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Simulations for the 4th Sustainability Report

Summary

Study

commissioned by the
German Federal Ministry of Finance

Authored by

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SUMMARY

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Main Results at a Glance

A. Tasks

In regularly reporting on the sustainability of public finances, the German Federal Ministry of Finance wants to monitor the consequences of demographic ageing and the resulting long-term risks for public budgets in Germany that may be relevant for decisions on fiscal policy already today. The precise dynamics of demographic ageing and its economic impact are subject to numerous uncertainties. Nevertheless, running illustrative simulations that cover a variety of scenarios can provide an orientation about the order of magnitude and the possible spread of future budgetary risks. This is the task of the present study which was commissioned by the ministry and has been prepared by Martin Werding, Ruhr-Universitaet Bochum.

The simulations relate to public expenditure in a number of areas that must be expected to be particularly responsive to population ageing: the Statutory Pension Scheme, Statutory Health Insurance and Social Insurance for Long-term Care; systems providing for pensions and health benefits for civil servants; Unemployment Insurance and Income Support for individuals in long-term unemployment; public expenditure on child care and education; and the main financial benefits for families. Expenditure on any of these budget items are projected until 2060, building on the current legal framework (as of 30 June 2015). The simulations are based on the most recent up-date of population projections prepared by the Federal Statistical Office and a macro-economic background scenario. They also take into account the medium-term projection of the Federal Government for macro-economic developments until 2019 (as of Spring 2015) and key figures from current medium-term fiscal planning (updated until Autumn 2015). Long-term trends in age-related expenditure are simulated taking into account changes in the age composition of the population and any differentiations by age, gender, employment status, and membership status in different branches of the social protection system, also reflecting any relevant time and cohort effects. Results are assessed using indicators for the sustainability of public finances that have been developed by the EU Economic Policy Committee.

B. Baseline scenarios: assumptions

The study initially focuses on two baseline scenarios which are based on diverging assumptions regarding long-term trends in demographic fundamentals, labour-force participation and employment, aggregate growth and other aspects of macroeconomic performance. Throughout, assumptions made for scenario T– are basically pessimistic, those made for scenario T+ are optimistic with respect to their consequences for fiscal sustainability (where "T" means "*Tragfähigkeit*", *i.e.*, sustainability). Taken together, the two scenarios are meant to indicate a plausible range for future developments

that may possibly materialize. The main assumptions regarding demography, labour market and economic growth are summarized in Table 1.

Table 1: **Assumptions for the baseline scenarios**

	2010	2020	2030	2040	2050	2060
			Scenario T–			
Demography:						
Population (mill.)	81.7	81.5	79.6	76.8	73.2	69.2
Old-age dependency [a]	31.1	35.1	46.9	54.7	58.6	64.1
Labour market:						
Participation rates (%)						
– females (15–64)	74.6	79.6	82.2	82.5	83.0	83.5
– males (15–64)	84.5	85.4	86.0	85.9	85.9	86.1
Labour force (mill.)	43.8	44.6	42.2	38.8	36.4	33.4
Employment (mill.)	41.0	43.0	39.9	36.7	34.4	31.6
Unemployment rate [b] (%)	6.4	3.8	5.5	5.5	5.5	5.5
Economic growth:						
Labour productivity [c] (%)	0.6	1.0	1.9	1.8	1.6	1.6
GDP [c] (%)	0.9	1.4	1.1	0.9	0.9	0.7
GDP per capita [c] (%)	0.9	1.4	1.4	1.3	1.4	1.3
			Scenario T+			
Demography:						
Population (mill.)	81.7	82.2	81.9	80.6	78.8	76.9
Old-age dependency [a]	31.0	34.7	45.0	50.2	51.2	53.7
Labour market:						
Participation rates (%)						
– females (15–64)	74.6	78.5	82.6	82.8	83.3	84.0
– males (15–64)	84.5	85.0	86.5	86.4	86.4	86.7
Labour force (mill.)	43.8	44.8	43.9	41.8	40.9	39.4
Employment (mill.)	41.0	43.2	42.6	40.6	39.8	38.3
Unemployment rate [b] (%)	6.4	3.6	3.0	3.0	3.0	3.0
Economic growth:						
Labour productivity [c] (%)	0.6	0.9	1.9	2.0	1.8	1.9
GDP [c] (%)	0.9	1.4	1.8	1.5	1.6	1.5
GDP per capita [c] (%)	0.9	1.4	1.8	1.7	1.9	1.7

Annotations:

a)   Population aged 65+ per population aged 15–64.
b)   % of total labour force (internationally standardised definition).
c)   Real growth rates (annualised averages over the last 10 years).

Sources: Figures for 2010 are based on actual data provided in official data sources; all other figures are based on simulations using the SIM.13 model („Social Insurance Model, 2013 version").

Figure 1:   **Aggregate expenditure ratio, 2000–2060**
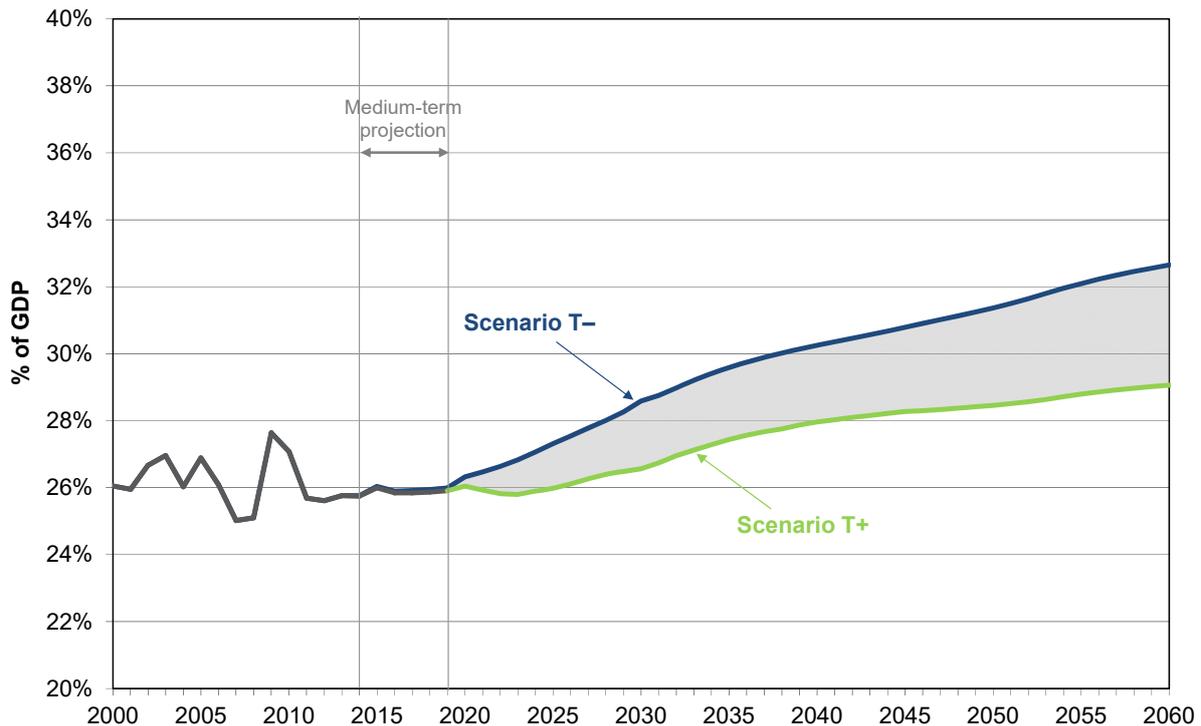
Annotations: Aggregate expenditure ratios are based on expenditure of the Statutory Pension Scheme, Statutory Health Insurance, Social Insurance for Long-term Care, pensions and health benefits for civil servants, Unemployment Insurance, income support for job-seekers, education and child care, and financial benefits for families, consolidated for payments between the different sub-budgets involved.

Sources: Federal Statistical Office; German Pension Insurance; Federal Ministry of Health; Federal Employment Agency; Federal Ministry of Labour and Social Affairs; Federal Ministry of Finance; SIM.13 („Social Insurance Model, 2013 version").

C. Baseline scenarios: results

Aggregate expenditure on all budget items which are covered by the simulations – consolidated for payments between different sub-budgets – amounts to 25.8 percent of GDP in 2014 (see Figure 1). This corresponds to almost 60 percent of total general government expenditure. In most recent medium-term projections of the Federal Government, it is expected that this ratio will stay largely stable until 2019. In the pessimistic baseline scenario T–, however, the expenditure ratio will start increasing soon afterwards. Projected increases are particularly strong until 2035, but will continue at a more moderate speed until 2060. At the end of the simulation period, the ratio will reach 32.7 percent. In the optimistic baseline scenario T+, the upward trend in expenditure is most pronounced between 2025 and 2040, and the ratio will reach 29.1 percent by 2060. Total increases in expenditure are thus projected to range between 3.3 and 6.9 percentage points of GDP compared to 2014.

Demographic ageing has a particularly strong impact on public expenditure on old-age provision, mainly the Statutory Pension Scheme. However, following a series of reforms enacted between 2001 and 2007, pension expenditure is projected to increase far less sharply than old-age dependency does. More recent changes in the legal framework lead to higher expenditure on some types of benefits as a lasting effect, but do not overturn this observation. Expenditure on pensions for civil serv-

ants will also increase rather strongly, which mostly hits the budgets of the German *Länder* and municipalities. By comparison, expected increases in expenditure of the Statutory Health Insurance are smaller, at least if projections focus on the effects of changes in the age composition of the population under the current legal framework. Other drivers of health expenditure that are considered in alternative scenarios lead to considerable upward and downward risks. Given recent expansions of benefits and the projection approach applied in the baseline scenarios, increases in expenditure on long-term care are likely to be substantial. Using an alternative approach (with inflation-adjustments instead of wage-adjustments of benefits), this increase would largely disappear. Future expenditure on the unemployed are mostly dependent on assumptions regarding labour-market performance. Thus, they differ substantially between the two baseline scenarios. Projected changes in expenditure on education and families are small. They become a little more prominent under the assumption that fertility will start rising against the current low level.

Figure 2:   **Projected debt ratio, 2000–2060**
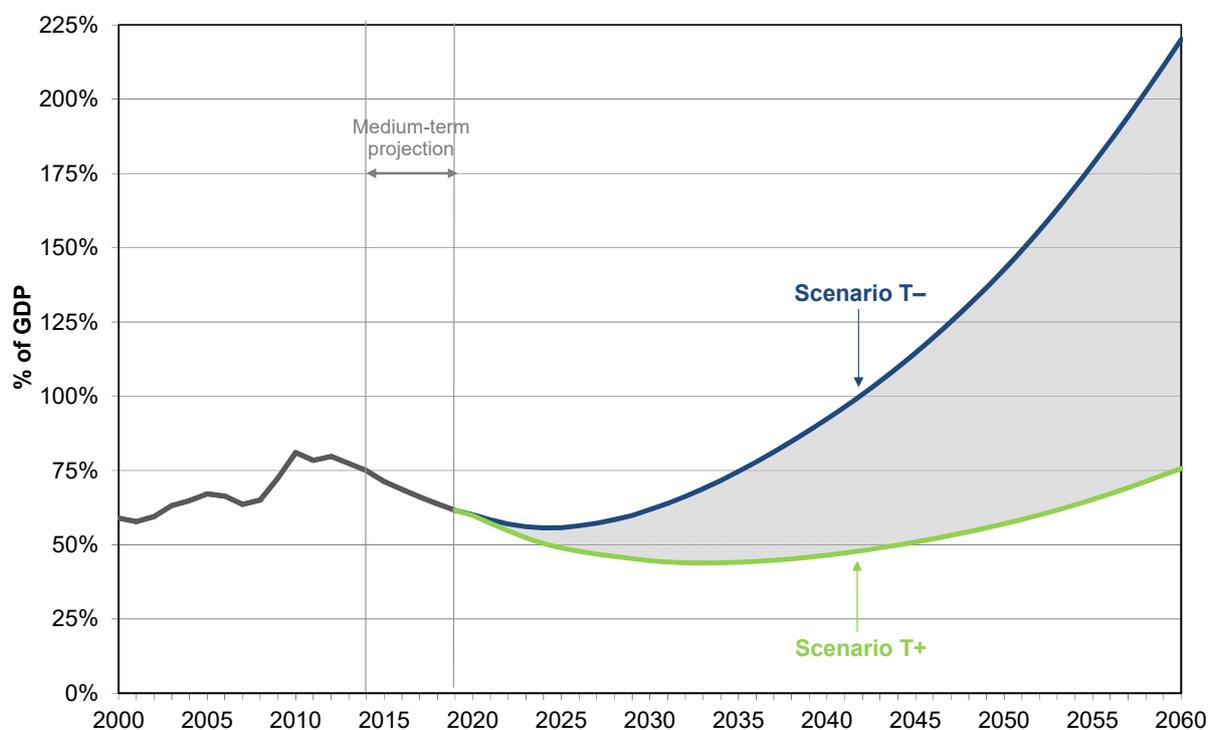
Annotations: Projected trends in the debt ratio are derived from projections for aggregate expenditure, assuming that other public expenditure and public revenues remain constant as a percentage of GDP.

Sources: Federal Statistical Office; Medium-term projection of the Federal Government; SIM.13 („Social Insurance Model, 2013 version").

Keeping all other public expenditure and total public revenues constant in terms of their shares in GDP, projected changes in expenditure ratios directly turn into a deterioration of the primary balance of the general-government budget. Adding interest payments on accumulated public debt, this leads to increasing deficits in the total budget balance. Compound interest then drives the debt ratio as well as the total deficit ratio up at accelerating speed (see Figure 2). In the optimistic variant T+, this process is not very pronounced: the debt ratio temporarily declines to about 45 percent of GDP and then rises again to about 75 percent until 2060. In the pessimistic scenario T–, the process is clearly

visible, with an increase in the debt ratio to 220 percent of GDP. Still, these results look less unfavourable than those obtained when preparing the 3rd Sustainability Report in 2011. The main reason for this is a favourable current fiscal stance. After the Great Recession, the German economy has recovered remarkably fast, and fiscal policy has been relatively tight. Consolidation efforts of considerable size have been made which still had to be taken in the short to medium run in the context of earlier sustainability analyses. Current results are therefore much more reliable in the sense that they are no longer contingent on improvements not yet achieved. At the same time, the projections used here do not fully reflect the effects of the large in-flow of refugees to Germany which is currently going on. It appears that resulting amounts of unanticipated expenditure need not create risks for reaching existing short-term and medium-term fiscal objectives. But they may take away the leeway for achieving further improvements in the sustainability of public finances in the near future.

Table 2: **Sustainability indicators**

Indicators	Scenario T+	Scenario T−
Long-term sustainability gaps (immediate adjustments starting in 2016)		
$S1$ [a)]	0.27	2.31
$S2$ [b)]	1.22	3.81
Medium-term indicators (gradual adjustments from 2016 to 2020)		
1) cumulative consolidation need ("sustainability gaps")		
$S1^{2030}$ [c)]	−1.10	0.15
$S2^{mt}$ [b)]	1.25	3.94
2) annual adjustments until 2020		
$s1^{2030}$ [c)]	−0.22	0.03
$s2^{mt}$ [b)]	0.25	0.79

Annotations: All figures indicate reductions required in annual primary deficits of the general-government budget, measured as a percentage of GDP.

Underlying fiscal objectives:

a) Reaching a debt ratio of 60 % of GDP by 2060.
b) Observing the intertemporal government budget constraint over an infinite time horizon.
c) Reaching a debt ratio of 60 % of GDP by 2030.

Source: SIM.13 („Social Insurance Model, 2013 version").

Consequences of demographic ageing for the sustainability of public finances are gauged using several indicators (see Table 2). The long-term indicator $S2$ provides the most comprehensive measure of any sustainability gaps. The medium-term indicator $S2^{mt}$ has similar characteristics. Both indicators measure improvements in annual primary budget balances (by a constant percentage of current GDP) which – under the assumption that current policy is otherwise unchanged – would be required in order to be able to cover outstanding public debt and all future public expenditure (*i.e.*, to meet the intertemporal government budget constraint). For $S2$, improvements in primary balances have to be achieved at once starting from 2016; for $S2^{mt}$, they are phased in over a consolidation period lasting from 2016 to 2020. In addition, further long-term and medium-term indicators are assessed which the EU Commission has been ($S1$) or is ($S1^{2030}$) using in parallel work. Since their fiscal objectives are defined more narrowly, these indicators tend to underestimate existing sustainability risks.

Figures deriving from the projections for the indicators show that, under current policies, German public finances exhibit sustainability gaps of some size in both of the baseline scenarios. In scenario T+, long-term indicator $S2$ amounts to 1.1 percent, in scenario T– to 3.7 percent of GDP. Taking these results to indicate a plausible range for future developments, the primary balance of the general government budget ought to be improved – immediately and throughout the simulation period – by about € 35 bn under favourable conditions and by about € 110 bn under unfavourable conditions. If these adjustments are to be spread over period from 2016 to 2020 ($S2^{mt}$), cumulative consolidation steps required in each year are about € 7.2 bn and € 22.9 bn, respectively.

D. Alternative scenarios

Simulations for the two baseline scenarios are supplemented by numerous alternative scenarios. This is done in order to assess the sensitivity of results with respect to specific assumptions, to illustrate uncertainties about future developments in particular areas, to highlight the effects of reforms which have already been taken, or to identify fields where further changes in the legal framework appear to be promising with regard to securing the sustainability of public finances.

First of all, by comparing the two baseline scenarios T+ and T– it is shown in some detail how the differing results are driven by the underlying assumptions which tend to be rather optimistic *vs*. pessimistic. Projected increases in life expectancy and projected migration flows turn out to have considerable effects. Most notably, a favourable situation on the labour market appears to be very important for dealing with sustainability risks caused by ageing populations. Net immigration is particularly beneficial if – against the background of a strong labour-market performance and a quick integration of immigrants into employment – it takes the form of permanently higher in-flows. Temporary waves like those observed over the past few years mitigate the projected increase in expenditure ratios only for a while but accelerate it again later on; the very recent wave of refugees may even lead to higher expenditure in the short run. Confining or even reversing the aging process in the long run actually requires a substantial increase in fertility. However, following several decades with low birth rates, the effects would unfold too slowly to be fully captured by the sustainability analyses conducted in this study. Initially, they would be off-set by higher expenditure on children and their education. Higher productivity growth tends to have little impact on the fiscal consequences of ageing. Under current rules, it accelerates both GDP growth and the projected increase in public expenditure covered in the simulations. Expenditure per GDP is therefore largely unaffected. It is possible though that higher income and prosperity facilitate helpful policy changes, for instance, if they weaken the link between productivity growth or GDP growth on the one hand and the looming increase in public expenditure on the other.

Substantial risks for the sustainability of public finances arise from uncertainties about future trends in health expenditure. This becomes apparent if, besides changes in the age composition, further determinants are taken into account. "Healthy ageing" that goes along with corresponding reductions in age-specific morbidity as well as the impact of medical progress and other non-demographic drivers on health costs can lead to more favourable, but also to far more unfavourable long-term trends in this field than those obtained for the baseline scenarios. Uncertainties about future interest rates turn out to be of little significance. The sustainability indicators used here are basically not very

sensitive with respect to assumptions on interest rates. It can be shown that even a lasting period with very low interest would not contribute to alleviating the impact of ageing on public finances.

Further alternative scenarios are considered to identify changes which would improve on the fiscal sustainability and could be supported by public policy in one way or another. This is true, for instance, for further increases in female labour-force participation, while taking into account that this may require additional expenditure n child care and also on institutional arrangements for long-term care instead of home care. It also applies to further increases of the retirement age after 2030 – that is, after the on-going expansion of the legal retirement age has expired. Beneficial effects of a stronger increase which takes places at an earlier stage would phase out over the projection period.

Nevertheless, the series of reforms which have already been taken in recent years has substantially reduced the existing sustainability gap. For example, reforms of the Statutory Pension Scheme enacted in 2004 and 2007 (introduction of a "sustainability factor" in annual benefit up-ratings; increase in the statutory retirement age from 65 to 67 until 2029) and similar reforms of civil servants' pensions enacted in 2009 (at the federal level, meanwhile replicated at the state level in numerous cases) had considerable effects of this kind. Reforms aimed at strengthening competition in the health-care sector were also important, even though their consequences for expenditure of the Statutory Health Insurance scheme cannot be quantified as precisely as those of other reforms. Also, efforts taken to consolidate public budgets since 2010 had a favourable impact. *Per se*, most recent reforms of the pension scheme and amendments in the long-term care insurance scheme had small, but lasting negative effects which are compromising the progress reached.

A final series of alternative scenarios looks at potential consequences of future fiscal policies. They illustrate that any delay in fiscal consolidation increases sustainability indicators. They demonstrate how sustainability deteriorates if short-term or medium-term budgetary risks materialise which are not captured in current medium-term and long-term projections. Last but not least, they show that closing the sustainability gap mainly by increasing public revenues through higher taxes or social security contributions and not by reducing public expenditure will drive up effective consolidation needs through unfavourable repercussions on employment and growth.

E. Comparisons with the EU Ageing Report 2015

Results of the simulations which have been prepared for the 4th Sustainability Report of the German Federal Ministry of Finance can be compared with those published in the "Ageing Report 2015" of the European Commission and the EU Economic Policy Committee earlier this year. At least, this applies to projections on age-related public expenditure, while EU-level assessments regarding the sustainability of public finances will not be available until the next "Sustainability Report" of the European Commission will be released (expected at the beginning of the year 2016). The comparison shows many differences regarding various details, starting from the precise definition of the budget items covered in the projections. Also, the EU Ageing Report presents what is called the "AWG reference scenario" as a single baseline scenario, while the simulations for the national sustainability report are built on two diverging baseline scenarios which are deliberately designed to be rather pessimistic on the one hand and rather optimistic on the other. Furthermore, the simulations run at the EU level follow a convergence approach regarding some of the assumptions made, where long-term trends

tend to align with each other for different (sub-groups of) EU member states. From a national perspective, this does not always appear to be plausible.

When looked at in full detail, the differences which can be observed are as follows. The population projection adopted for the Ageing Report – *viz.*, the "Main scenario" of the most recent projections prepared by Eurostat ("EUROPOP 2013") – is based on long-term assumptions which are similar to the baseline scenario T+ formed in this study. However, it does not fully capture the high in-flow of immigrants observed in 2013/14 which is currently continuing. In projecting future labour supply, the Ageing Report may also underestimate the dynamics of female labour-force participation in Germany which has increased considerably already in recent years. EU-level assumptions regarding future trends in unemployment and the growth of labour productivity appear to be conservative, but basically plausible. Projections for public expenditure show smaller increases than those prepared here regarding old-age provision (pensions covered by the Statutory Pension Scheme and by the civil servants' scheme). This mainly reflects the differences in assumptions on immigration and female labour-force participation. Results obtained for public expenditure on health care (Statutory Health Insurance scheme and corresponding expenditure for civil servants and their family members) and long-term care (Social Insurance for Long-term Care and, again, relevant expenditure for civil servants; with additional items not captured in the national projections) are much in line with each other across the two sets of projections. This is due to the fact that they use similar modelling approaches and take into account much the same determinants of future developments in these areas. Similar things apply to the projections for expenditure on the unemployed (with a concentration on benefits provided by the Unemployment Insurance scheme) and public expenditure on education.

Differences in the precise definition of the budget items included imply that the EU Ageing Report covers public expenditure that currently amounts to 23.9 percent of GDP in Germany. Over the projection period which also spans the years until 2060, they are expected to increase by 5.0 percentage points, to 29.0 percent. Correcting for the differences in the definition of relevant expenditure, the simulations conducted here relate to the same amount of expenditure in the initial year (instead of 25.8 percent of GDP actually covered) and project it to increase by only 3.5 percentage points in scenario T+ or by no less than 7.9 percentage points in the scenario T–. This appears to be fully in line with the intention to construct two diverging baseline scenarios – an optimistic one and a pessimistic one. In spite of existing differences, both the simulations prepared at the EU level as well as those prepared from a national perspective consistently emphasize that, in the case of Germany, demographic ageing will most likely cause a substantial increase in public expenditure and puts the sustainability of public finances at risk.