net wealth, the effect of low interest rates and returns would be much smaller relative to the base scenario. This is because the reduction in revenue from household capital taxes, which erodes primary net lending, would then be offset by the increase in net capital income.

## References

- Kjellberg, A. (2017), “Andel med tjänstepension – facklig organisationsgrad, arbetsgivarnas organisationsgrad, kollektivavtalens täckningsgrad mm” [Prevalence of occupational pensions – trade union density, employer organisation density, collective agreement coverage, etc.], Department of Sociology, Lund University.
- Long-term Survey of the Swedish Economy (2015), *Huvudbetänkande* [Main report], SOU 2015:104.
- Molander, P. (1999), “Den åttafaldiga vägen – om motiv för offentligt åtagande” [The eight-branch way – on the motives for government interventions], SNS Förlag.
- NIER (2015), “The long-term sustainability of public finances”, *Occasional Studies* No. 43.
- NIER (2016a), “Fiscal sustainability report 2016”, *Occasional Studies* No. 47.
- NIER (2016b), *The Swedish Economy*, December 2016.
- Obstfeld, M. and L. Tesar (2015), “The decline in long-term interest rates”, blog post summarising *Long-term Interest Rates: A Survey*, Council of Economic Advisers, July 2015.
- Retirement Age Commission (2013), *Åtgärder för ett längre arbetsliv* [Towards a longer working life], SOU 2013:25.
- Surplus Target Committee (2016), *A Review of the Surplus Target*, SOU 2016:67.
- Sveriges Riksbank (2017), “The repo rate in the long run”, *Monetary Policy Report*, February 2017.
- Swedish Government (2016), *2016 Spring Fiscal Policy Bill* (2015/16:100), pp. 205–230.
- Swedish Pensions Agency (2016), *Orange Report 2015*.

## Appendix. Key variables for the three scenarios

**Table 6 Base scenario**

Percentage of GDP

	2017	2020	2030	2040	2070	2100
Primary expenditure	48.1	48.0	48.4	48.6	48.9	48.4
Consumption	26.4	26.4	27.6	28.1	28.2	27.8
Investment	4.4	4.4	4.5	4.6	4.6	4.5
Income pensions	6.4	6.4	5.7	5.6	5.9	6.0
Social transfers (ex pensions)	6.7	6.5	6.3	6.1	5.9	5.9
<b>With unchanged taxes</b>						
Primary revenue	47.4	47.6	47.7	48.1	48.4	48.4
Of which, taxes and duties	43.4	43.7	43.8	44.1	44.4	44.4
Primary net lending	-0.7	-0.4	-0.6	-0.4	-0.4	0.0
Capital income, net	1.0	1.0	0.2	-0.1	-0.7	-0.9
Net lending	0.2	0.6	-0.5	-0.5	-1.1	-0.9
Net financial wealth	20.5	22.4	19.7	13.9	-2.4	-9.2
Gross debt	39.6	35.1	36.3	43.9	59.3	63.9
<b>With adjusted taxes</b>						
Primary revenue	47.4	47.0	48.2	48.4	48.7	48.2
Of which, taxes and duties	43.4	43.2	44.3	44.4	44.7	44.2
Primary net lending	-0.7	-0.9	-0.2	-0.2	-0.2	-0.1
Capital income, net	1.0	0.9	0.2	0.2	0.2	0.1
Net lending	0.2	0.0	0.0	0.0	0.0	0.0
Net financial wealth	20.5	21.1	20.0	19.1	16.8	14.8
Gross debt	39.6	36.4	35.9	38.7	40.2	40.0

Source: NIER.

**Table 7 Alternative scenario with unchanged behaviour**

Percentage of GDP

	2017	2020	2030	2040	2070	2100
Primary expenditure	48.1	48.0	49.2	49.7	52.0	54.0
Consumption	26.4	26.4	28.0	29.0	30.8	32.5
Investment	4.4	4.4	4.6	4.7	4.9	5.1
Income pensions	6.4	6.4	6.0	5.6	6.0	6.1
Social transfers (ex pensions)	6.7	6.5	6.4	6.2	6.1	6.2
<b>With unchanged taxes</b>						
Primary revenue	47.4	47.6	47.9	48.2	48.7	49.3
Of which, taxes and duties	43.4	43.7	43.9	44.1	44.4	44.9
Primary net lending	-0.7	-0.4	-1.4	-1.5	-3.3	-4.7
Capital income, net	1.0	1.0	0.0	-0.6	-4.1	-10.2
Net lending	0.2	0.5	-1.3	-2.1	-7.4	-14.9
Net financial wealth	20.5	22.4	15.9	0.8	-80.9	-221.5
Gross debt	39.6	35.1	38.4	54.2	135.8	275.3
<b>With adjusted taxes</b>						
Primary revenue	47.4	47.1	49.0	49.5	51.8	53.9
Of which, taxes and duties	43.4	43.2	45.0	45.4	47.6	49.5

Note: Primary net lending, capital income, net lending, net financial wealth and gross debt with adjusted taxes are not reported for this alternative scenario as they are practically identical to the base scenario with adjusted taxes.

Source: NIER.

**Table 8 Alternative scenario with reduced personnel density**

Percentage of GDP

	2017	2020	2030	2040	2070	2100
Primary expenditure	48.1	48.0	47.7	47.1	45.2	42.7
Consumption	26.4	26.4	27.0	26.7	24.8	22.6
Investment	4.4	4.4	4.5	4.5	4.3	4.1
Income pensions	6.4	6.4	5.7	5.6	5.9	6.0
Social transfers (ex pensions)	6.7	6.5	6.3	6.1	5.9	5.9
<b>With unchanged taxes</b>						
Primary revenue	47.4	47.6	47.8	48.2	48.3	47.9
Of which, taxes and duties	43.4	43.7	43.9	44.2	44.5	44.2
Primary net lending	-0.7	-0.4	0.1	1.1	3.2	5.3
Capital income, net	1.0	1.0	0.3	0.6	3.8	10.3
Net lending	0.2	0.6	0.4	1.7	7.0	15.6
Net financial wealth	20.5	22.4	23.3	29.8	99.9	247.4
Gross debt	39.6	35.1	32.4	27.4	-44.5	-194.9
<b>With adjusted taxes</b>						
Primary revenue	47.4	47.0	47.5	46.9	45.0	42.5
Of which, taxes and duties	43.4	43.2	43.6	43.0	41.1	38.7

Note: Primary net lending, capital income, net lending, net financial wealth and gross debt with adjusted taxes are not reported for this alternative scenario as they are practically identical to the base scenario with adjusted taxes.

Source: NIER.