The Czech Fiscal Council

REPORT ON THE LONG-TERM SUSTAINABILITY OF PUBLIC FINANCE

September 2023
Czech Fiscal Council

Report on the Long-Term Sustainability of Public Finances

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Introduction and summary of the main trends

One of the key tasks of the Czech Fiscal Council (CFC) under Act No. 23/2017 Coll., on the Rules of Budgetary Responsibility, as amended (the Act), is the regular annual preparation of the **Report on the Long-Term Sustainability of Public Finances** (the Long-Term Sustainability Report) and its submission to the Chamber of Deputies of the Parliament of the Czech Republic.

As in previous Long-Term Sustainability Reports, this year's CFC assesses the situation of Czech public finances from a **medium- and long-term perspective.** In the first case, the key indicator is the current structural balance, while in the second case it is the projected path of public debt over a 50-year horizon, which shows the extent of long-term fiscal imbalances.

Fortunately, the Czech public finances have already moved away from the high deficits in the 5–6% of GDP range typical of the years associated with the COVID-19 pandemic (2020–2021), but they have still not taken a clear trajectory towards sustainable and macroeconomically sound levels defined by the original text of the Act.

Public finances are therefore at an imaginary crossroads. Right now, this year and in the years to come, it is being decided what their structural adjustment will be in the post-covid era, and how robust a support (or, conversely, how massive a burden) they will represent for the Czech Republic's macroeconomic development in the future. **Therefore, even in this Long-Term Sustainability Report, the CFC considers developments in the area of public budgets to remain a crucial issue for the country's economic future**.

If last year the Long-Term Sustainability Report spoke of significant imbalances in public budgets and the need to consolidate public finances, this year we are in a slightly different situation, as the **first serious attempts to change the unfavourable trends are emerging (the so-called consolidation package and proposals to adjust the pension system).** At the time of writing this Long-Term Sustainability Report, it is not yet certain in what final form all these proposals will be adopted, but the CFC has already appreciated their submission and the serious efforts to push them through politically during 2023 and supports the proposals in their entirety (despite possible objections to individual sub-measures). This is all the more true given that they have emerged at a time of a receding energy crisis and the ongoing Ukraine crisis. Both have required a number of additional fiscal measures on the expenditure side of public budgets (compensation for high energy prices, aid to refugees from Ukraine) as well as, on the revenue side (windfall tax). In this context, the CFC appreciates the efforts to compensate for the one-off expenditure related to both crises also by securing temporary additional revenue and not only by increasing the deficit. On the other hand, some of the steps taken in previous years with reference to the covid crisis, although unrelated to it, continue to significantly worsen the structural balance of public budgets and its outlook. The main example is the drastic reduction in personal income tax approved at the end of 2020, which, among other things, has contributed to the inflationary pressures that the Czech economy has faced in the last year.

One of the current problems of Czech public finances is the **trend of expanding the mechanism of automatic indexation and valorisation of important expenditure blocks.** In 2022 and 2023, it has been confirmed that in periods of high price growth, these automatic indexations have significantly negative effects on public budgets. The Czech Republic entered the COVID-19 pandemic with automatic valorisation in the area of the largest expenditure item of public budgets, i.e. pensions**. However, by 2024, the Czech Republic will enter with automatic indexation already enacted in four of the largest expenditure items of the fiscal system** (apart from pensions, these will be education financed by municipalities and regions, i.e., from pre-schools through to vocational colleges, health care, and defence). Even the planned indexation adjustments in the area of pensions in particular do not compensate for these indexations in other public budget items (see Chapter 3).

The CFC attributes this and the inhibiting of public budget revenues in recent years, which the CFC has addressed in previous Long-Term Sustainability Reports, to the fact that the basic measure of the current imbalance of public finances, the **structural deficit, does not show a tendency to improve significantly.** Unfortunately, even the parameters of the state budget for 2024 presented so far do not point to a significant change in this trend. There is a certain 'entrenchment' or 'blockage' of the structural deficit at a level exceeding 2% of GDP regardless of consolidation. Or rather, part of the consolidation effort is absorbed by the need to compensate for the performance of the same government that is painfully consolidating at the same time. From the CFC's point of view, it will therefore require considerable effort and extraordinary budgetary discipline if the government is to truly deliver on its ambition to reduce the public deficit permanently below 3% of GDP, as committed in its programme statement.

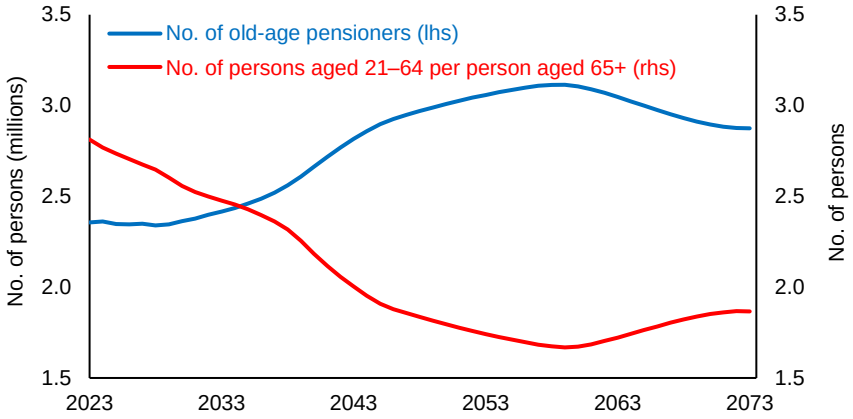
For this reason too, the CFC accepted the proposal to amend the Act, which sets out the trajectory of the reduction of the structural balance for the coming years in quantitatively clear terms (see subsection 1.1, Chart 1.1.1), although this trajectory is no longer in line with the CFC's understanding of the logic of the Act, as communicated in last year's Long-Term Sustainability Report, and as incorporated into the original text of the Act.

A clear expression of the will to address the structural balance problem has at least had the effect of halting the deterioration of this indicator after a long time and a hint of better values in the future.

Of course, the Long-Term Sustainability Report focuses on important long-term trends in the pension system, which, together with demographic developments, will fundamentally determine the state of public finances in the coming decades. The projections in the so-called baseline scenario do not yield significantly different results than those presented in last year's Long-Term Sustainability Report. However, **as shown in Chapter 3 and especially in the scenarios in Chapter 5, the proposed changes to the pension system do imply a significant increase in the sustainability of public finances over the horizon targeted by the Long-term Sustainability Report. But only if they are not only implemented but also sustained in the future**.

The CFC will continue to pay close attention to all these and other planned changes in public budget systems and their implications, to analyse them critically and to explain them as much as possible in public communication, which it considers to be one of the core parts of its statutory mandate.

KEY FINDINGS in the baseline scenario

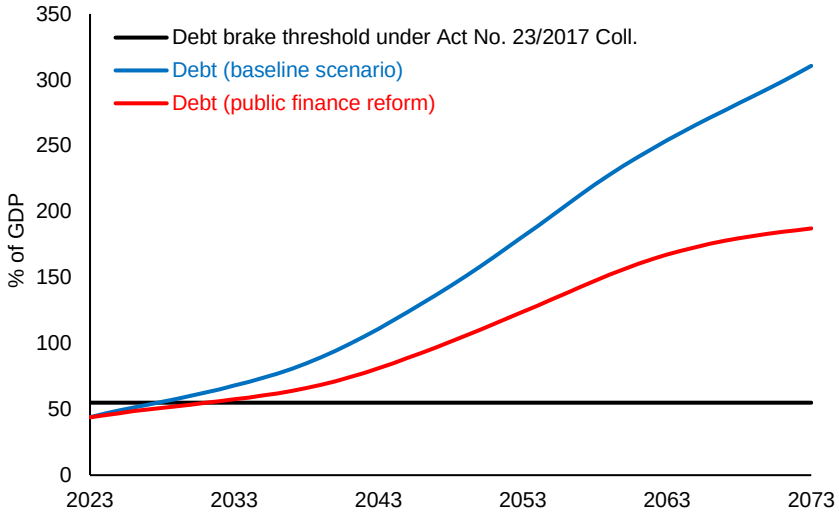


The number of old-age pensioners will peak around 2058 at about

3.1 million.

The number of 21–64 year olds per person aged 65+ will drop around 2059 to

1.67.

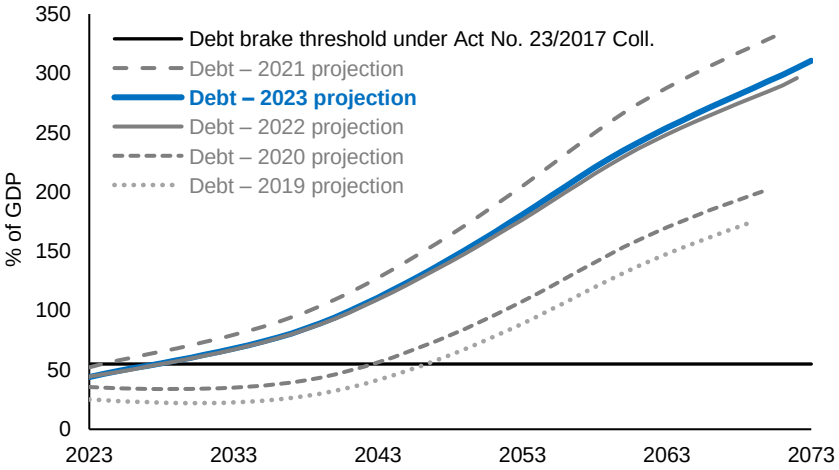


The ratio of general government debt to GDP could reach up to the end of the 50-year horizon under the current tax and spending policy settings

311% of GDP.

If the so-called public finance reform in the area of pensions is implemented and the revenue measures of the consolidation package are implemented, the debt-to-GDP ratio at the end of the projection could be lower and reach

187% of GDP.



The ratio of general government debt to GDP in the baseline scenario is at the end of the 50-year horizon

15 pp higher,

than it was in the projection in 2022. According to the current projection, the debt brake threshold would probably be breached in

2028,

i.e. the same year as in the previous projection.

Public finance sustainability gap

6.2% of GDP

is the amount by which the primary structural balance would have to be better from 2023 until 2073 for the debt not to exceed the debt brake threshold (55% of GDP) in 2073.

1 Starting point

In particular, we assess fiscal policy in relation to past and current developments in the business cycle and responses to unexpected events (e.g. the COVID-19 pandemic or the war in Ukraine). Although the Ministry of Finance of the Czech Republic (MF CR) has published forecasts for the following years 2024–2026,[1] in this section of the Long-Term Sustainability Report we limit our discussion to the period up to 2023 only. This is due to the presence of significant uncertainty in the forecasts related to the exact form of the so-called consolidation package[2] or the final form of the expenditure covered by the National Recovery Plan loan.[3] A further downstream problem is the relatively high inconsistency of the presented outlooks of the MF CR, where, for example, in April 2023, the MF CR presented an expected structural balance for 2024 of –2.6% of GDP in the framework of the Convergence Programme of the Czech Republic, while in May 2023, according to the accompanying documentation of the draft consolidation package, it was supposed to be approximately –1.4% of GDP. However, already in June 2023, the limiting structural balancein the Budget Strategy was –2.75% of GDP.[4]

1.1 Development of the public sector in 2022 and outlook for 2023

Real gross domestic product (GDP) growth in the Czech Republic reached 2.4% in 2022, driven mostly by a trade surplus (1.4 pp) thanks to increased foreign demand. GDP growth was positively influenced by gross fixed capital formation (0.8 pp), with non-financial corporations dominating investment activity thanks, inter alia, to the aforementioned rising foreign demand and investment in renewable energy sources and energy saving in production. The change in inventories (0.9 pp) also contributed to the increase, reflecting business concerns related to problems in global supply chains, although these concerns were lower compared to 2021. In contrast, the balance of the services balance (–0.5 pp) had a negative impact on GDP growth, mainly due to transport services (higher fuel and container transport prices, higher transport costs related to the geopolitical situation in Europe) and increased interest of Czech residents in foreign outbound tourism. GDP was also negatively affected by a decrease in households' final consumption expenditure (–0.3 pp) due to a decline in real incomes. Over the business cycle, the Czech economy was slightly above its potential in 2022 (positive output gap of 0.2% of potential output).[5]

The economic development also affected the economic performance of the general government sector, whose balance reached –3.6% of GDP in 2022.[6] The central government deficit had the largest impact on the balance (4.4% of GDP). Local government recorded a surplus for the tenth consecutive year (0.8% of GDP). Social security funds had a virtually balanced balance.

The structural deficit of the public sector in 2022 was 2.8% of GDP[7]. The structural deficit limit for 2022

[1] See e.g. MF CR (April 2023): The Convergence Programme of the Czech Republic, with forecasts for 2024–2026; MF CR (June 2023): Rozpočtová strategie sektoru veřejných institucí České republiky na léta 2024 až 2026 [The Budget Strategy of the Public Sector of the Czech Republic for 2024–2026, available in Czech only].

[2] The exact title is " Návrh zákona, kterým se mění některé zákony v souvislosti s konsolidací veřejných rozpočtů", zkráceně též „Návrh zákona o konsolidaci veřejných rozpočtů" [Bill Amending Certain Laws in Connection with the Consolidation of Public Budgets", also abbreviated as "Bill on the Consolidation of Public Budgets", available in Czech only]. See also: https://www.mfcr.cz/cs/dane-a-ucetnictvi/dane/danova-a-celni-legislativa/2023/ministerstvo-financi-k-ozdravnemu-balick-51537. For the current legislative process, see: https://www.psp.cz/sqw/text/tiskt.sqw?O=9&CT=488&CT1=0 (available in Czech only).

[3] See also Box 3 in the CFC (2023): The Report on Compliance with the Rules of Budgetary Responsibility for 2022.

[4] Figure of the structural balance for 2024 according to the Convergence Programme – see MF CR (April 2023): Convergence Programme of the Czech Republic. Figure of the balance from the consolidation package – see https://www.mfcr.cz/cs/aktualne/tiskove-zpravy/2023/vlada-predstavila-ozdravny-balicek-za-be-51211/, Závěrečná zpráva z hodnocení dopadů regulace (RIA) k návrhu zákona, kterým se mění některé zákony v souvislosti s konsolidací veřejných rozpočtů [Final Report of the Regulatory Impact Assessment (RIA) on the Draft Law Amending Certain Laws in Connection with the Consolidation of Public Budgets, available in Czech only] (https://odok.cz/portal/veklep/material/KORNCS3JLKC2/). The cyclical component and one-off and other temporary operations are based on MF CR (April 2023): Convergence Programme of the Czech Republic. For the figure of the limit balance according to the Budget Strategy, see MF CR (June 2023): Rozpočtová strategie sektoru veřejných institucí České republiky na léta 2024 až 2026 [The Budget Strategy of the Public Sector of the Czech Republic for 2024–2026, available in Czech only]

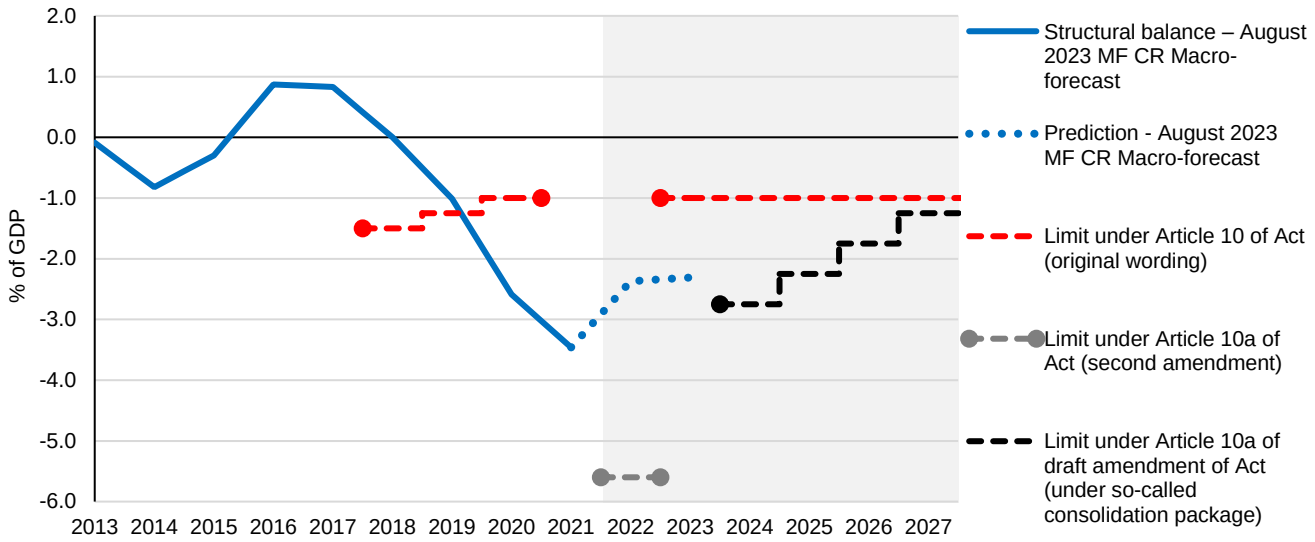
[5] MF CR (August 2023): Macroeconomic Forecast of the Czech Republic.

[6] CZSO (2023): National Accounts Database (update 30 June 2023). MF CR (August 2023): The macroeconomic forecast of the Czech Republic shows a total balance of the public sector of –3.2% of GDP. The improvement in the balance of CZK 31.2 billion is due to higher corporate income tax revenue in 2022 than was considered by the Czech Statistical Office (CZSO) during the so-called first notifications in April 2023.

[7] The calculation of the structural balance uses the total general government balance according to the CZSO (2023): Notification of the general government deficit and debt - 2022 (First notification, data notified by Eurostat) published on 21 April 2023. The cyclical component of the balance and one-off and other transitory operations were taken from MF CR (August 2023): Macroeconomic Forecast of the Czech Republic. Chart 1.1.1 shows the figure of the structural balance for 2022 and 2023 according to the MF CR (August 2023).

was derived according to Section 10a of the Act[8] according to the value of the structural deficit for 2021, which was forecasted by the MF CR in September 2021 at the latest, increased by 0.5 pp. According to the August 2021 Macroeconomic Forecast of the Czech Republic by the MF CR, from which the limit for the following period was derived, the structural deficit for 2021 was forecast at 6.1% of GDP, and therefore the limit for 2022 was 5.6% of GDP.[9]

Chart 1.1.1 General government structural balance



Sources: MF CR (August 2023): Macroeconomic Forecast of the Czech Republic, the Act (various versions), Bill on the Consolidation of Public Budgets; CFC calculations.
Note: The structural balance for 2022 is derived from the total balance of the public sector –3.2% of GDP according to the MF CR (August 2023). This updated value of the 2022 balance has not yet been published by the CZSO in the framework of the so-called second notifications (October 2023). Therefore, we consider the structural balance for 2022 presented in Chart 1.1.1 to be a forecast and in the text of the Long-term Sustainability Report we present the overall sector balance for 2022 at –3.6% of GDP (according to the first notifications of April 2023), or the structural balance derived from it according to the adjustments presented in footnote 7.

A comparison of the achieved and the 2022 structural balance limit (Chart 1.1.1) shows a very large deviation. This is mainly because the 2022 limit was set very loosely under the second amendment to the Act of the end of 2020 and cannot be seen as a targeted ("optimal") value of the balance consistent with the sustainability of public finances.

However, the main problem, which the CFC has pointed out on numerous occasions (see, for example, the 2022 Long-Term Sustainability Report), was the fiscal policy response to the COVID-19 pandemic. Thus, this response changed the composition of public sector revenue and expenditure, which is reflected in the decline in the structural balance in the post-2020 period (Chart 1.1.1). Such fiscal expansion has contributed to a rise in the inflation rate.

For 2023, the structural balance is estimated at –2.3% of GDP (see the blue dotted line in Chart 1.1.1) and the overall balance –3.6% of GDP.[10] However, the actual level of the 2023 balance will be affected by a number of uncertainties. The key ones include the non-participation of planned revenues from the Modernisation Fund, lower than expected value added tax collection and the additional pension indexation in June 2023. On the other hand, better corporate tax collection is expected.[11]

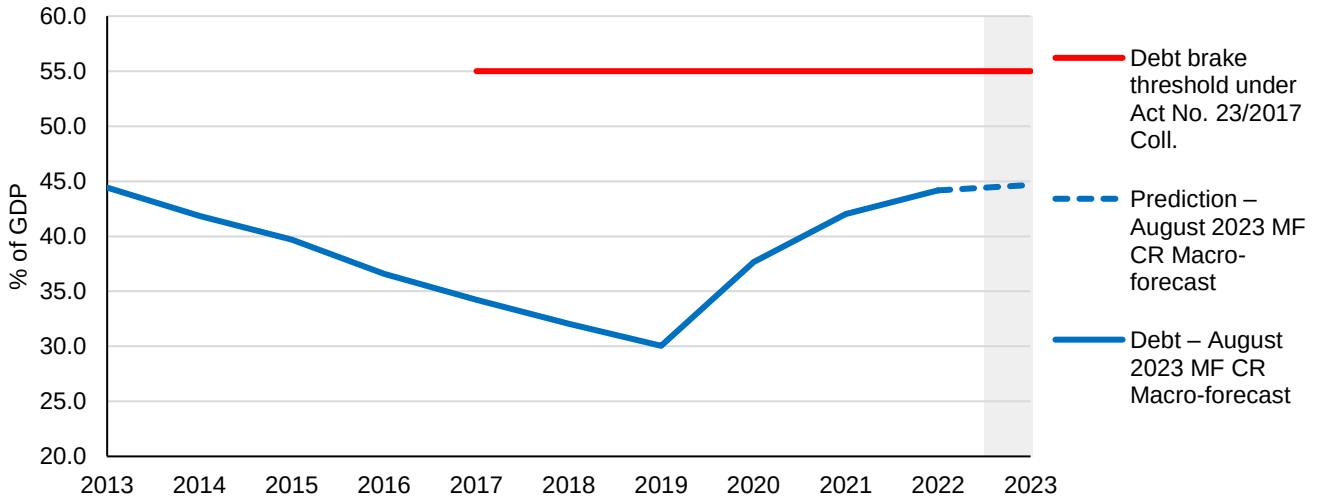
Chart 1.1.1 also shows the structural balance limit for the period 2024–2027. However, this is not a prediction of the value of the balance, but the maximum allowable limit set by the Act. The red dashed line shows the limit of the balance according to the current version of the Act.[12] The black dashed line indicates the lowest permissible value of the balance under the amendment to the Act proposed

[8] The wording of Section 10a of the Act is based on the second amendment to the Act (see Act 609/2020 Coll.).
[9] The 2020 amendments to the Act did not set a structural balance limit for 2021. Therefore, the 2021 threshold is not shown in Chart 1.1.1.
[10] MF CR (August 2023): Macroeconomic Forecast of the Czech Republic.
[11] See in detail https://www.mfcr.cz/cs/ministerstvo/media/tiskove-zpravy/2023/ministr-stanjura-hospodareni-statniho-rozpoctu-udr-52099 (available in Czech only) and MF CR (August 2023): Macroeconomic Forecast of the Czech Republic.
[12] The CFC believes that the lower balance limit of the original Act applies for 2023. According to the CFC, the second amendment to the 2020 Act (implemented by Act No 609/2020 Coll.) only modifies the structural balance limit for 2022 in Section 10a of the Act. For 2023, the original text of the Act should already be applied, i.e. the structural balance limit should be set at –1% of GDP. See Box 2.1 in the 2022 Long-term Sustainability Report.

as part of the consolidation package. This proposal sets explicit structural balance limits for 2024–2027 in the new text of Section 10a of the Act.

The deficit performance of the general government sector contributes, all other things being equal, to the increase in the debt of this sector. The debt-to-GDP ratio reached 44.2% of GDP in 2022 (Chart 1.1.2). The ratio increased by 2.1 pp y-o-y, despite a high nominal GDP growth of 11.1%, which is working towards a reduction (see also Box 1.1). The increase in the ratio was driven, among others, by the primary deficit (2.5% of GDP[13]) and interest payments (1.2% of GDP). The increase in interest payments in 2022, whose ratio to GDP increased by around 0.4 pp y-o-y, mirrors, in addition to the increase in debt, the increase in the required rate of return on government securities. At the end of 2021, the yield on the 10-year government bond was 2.62%; just one year later, it was already 4.71%.[14] Other factors[15] also increased the debt-to-GDP ratio in 2022, totalling 2.7% of GDP, most notably the net accumulation of financial assets. These include loans granted[16] and an increase in the public sector's claims on other entities outside the sector. However, lending was covered by borrowing. The increase in debt in nominal terms was CZK 430.4 billion, which is significantly higher than the 2022 outturn for the public sector (CZK –247.5 billion). The public sector thus borrowed CZK 182.9 billion more than its total balance.[17]

Chart 1.1.2 General government debt minus the state debt financing reserve



Source: MF CR (August 2023): the Macroeconomic Forecast of the Czech Republic; CFC calculations.

In addition to the level of debt, the structure of debt holdings is also important for the sustainability of public finances. In other words, it also depends on which entities buy and hold government debt securities (residents and non-residents). This perspective is important mainly because non-residents are more likely to sell Czech government bonds in case of increased risk aversion in financial markets.

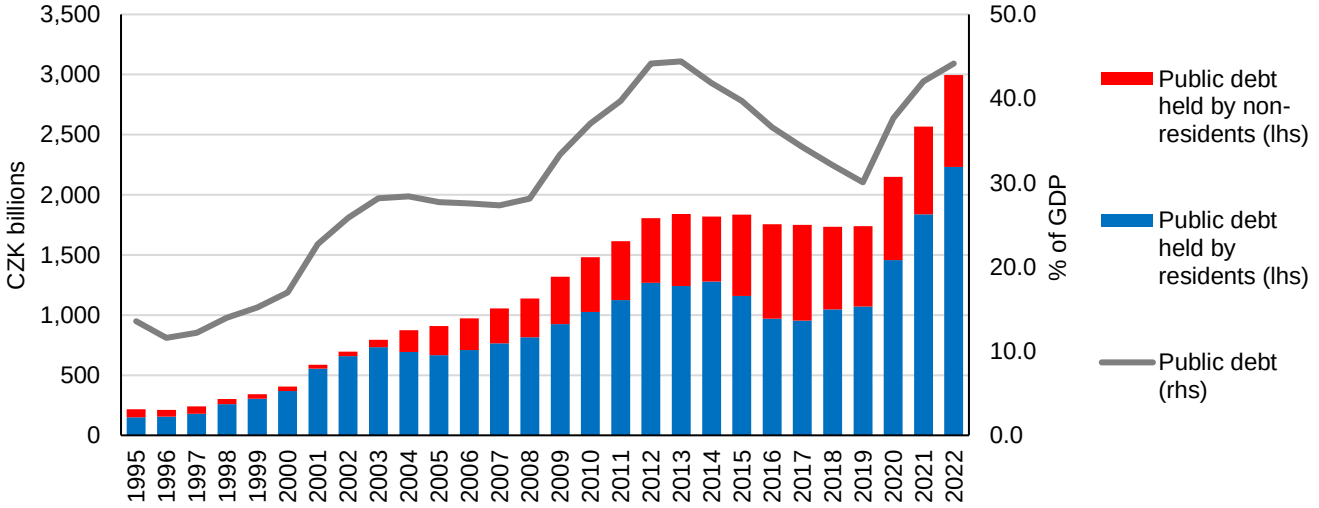
From 2020 onwards, we observe a significant increase in the share of public debt held by residents. While at the end of 2019, 61.6% of public debt was held by residents, this share rose to 67.7% in 2020, reached 71.6% in 2021 and was already 74.5% by the end of 2022.

From the perspective of assessing the riskiness of the public debt structure, a possible sell-off of domestic debt by foreign investors would probably

[13] The reported figures of the primary deficit are based on the general government balance published in the first CZSO notifications and confirmed by Eurostat (April 2023). Figures may be subject to inaccuracies due to rounding.
[14] ARAD - Time Series System - Czech National Bank (cnb.cz). The implicit interest rate on public sector debt according to the Convergence Programmes of the Czech Republic (see MF CR May 2022 and April 2023) reached 2.0% in 2021 and 2.7% in 2022
[15] This is the so-called SFA (stock-flow adjustment).
[16] In particular, the MF CR loan to ČEZ, a. s. in the amount of EUR 3 billion (see in detail https://smlouvy.gov.cz/smlouva/20982187?backlink=hh9gi (available in Czech only), ČEZ (2023): ČEZ Group - Annual Financial Report for 2022 (I. Report on Activities) and MF CR (April 2023): Macroeconomic Forecast of the Czech Republic).
[17] For more information, see, for example, https://www.czso.cz/csu/czso/ari/notification-of-government-deficit-and-debt-2021-first-notification-data-notified-by-eurostat. The amount of borrowing reflects the issuance of government securities. This issue, according to the MF CR, "*...is mainly due to the pre-financing of the state budget deficit, which was approved by the Chamber of Deputies of the Parliament of the Czech Republic on 18 October 2022 within the framework of the amendment to Act No. 57/2022 Coll., on the State Budget of the Czech Republic for 2022 in the amount of CZK 375.0 billion.*" (https://www.mfcr.cz/cs/verejny-sektor/rizeni-statniho-dluhu/publikace/dluhove-portfolio-ctvrtletni-informace/2022/ctvrtletni-zprava-o-rizeni-statniho-dluh-49071). See also: https://www.mfcr.cz/cs/verejny-sektor/rizeni-statniho-dluhu/publikace/zprava-o-rizeni-statniho-dluhu/2022/zprava-o-rizeni-statniho-dluhu-ceske-rep-50523/ (both available in Czech only).

trigger not only exchange rate movements but also increased volatility in the market prices of Czech government bonds. This risk of external shock spillovers to the domestic financial system was thus further reduced during 2022. In line with international practice, the Czech National Bank (CNB) considers the critical threshold for the share of public debt held by foreign entities to be 25.9%. This threshold has been exceeded for a long time, but in 2022 (for the first time since 2004) the debt held by non-residents fell below this threshold, reaching 25.5% at the end of 2022 (see Chart 1.1.3).

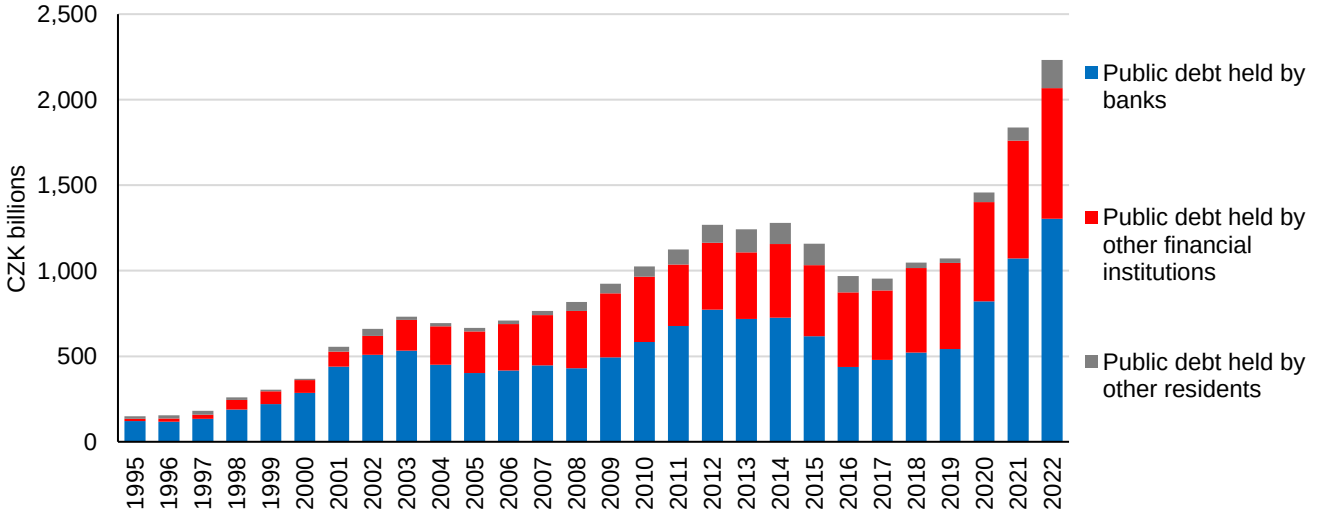
Chart 1.1.3 Public debt held by residents and non-residents



Source: CNB (2023) and MF CR (August 2023): Macroeconomic Forecast of the Czech Republic; CFC calculations.

By the end of 2022, financial institutions accounted for the dominant share of public debt held by domestic entities (residents), see Chart 1.1.4. The largest increase in public debt holdings (by CZK 232 billion) was again in the banking sector, which already held debt in excess of CZK 1 trillion in 2021. Other financial institutions (mainly insurance companies and pension funds) increased their holdings of Czech public debt by CZK 76 billion. Government bonds were thus likely to represent a suitable alternative liquidity allocation instrument in times of uncertainty, especially with rising government bond yields due to rising interest rates. The tax exemption of interest income on government bonds may also have been of some importance.[18]

Chart 1.1.4 Public debt held by residents



Source: CNB (2023); CFC calculations.

[18] Until 2020, non-residents' income from government bonds issued by the Czech Republic abroad was exempt from income tax. As of 2021, this exemption applies to all income from Czech government bonds.

Domestic banks held 43.5% of public debt at the end of 2022, up 1.7 pp from 2021 and 12.4 pp from 2019**.** The share of public debt held by banks in their assets was almost 14.6% at the end of 2022. Given the relatively high share of government bonds on banks' balance sheets, an escalation of sovereign risk would have significant implications for the financial system.

From the opposite perspective, problematic situations can also arise. The strong concentration of government bond holdings on the balance sheets of domestic banks raises the question of further absorption of government securities by these entities. According to the CNB[19], selected banks have set an internal volume limit on their exposure to central public institutions. If the banks reach this limit and reduce their purchases of government bonds, the scope for placing government bonds in the financial market by private sector entities will be reduced, which may also have implications towards a rise in the rate of return. In the context of the high financing needs of the public sector in the coming years, this situation may entail a tightening of the budgetary constraints on the public sector.

The average time to maturity of government debt has decreased to 6.2 years at the end of 2022 (the value in 2021 was 6.4 years). The decrease was mainly due to the issuance of bonds with shorter maturities in the second quarter of the year as a result of developments in Ukraine and its adverse impact on financial markets. Similar developments were also observed in other European countries that are members of the OECD.

Box 1.1 The impact of inflation on public budgets in the short and medium term

The rise of the inflationary wave not only in the Czech Republic has significant implications for both the revenue and expenditure sides of public budgets. The overall effect depends on the extent to which individual expenditure and revenue items are automatically indexed to the inflation rate or valorised with the inflation rate (or another nominal variable) as the key valorisation component. In the Czech Republic, until 2023, automatic indexation applied only to pension insurance benefits. From 2024, however, this principle will be extended to payments for state-insured persons in the public health insurance system. Together, these two items account for 36% of state budget expenditure (in 2023). In addition, from 2024, the principles of automatic indexation will also apply in the education sector (teachers' salaries in regional education) and in the defence sector (fulfilment of the allied commitment under the NATO defence pact). These two new indexations are not immediately caused by a period of high inflation. Nevertheless, once they are triggered, the four largest items of the state budget, which in 2024 are likely to total more than 50% of its total expenditure, will be indexed or automatically indexed. For three of them, the indexation or valorisation principle will be activated in a single budget year. Another item that is directly dependent on the inflation rate is the interest costs on part of the savings government bonds (so-called anti-inflationary bonds).

One of the unintended consequences of inflation on public finances is the growing political and social pressure to introduce indexation in new areas of public spending. These indexations consequently make it difficult to manage public finances and to preserve their sustainability in the future, as they are very difficult to abolish or reduce once they are introduced. In this respect, therefore, a low, stable and predictable inflation rate is as beneficial for public finances as it is for the economy as a whole.

On the revenue side, the impact of inflation is not straightforward. The main channel is value-added tax (VAT) revenue, where there is a clear relationship between price increases and tax revenue, given its construction as a share of final price. However, this may be distorted by the response of households to price increases in the form of a fall in real spending. The overall effect can therefore be expected to be smaller. For example, for 2023, the MF CR[20] expects household consumption expenditure in current prices to increase by only 5.9% at an average annual inflation rate of 10.9%. Moreover, the importance of VAT revenue in public budgets is lower than in the case of pension insurance benefits (CZK 588 billion vs. CZK 672 billion in 2023), so high inflation has clear negative effects on the economic balance in the short term.[21]

If inflation is accompanied by rapid nominal wage growth, the effective taxation of personal income will increase autonomously. The reason is that social allowances for personal income tax (per taxpayer, per child, etc.) are set in nominal terms and their real value is gradually declining.[22]

[19] CNB (June 2023): Financial Stability Report - Spring 2023.
[20] MF CR (August 2023): Macroeconomic Forecast of the Czech Republic.
[21] It should be noted here that the automatic indexation of payments for state-insured persons has neutral effects on the balance in terms of the overall public budgets. However, in the event of high inflation, the state budget deficit will widen while improving the balance of the health insurance companies.
[22] This effect is referred to in the literature as cold progression or "fiscal drag". It is accentuated when the boundaries between tax brackets are defined in nominal terms (which is not the case in the Czech Republic).

Of course, high inflation also affects other items on the expenditure side. However, here the effect is rather mediated. For example, rising prices can be expected to force increases in the minimum subsistence level, which will have implications for the growth of social transfer expenditure. Furthermore, price increases will also lead to an increase in the cost of intermediate consumption of the general government (e.g. energy expenditure), which will again have implications for the overall balance. Higher upward pressure on the wages of public sector employees can also be expected, as they will seek to prevent a decline in the real value of their earnings.[23]

In the medium term, the effects of inflation on public budgets are less clear. It depends on whether there is a change in the income structure of GDP. If the importance of operating surpluses increases at the expense of compensation of employees (which is the case in 2023), the resulting effect will be negative (because profits are taxed less than wages). If the reverse shift were to occur, the result would be an increase in the tax quota and therefore an improvement in the balance.

In the context of public finances, the impact of inflation on the debt ratio should also be mentioned. With high price growth, high nominal GDP growth can be expected, which will start to push the indicator down. However, it should be noted that the growth rate of nominal GDP is influenced by the GDP deflator and not directly by the consumer price index. However, its value has been lower in the last two years than in the case of conventional consumer inflation (2022: 8.5% vs. 15.1%, 2023: 9.0% vs. 10.9%), thus reducing the above-mentioned effect.

However, the effect of autonomous debt quota reduction generated by high nominal output growth may be overwhelmed by the response of government bond yields in the medium term. If the value of the required rate of return exceeds the nominal GDP growth rate, the opposite effect will occur.

1.2 Decomposition of the fiscal effort

The fiscal effort represents the change in the structural balance between two periods. If it is negative, fiscal policy is eased, if positive, it is tightened. The three main factors influencing the level of fiscal effort are: autonomous developments (e.g. a higher share of wages and salaries in GDP will lead to higher revenues for the general government sector due to higher taxation of the factor of production of labour compared to capital), discretionary actions of the government (deliberate measures by the government) and factors depending on other determinants (e.g. investment activity of municipalities depends in part on the implementation of various operational programmes).

Table 1.2.1 shows the decomposition of the fiscal effort over the period 2017–2023. The decomposition is carried out using the so-called indirect method, i.e. as the year-on-year change in the structural balance followed by a decomposition. In 2022, the fiscal effort reaches 0.5 pp,[24] hence there is a tightening of fiscal policy. Box 1.2 provides a comparison of the planned fiscal consolidation with the EU27.

Significant discretionary measures of the government affecting the structural balance in 2022 included, among others, an increase in the basic taxpayer credit, which reduced the personal income tax revenue by CZK 12.3 billion. The corporate income tax (CIT) yield was reduced due to a change in the method of creation and tax deductibility of technical provisions of insurance companies and tax exemption of government bond proceeds. On the other hand, the increase in public revenue in the area of CIT was brought about by the end of the application of the increased entry price threshold for depreciation of tangible assets. Overall, these changes led to a decrease in CIT collections of CZK 5.2 billion. In the area of social benefits in cash, pension expenditure increased by CZK 55.9 billion due to the January statutory indexation and the extraordinary indexations in June and September (see Box 3.1 for details). Within capital transfers, payments to the Czech Post (universal service costs for the period 2018–2022) amounted to CZK 7.5 billion.[25]

Table 1.2.1 shows the significant impact of one-off and temporary measures. These measures do not affect the structural balance of the general government sector, but they do affect the overall balance and may also stimulate aggregate demand with possible inflationary effects. In particular, in the period 2020–2021, the measures were predominantly aimed at reducing the negative effects of the COVID-19 pandemic. In 2022, there

[23] The extent to which this will occur depends strongly on the labour market situation and wage dynamics in the private sector.
[24] The fiscal effort for 2022 and 2023 is based on a different basis than the MF CR (August 2023): The Macroeconomic Forecast for the Czech Republic. The table 1.2.1 uses revenue and expenditure data from the first notifications in April 2023, i.e. the increase in corporate income tax revenue in 2022, which was not known at the time of the first notifications, is not taken into account. Actual CZSO data confirmed by Eurostat will bring second notifications in October 2023.
[25] These items are captured by the following legal provisions: act No 364/2019 Coll., 609/2020 Coll., 323/2021 Coll.; Government Decree No 35/2022 Coll., 36/2022 Coll., 136/2022 Coll., 137/2022 Coll.; Commission Decision (EU) 2023/232 of 25 July 2022 on State aid SA.55208 (2020/C) (ex 2022/NN).

was a strong decline in the one-off and temporary measures that were associated with the pandemic, with only the continued possibility of extraordinary depreciation and the compensatory bonus being fiscally more significant. In contrast, the two main areas where the government took these steps gained importance in 2022. These were support to households and businesses affected by high prices of food, energy and other items. In addition, the government provided humanitarian benefits and other expenses related to the war conflict between the Russian Federation and Ukraine. On the public revenue side, this included a reduction in fuel excise duty (CZK 6.7 billion), a waiver of fees for renewable energy sources (CZK 4.6 billion) and a levy on excess revenues of electricity producers (CZK 1.4 billion). On the public expenditure side, the provision of humanitarian benefits for refugees (CZK 8.7 billion), the introduction of a savings tariff for electricity and gas for households (CZK 17.4 billion), support for energy-intensive businesses (CZK 5.5 billion) and a one-off child allowance (CZK 6.7 billion) affected public spending.[26]

Table 1.2.1 Decomposition of the fiscal effort (pp)

	2017	2018	2019	2020	2021	2022	2023
Taxes and social contributions	*-0.6*	*0.3*	*-0.4*	*2.2*	*-0.9*	*-1.2*	*-0.3*
Other revenue	*-0.3*	*0.4*	*-0.1*	*0.1*	*0.0*	*0.6*	*0.7*
*in which one-off revenue-side measures**	*0.0*	*-0.1*	*0.0*	*-0.7*	*0.5*	*0.0*	*0.3*
REVENUE	-0.9	0.8	-0.5	3.0	-1.4	-0.6	0.1
Compensation of employees and intermediate consumption	*0.0*	*-0.8*	*-0.2*	*-1.4*	*0.3*	*1.0*	*0.3*
Social transfers and social transfers in kind	*0.5*	*0.1*	*-0.2*	*-2.7*	*0.3*	*0.5*	*-0.3*
Interest	*0.2*	*0.0*	*0.0*	*-0.1*	*0.0*	*-0.4*	*-0.1*
Investment	*-0.1*	*-0.8*	*-0.2*	*-0.5*	*0.1*	*0.1*	*-0.2*
Other expenditures	*0.2*	*-0.1*	*0.0*	*-1.6*	*0.0*	*0.8*	*0.3*
*in which one-off expenditure-side measures**	*0.1*	*0.0*	*0.1*	*-1.6*	*0.2*	*0.8*	*-0.7*
EXPENDITURE	0.7	-1.6	-0.5	-4.5	0.5	1.1	0.7
FISCAL EFFORT	-0.2	-0.8	-1.0	-1.5	-0.8	0.5	0.8

Source: the CZSO (2023), the MF (2018, 2019, 2021, 2022, 2023): the Convergence Programme of the Czech Republic, the MF CR (August 2023): the Macroeconomic Forecast of the Czech Republic; CFC calculations.
Note: Taxes and social contributions have been cyclically adjusted, other items have not. Cyclical component of the balance taken from the MF CR (August 2023) Macroeconomic Forecast of the Czech Republic. One-off operations on the revenue and expenditure side are from the Convergence Programmes of the Czech Republic. Data for 2023 from the MF CR (August 2023): Macroeconomic Forecast of the Czech Republic. Positive values imply a tightening of fiscal policy. Totals in the table may be subject to inaccuracies due to rounding. *One-off operations on the revenue and expenditure side are already included in the previous revenue and expenditure items and therefore enter the calculation with the opposite sign.

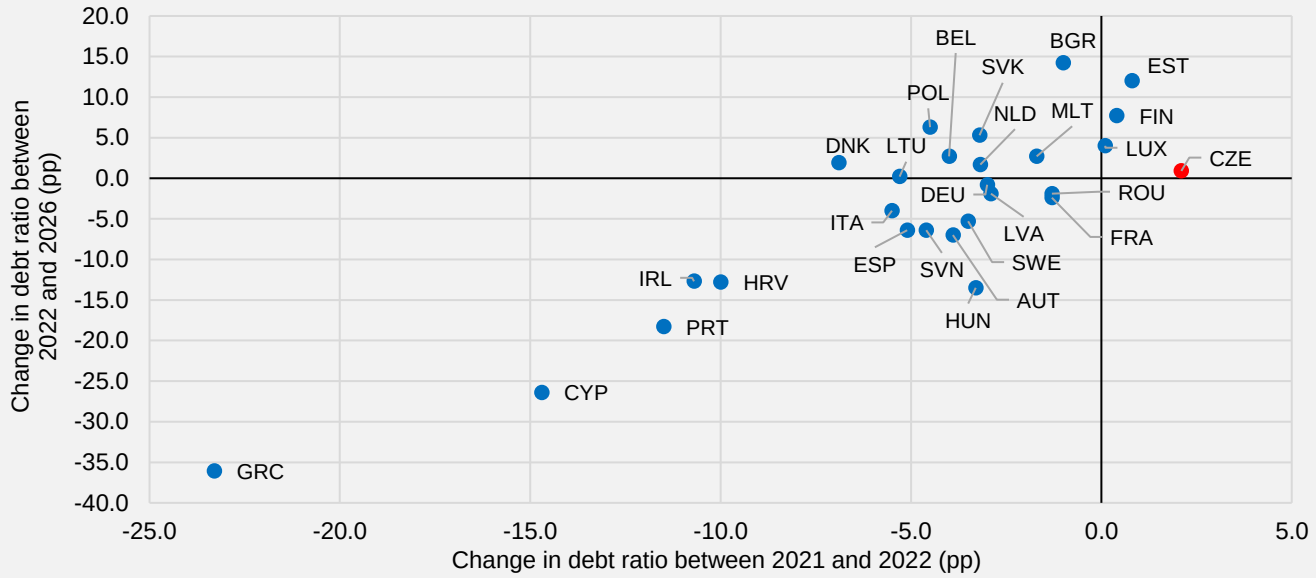
Box 1.2 Comparison of the pace of planned fiscal consolidation in EU countries

In recent years, the public finances of the Czech Republic and other EU countries have been under considerable pressure as a result of the COVID-19 pandemic and the refugee and energy crises triggered by Russia's aggression against Ukraine. This has resulted in high deficits and an increase in public sector debt. It is therefore necessary to stabilise the economic situation and to proceed to fiscal consolidation in the coming years.

The following charts are based on the Stability and Convergence Programmes drawn up by EU countries in line with the Stability and Growth Pact. The projections in the programmes should include stand-alone scenarios (so-called no-policy change), incorporating those measures that are known in sufficient detail and committed to by governments. Chart B1.2.1 shows that while most EU countries reduced their debt levels between 2021 and 2022 (*x-axis),* only four countries experienced an increase in debt-to-GDP ratio between 2021 and 2022, namely Luxembourg, Finland, Estonia and the Czech Republic.

[26] These items are captured by the following legislation: Act No. 609/2020 Coll., 519/2021 Coll., 66/2022 Coll., 131/2022 Coll., 176/2022 Coll., 196/2022 Coll., 198/2022 Coll., 262/2022 Coll., 365/2022 Coll., 366/2022 Coll.; Government Resolution No. 786/2022, 876/2022 Coll.

Chart B1.2.1 Comparison of the change in the debt-to-GDP ratio in EU countries

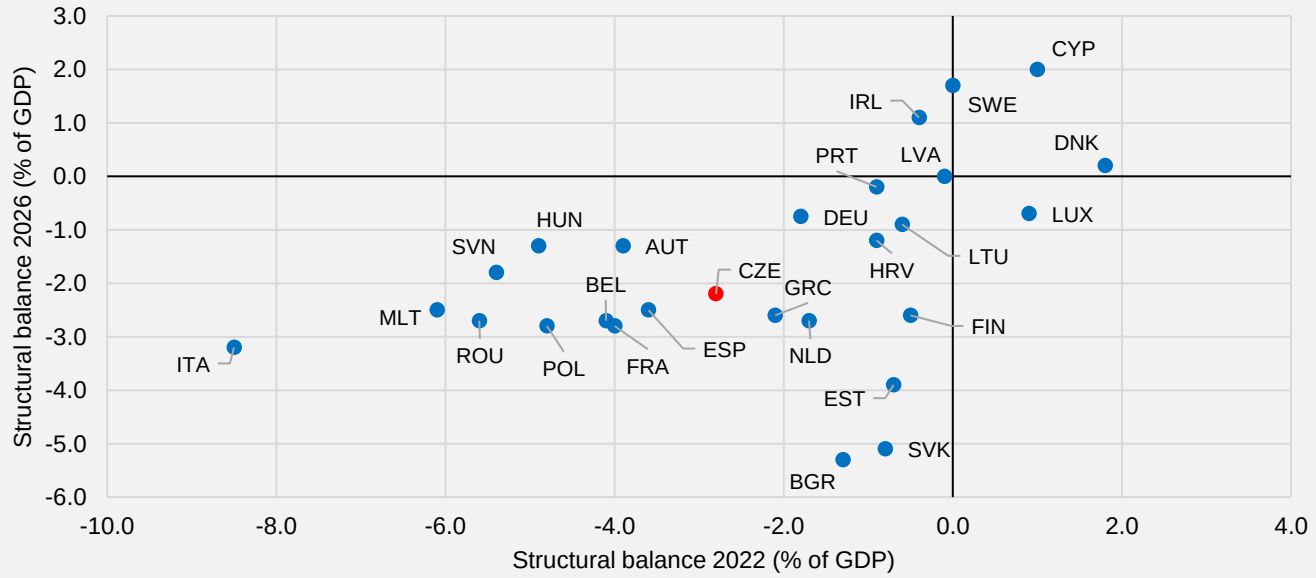


Source: Eurostat (2023), Convergence and Stabilisation Programmes (2023); CFC calculations.

The Czech Republic was the economy with the highest increase in the debt-to-GDP ratio in the EU between 2021 and 2022. Between 2022 and 2026 (*y-axis* of Chart B1.2.1), further deleveraging is projected for a number of countries. In particular, the highest deleveraging is projected in this medium-term horizon for highly indebted countries (Greece, Cyprus and Portugal), which are likely to respond to fiscal rules in their programmes. In contrast, countries with relatively low debt levels such as Bulgaria and Estonia, but also countries such as Poland, Slovenia and Finland, are among those with elevated debt levels in the period 2022–2026. In its programme, the Czech Republic expects a slight increase in debt levels in the coming years, by 0.9 pp at the end of the period under review (2026) compared to 2022.

The following Chart B1.2.2 compares the structural balance (i.e. the general government balance adjusted for the business cycle and one-off and temporary measures) in 2022 and at the end of the reference period (2026). Only four EU countries do not have a negative structural balance in 2022 (Denmark, Cyprus, Luxembourg and Sweden). The other countries have structural deficits in 2022. In the Czech Republic, the structural balance was –2.8% of GDP, but the fiscal effort was positive in the same year as expenditure growth was slower than revenue growth.

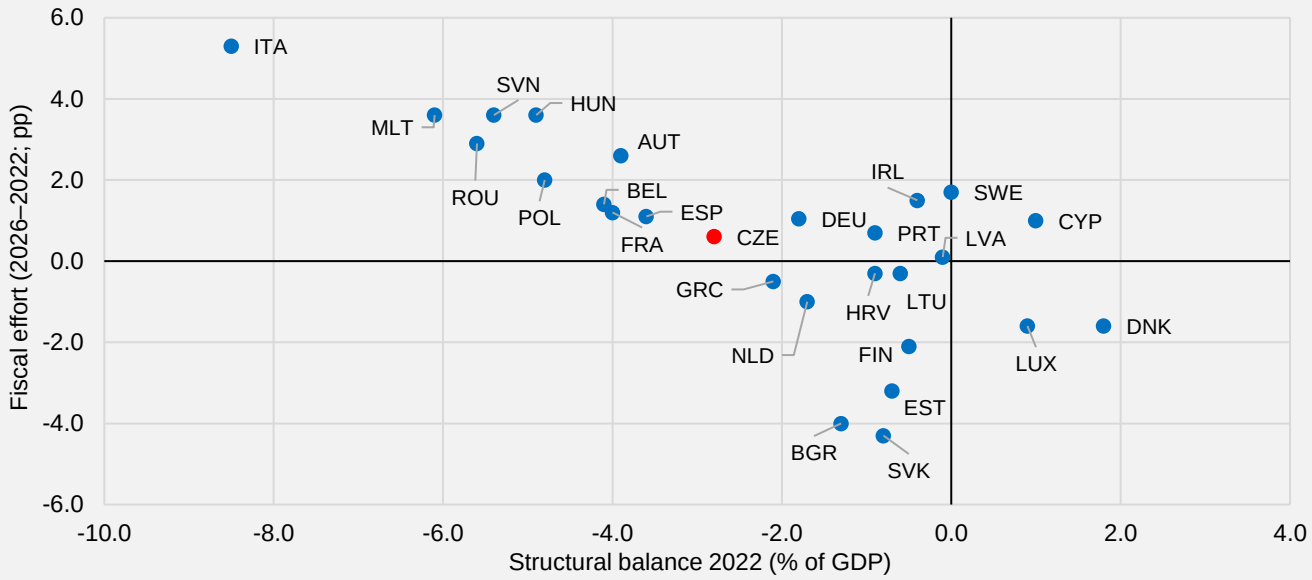
Chart B1.2.2 Comparison of structural balances in EU countries



Source: Convergence and Stabilisation Programmes (2023); CFC calculations.

At the end of the period under review (2026), structural deficits are still projected for most countries, but they are decreasing, which is also reflected in Chart B1.2.3 showing the fiscal effort (difference between the structural balance in 2026 and 2022). The Czech Republic's structural balance also improves by 0.6 pp over the whole period to –2.2% of GDP in 2026 compared to 2022. The fiscal effort can thus be described as roughly average compared to other EU countries. However, it is important to add that the April 2023 Convergence Programme does not include fiscal consolidation in the form of a so-called consolidation package, which should further reduce the structural deficit.

Chart B1.2.3 Comparison of the structural balance in 2022 and the fiscal effort between 2026 and 2022



Source: Convergence and Stabilisation Programmes (2023); CFC calculations.

2 Long-term macroeconomic projection

We base our long-term projection of public sector expenditure, revenue and balance over a 50-year time horizon on a projection of the underlying relevant macroeconomic variables. The most important of these are the GDP growth rate, employment, labour productivity and the volume of wages. They also determine the distribution of gross value added between the factors of production, labour and capital.[27] We relate our fiscal projection to GDP and other variables in real terms. In contrast to the previous first chapter, in the long-run projection we disregard the business cycle. Thus, the estimated evolution of the economy is a simulation of the evolution of potential GDP and other macroeconomic indicators corresponding to it. In 2020 and 2021, the direct and indirect effects of the COVID-19 pandemic and the measures taken to counter the spread of the disease will be fully felt in the economy, translating into a decline in GDP and potential output. Then in 2022, the invasion of Ukraine by the Russian Federation occurred, which led, among other things, to an increase in energy and food prices. This price increase then implied a negative supply shock that dampened the post-covid recovery.

The overall negative economic shock was so significant that it affected not only the cyclical position of the economy but also the estimates of current and past potential output in the Czech Republic and abroad. Uncertainty about the starting point of our projections remains relatively high, as the estimate of potential output may be revised back in the future.

2.1 Real convergence

As in previous years, our long-term macroeconomic projections are based on neoclassical growth theory. Given the volume of inputs (e.g. capital, labour, technology), we assume that the Czech economy is and will be a converging economy. We continue to consider the convergence target of the Czech economy to be the economy of Austria, which, like the Czech Republic, is a standard mixed economy of an EU member state with a similar size and structure.

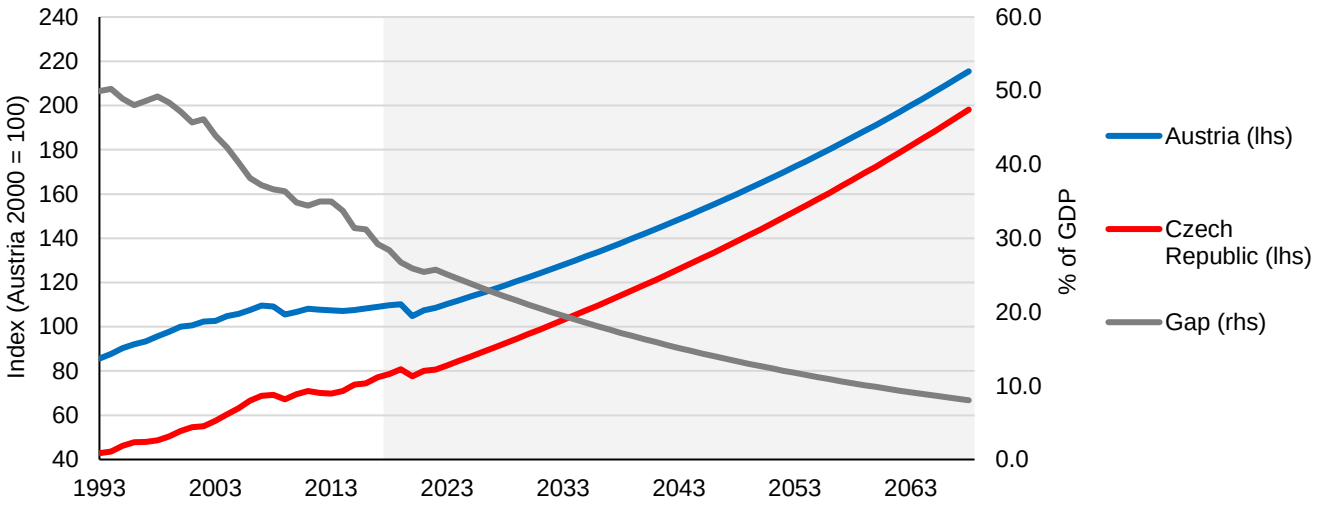
We model the convergence process as convergence of GDP per worker, i.e. convergence of national labour productivity. We assume that each year the difference in labour productivity between the Czech Republic and Austria shrinks by a constant percentage. Thus, the gap between Austrian and Czech GDP per worker, which in PPP terms was estimated at 25.7% of the Austrian level in 2022[28], will narrow by about 2.3% per year on average. This rate is consistent with the rate of convergence over the last 20 years and is in line with the usual empirical results on convergence (see Chart 2.1.1). [29]

In addition to the convergence component of labour productivity growth, we also assume continued autonomous technology growth (the growth rate of aggregate factor productivity) of 1.5% per year, which corresponds to the long-term average for advanced countries when the effects of the financial crisis of 2008 and 2009 and the COVID-19 pandemic of 2020 and 2021 are eliminated. This technology growth is symmetrically reflected in the growth of the Austrian and Czech economies. When estimating the long-term growth of the Czech economy, it should be added to the convergence component of growth.

GDP growth rates per worker thus fall in our simulation from 2.4% in 2023 to 1.7% at the end of the projection due to the gradual depletion of the convergence component of growth. With the given parameter settings, this means that national labour productivity could be at 93% of the future Austrian level in 2073. From the convergence of labour productivity and the projected evolution of the number of workers, which depends mainly on demographic developments, we then generate a projection of total GDP.

[27] A more detailed explanation of the procedure and the parameters used for the long-term macroeconomic projection is given in OCFC (2019): Dlouhodobá makroekonomická projekce ČR [Long-Term Macroeconomic Projections of the Czech Republic, available in Czech only].
[28] According to OECD statistics (2023), potential output growth in Austria was higher than in the Czech Republic in 2022, so convergence in output per worker stopped in the short term and the gap between Austrian and Czech GDP even increased by 0.3 pp. In the projection, we assume that the convergence process will resume from 2023 onwards.
[29] For details, see again the study published by the OCFC (2019): Dlouhodobá makroekonomická projekce ČR [Long-Term Macroeconomic Projections of the Czech Republic, available in Czech only].

Chart 2.1.1 Convergence of output per worker to the Austrian level



Source: OECD (2023); CFC calculations.

2.2 Demographic projection

Demographic projection is a key parameter for the long-term sustainability of public finances. It significantly affects both the expenditure side of public budgets, such as pensions, health care, education and social benefits, and the revenue side. Demographic projections are also one of the basic inputs for macroeconomic projections and intergenerational accounts. It is used to simulate the evolution of the workforce, which is influenced by both the projected population and the age structure of the population.

The long-term projection of demographic development is based on the demographic projection of the Czech Statistical Office (CZSO) published in November 2018, which is prepared in four variants – medium, high, low and medium demographic variant without migration (i.e. with zero net migration for each year of the projection).

Table 2.2.1 Materialisation of the CZSO's demographic projection in 2020–2022 (‰)

	2020 and 2021 (average)			2022		
	projection	reality	difference	projection	reality	difference
Net migration (first variant)*	2.433	3.638	1.204	2.426	3.520	1.094
Net migration (second variant)				2.426	30.647	28.220
Natural growth	-0.437	-2.230	-1.793	-0.796	-1.893	-1.098
gross mortality rate	*10.543*	*12.702*	*2.160*	*10.598*	*11.173*	*0.575*
gross birth rate	*10.106*	*10.473*	*0.367*	*9.802*	*9.415*	*-0.388*
GROSS OVERALL GROWTH RATE	1.996	1.408	-0.588	1.630	28.753	27.123

Source: CZSO (2023); CFC calculations.
Note: *Net migration shown in two variants. In the first variant, the net migration is given according to the publication of the Czech Statistical Office (2023): Stav a pohyb obyvatelstva v ČR – rok 2022 [The State and Movement of the Population in the Czech Republic – Year 2022, available in Czech only]. In this publication, persons who were granted temporary protection in connection with the armed conflict in Ukraine (i.e. the "normal" net migration) were not included. The second option includes this migration wave. .

For the baseline scenario of our projections, we chose the medium, i.e. the most likely variant of the demographic projection as the starting point. According to the other variants, we then worked out alternative scenarios of development.

As in previous years, we have updated the official demographic projection of the CZSO with new data. First, we replaced the age structure of the population for 2019 to 2023[30] with the observed reality. We then used the assumed fertility, mortality and migration

[30] Data as of 1 January of the year.

rates for 2023–2100, which we took from the 2018 CZSO projection, with the exception of the migration rate form 2023–2033 (see Box 2.1), to generate new projected population trends, including its age structure, for each variant of the demographic projection.

The CZSO's demographic projection is based on the reality of the Czech Republic at the beginning of 2018. However, the actual development during 2018 to 2022 differed from this projection, which is discussed in more detail in Box 2.1 and Table 2.2.1. It was already slightly higher in 2018 and 2019, then increased significantly in 2020 and 2021 due to the COVID-19 pandemic. In 2022, the mortality rate remained above projection despite its decline. Overall, then, the number of deaths for 2018 to 2022 was 9.4% higher than projected (i.e. 0.5% of the 2018 population). The birth rate changed in the opposite direction in 2022, being lower than the CZSO projection. In contrast, the number of births in 2018–2021 was 2% higher than projected. Thus, the decline in the 2022 birth rate can be interpreted as primarily a reverse swing against the relatively higher birth rates in previous years, which most likely reflected pandemic lockdown. Thus, there was a partial depletion of the 'fertility reservoir'. The most significant shock in 2022, however, was a significantly positive net migration. Here, we must distinguish between "normal" migration and migration caused by the war in Ukraine[31], which meant an increase in the total population of the Czech Republic by about 300,000 people. However, even normal migration was noticeably higher than predicted, pushing the trend growth of the total population back to the assumption of the CZSO projection. Overall, population growth in 2022 was 2.7% higher than the projection.

Using demographic projections, we estimated workforce growth as the population aged 21 years and older less projections for the number of old-age pensioners and level 3 disability pensioners. We estimate the number of recipients of these pensions primarily based on the statutory retirement age.[32] In the projection of the number of workers, we assume a stable economic activity rate for individual age groups and a constant natural rate of unemployment. By linking the growth (or decline) rate of the labour force to the projection of GDP per worker, we obtain the growth trajectory of total GDP, from which we derive the growth rate of GDP per capita (see Table 2.3.1).

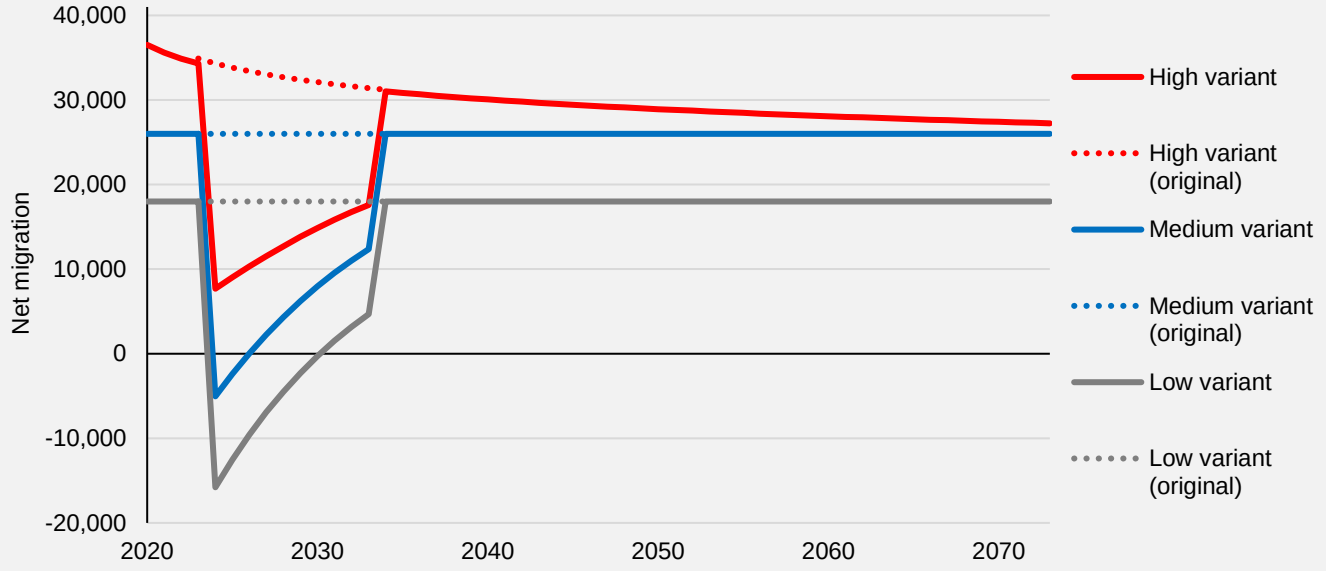
Box 2.1 Adjustments to demographic projections

In the box we present in more detail the adjustments made in the demographic projection that affected the total population. As in previous years, we have based our projections on the adjusted demographic projection of the Czech Statistical Office, which has added updated data on the structure of the population in 2022, which now also includes persons with valid temporary protection in the Czech Republic in connection with the armed conflict in Ukraine who have applied for its extension by the end of March 2023. This number of registered refugees can be estimated at approximately 300,000 persons.[33] Other assumptions on mortality, fertility and migration have remained unchanged and are based on the latest demographic projection of the CZSO (i.e. from the end of 2018).

The adjustment is based on the assumption of a gradual return of refugees to Ukraine over the next few years (2024–2033). The medium variant of our projection reflects the Eurostat[34] assumption of a 67% share of refugees returning to Ukraine gradually over a 10-year period.[35] We set this share at 70% for the low variant and 60% for the high variant. From 2034 onwards, the net migration will return to its original level according to the CZSO (2018) methodology, see Chart B2.1.1.

[31] The population of the Czech Republic now includes persons who have been granted temporary protection in connection with the armed conflict in Ukraine and who have applied for an extension of this protection until 31 March 2023. This migration wave will also be reflected in the new demographic projection of the CZSO. However, in the CZSO publication (2023): Stav a pohyb obyvatelstva v ČR – rok 2022 [The State and Movement of the Population in the Czech Republic – year 2022, available in Czech only], which was published on 21 March 2023, these persons were not counted, which makes it possible to distinguish, at least partially, between "regular" and "refugee" migration.
[32] The methodology and projection of the number of beneficiaries of pension benefits is described in more detail in subsection 3.1.
[33] See CZSO (2023): Pohyb obyvatelstva – rok 2022 [Population Movement – 2022, available in Czech only]; specifically Table 2, according to which the number of persons with valid temporary protection in the Czech Republic in connection with the armed conflict in Ukraine as of 31 December 2022 totalled 306,072 persons (estimate of the number of persons residing in the Czech Republic; in response to requests for extension to 31 March 2023, this estimate was slightly adjusted downwards).
[34] Source: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_projections_in_the_EU_-_methodology#Assumptions_for_migration.
[35] Eurostat assumes that the return of refugees will be spread evenly over a period of 10 years. At the same time, it assumes a relatively larger migration wave (around 500,000 people), which will continue in 2023 in addition to 2022.

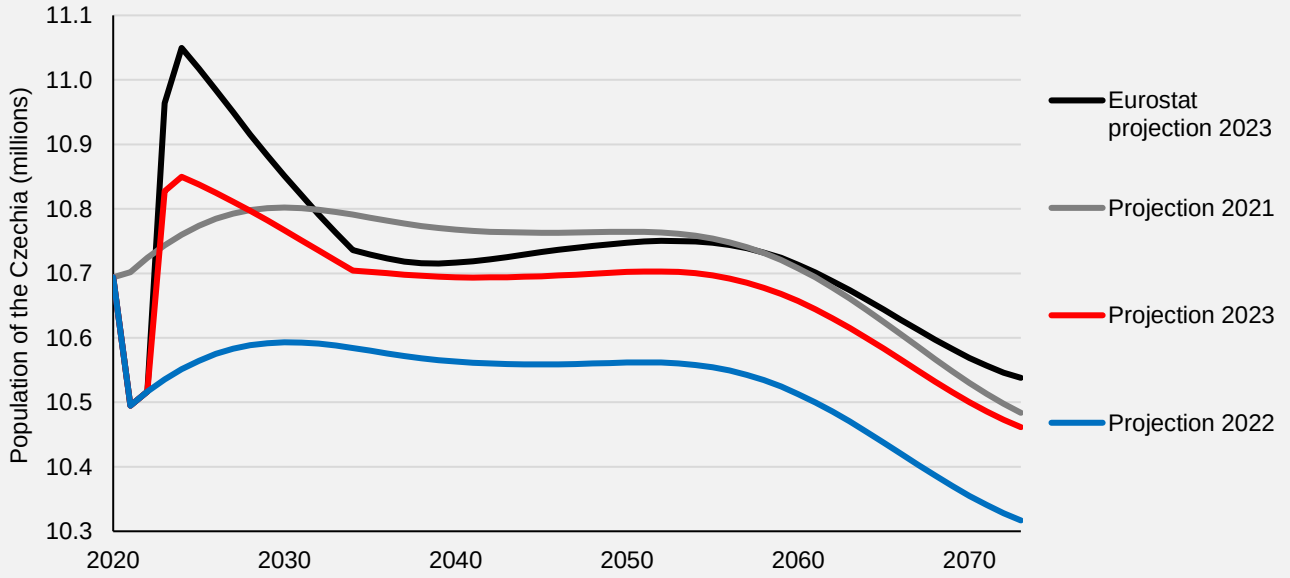
Chart B2.1.1 Net migration in 2020–2073 as projected by the CFC



Source: 2018 Population Projections of the Czech Republic 2018–2100, CZSO (2023); CFC calculations.
Note: Net migration is projected according to the CZSO (2018). For example, the chart does not include the reality of 2022.

An important difference from the Eurostat (2023) demographic projection is the total number of refugees included in the population of the Czech Republic. While Eurostat (2023) includes all persons with temporary protection in the Czech Republic, the CFC projection has adjusted this figure for those whose protection has expired and who have not renewed it by the end of March 2023. Due to the same assumption about the return of refugees to Ukraine described above, this initial difference decreases significantly by 2034.

Chart B2.1.2 Projected population in 2020–2073

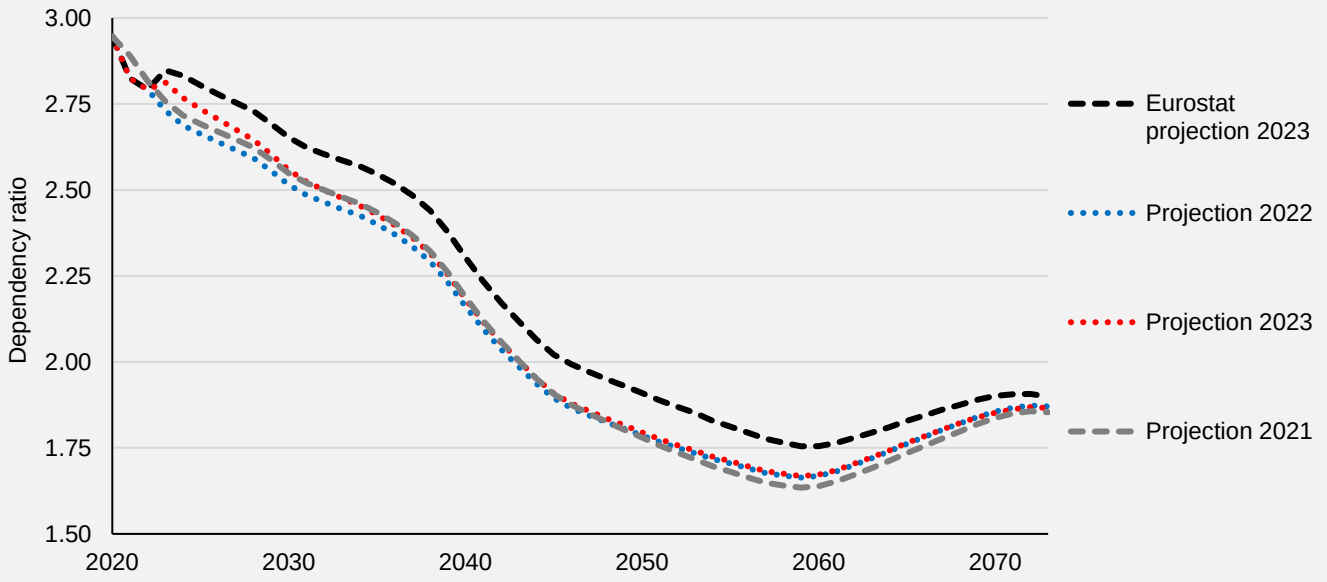


Source: 2018 Population Projections of the Czech Republic 2018-2100, CZSO (2023), Eurostat (2023); CFC calculations.

While the total population in both projections converges significantly over time (Chart B2.1.2), the population structure is different. As a significant proportion of refugees are women of childbearing age 15–49, namely 114,949 women (i.e. approximately 39% of all refugees), the initial difference between the two projections implicitly assumes a higher fertility rate compared to our projection, resulting in a relatively lower dependency ratio[36] in the later years of the projection compared to the Eurostat projection (2023), see Chart B2.1.3.

[36] The dependency ratio is a ratio defined as the number of people aged 21–64 years per person aged 65 years and over.

Chart B2.1.3 Projected dependency ratio in 2020–2073



Source: 2018 Population Projections of the Czech Republic 2018–2100, CZSO (2023), Eurostat (2023); CFC calculations.

The above adjustments to the demographic projection are largely technical changes, but the new demographic projection to be published in November 2023 will nevertheless provide a comprehensive assessment of demographic trends in the future. The projection used in this Long-term Sustainability Report thus entails the risk that the official CZSO demographic projection will be different. Areas where these risks may manifest themselves include, in particular, assumptions about the rate of out-migration of refugee with implications for the projected migration rate, assumptions about the outlook for the 'normal' migration rate, or assumptions about how the increased mortality rate during the COVID-19 pandemic will be reflected in long-term projections of mortality rates.

2.3 Real wages and the primary income distribution

Wage growth play a significant role in projections for the pension system, education, health care and other areas. In our projections, we derive real wage developments primarily from long-term labour productivity projections (or GDP per worker growth, see subsection 2.1). However, we supplement this convergence effect of real wage growth with the effect of the growth in the share of compensation of workers in gross value added (GVA).[37] This share was – and to a large extent still is – relatively low in the Czech economy compared to other countries. In the projection, we continue to assume a continued convergence of the workers' compensation share of GVA at the same rate as GDP per worker. This means that the gap between the share of workers' compensation in GVA in selected advanced countries and the corresponding share in the Czech Republic is projected to narrow by 2.3% per year.[38]

As a result of the increasing share of compensation of workers (and thus employees) in GVA, real wages grow faster than labour productivity in our projection. Similarly, the volume of wages and salaries grows faster than GDP in the long run, at the expense of firms' gross operating surplus (profitability). The distribution of GVA is important, among other things, for the level and structure of future tax and insurance revenues of the public sector. Real wage dynamics are also affected by the assumption of the initial share of compensation of workers in GVA. If this share were higher, subsequent wage growth would be slower. Between 2015 and 2020, the share of compensation of workers in GVA rises relatively rapidly (by around 5 pp over five years), but this is corrected in the period of high inflation in 2021 and 2022, when real wages fall quite sharply, and the share of compensation of workers in GVA falls (by 1.9 pp over two years). In our projection, we consider the 2022 baseline workers' compensation share of GVA to be in equilibrium. Overall, we thus assume that real wages will grow at an average annual rate of 2.1% (see Table 2.3.1), which is about 0.2 pp

[37] For the sake of better international comparability, we work with the share of compensation of workers, which we define analogously to compensation of employees, but with the difference that we also include an estimate of compensation of entrepreneurs (self-employed workers) at the same rate per self-employed worker as the average rate per employee.
[38] The selected developed countries here are Austria, Germany, Sweden, Denmark, Belgium, the Netherlands, Finland. For details, see the study published by OCFC (2019): Dlouhodobá makroekonomická projekce ČR [Long-Term Macroeconomic Projections of the Czech Republic, available in Czech only].

higher than the rate at which GDP per worker will grow.

The projection also includes an assumption on the inflation rate, assuming consumer price growth in line with the GDP deflator growth rate of 2% per annum. This rate of price level growth is in line with the CNB's current inflation target. Although this inflation target was significantly exceeded in 2022 (with significant implications for public finances), we expect the situation to normalise in the following years and inflation to return rapidly to the inflation target.

Table 2.3.1 Average annual growth rates based on the long-term projection (%)

	2023–2033	2034–2043	2044–2053	2054–2063	2064–2073	Entire period
GDP per capita	2.3	1.4	1.4	1.8	2.0	1.8
GDP per worker	2.2	2.0	1.9	1.8	1.7	1.9
GDP total	2.2	1.4	1.4	1.7	1.8	1.7
Average real wage	2.5	2.2	2.0	1.9	1.8	2.1

Source: CZSO (2023), OECD (2023); CFC calculations.

3 Expenditure and revenue in the long-term projection

The macroeconomic and demographic projections from the previous chapter form the basis for the projection of public sector expenditure and revenue presented in this chapter. The projection of general government expenditure and revenue is calculated assuming unchanged revenue and expenditure policy settings. The projections are therefore not a forecast in the sense that we assume that the simulations of revenue and expenditure presented are the most likely forecasts of actual developments. The results of these projections should be interpreted in this way – they are all conditional on the current policy settings and are designed to answer the question of what would happen if the current revenue and expenditure policy settings were unchanged.

The baseline projection scenario does not yet reflect the government's expected austerity measures (the so-called consolidation package), which should affect both the revenue and expenditure sides of the budget. Also not reflected are changes to the pension system settings (e.g. adjustments to early pensions, changes to the indexation mechanism), which are currently in the legislative process. The selected measures are reflected in the alternative scenarios presented in subsections 5.1–5.4.

Some expenditures are directly affected by demographic changes, while others are influenced by the long-term growth of the Czech economy and its convergence to the level of developed countries, both in terms of GDP per capita and labour productivity and real wages. Demographic and convergence effects are intertwined. Demographic influences prevail in the areas of pensions, health care, social benefits and long-term care. Convergence effects are more pronounced in the case of public investment spending, public employees' salaries or revenues from taxes and social security contributions.

3.1 Pension system

The pension system includes old-age pensions, disability pensions and survivors' (widows', widowers' and orphans') pensions. The system is managed and administered by the Czech Social Security Administration (CSSA), with the exception of pensions for the armed forces, for which the system is administered by the relevant ministries (in particular the Ministries of the Interior, the Ministry of Defence and the Ministry of Justice). However, the conditions for the payment of pensions for the armed forces are the same as those for insured persons under the CSSA[39], so we treat the whole pension system as a single entity in the projection.

The pension system as a whole has been significantly affected by a jump in prices and several waves of statutory and extraordinary pension indexation in 2022. In the projection of the expenditure side of the pension system, we will always first model the number of beneficiaries of each type of pension and then the amount of these pensions. The income side of the system is modelled directly in relation to our macroeconomic projection. By their very nature, pension contributions are de facto taxes on labour factor income.

3.1.1 Old-age pensions

Old-age pensions are the most important component of the pension system in quantitative terms. Nearly 2.4 million people currently receive them. The number of old-age pensioners fell by 55,500 between the end of 2019 and the end of the first quarter of 2023 (i.e. by about 2.3%), partly due to the increased mortality of the elderly caused by the COVID-19 pandemic and partly due to the continued extension of the statutory retirement age (by an average of two months for men and six months for women in 2022).

The number of old-age pensioners will continue to be dominated in the future by demographic developments and changes in the legal retirement age.

The retirement age is increased differently for men and women in accordance with an addendum to Act No. 155/1995 Coll., on Pension Insurance, as amended (the Pension Insurance Act). In 2030, the retirement age for men and women should be the

[39] In this Long-Term Sustainability Report, we have slightly modified the way we calculate pension expenditure for members of the armed forces compared to previous Long-Term Sustainability Reports. In the past, we have assumed a constant share of armed forces pension expenditure in GDP of 0.2%, which is consistent with the average over the last 15 years or so. The share of armed forces pension expenditure in GDP and the share of pension expenditure paid by the CSSA in GDP show very similar trends (correlation coefficient of 0.845), with armed forces pension expenditure accounting for an average of 2.45% of pension expenditure paid by the CSSA. We now assume that this share will remain the same in the future. The share of expenditure on pensions of the armed forces will thus rise from around 0.2% of GDP to 0.3%.

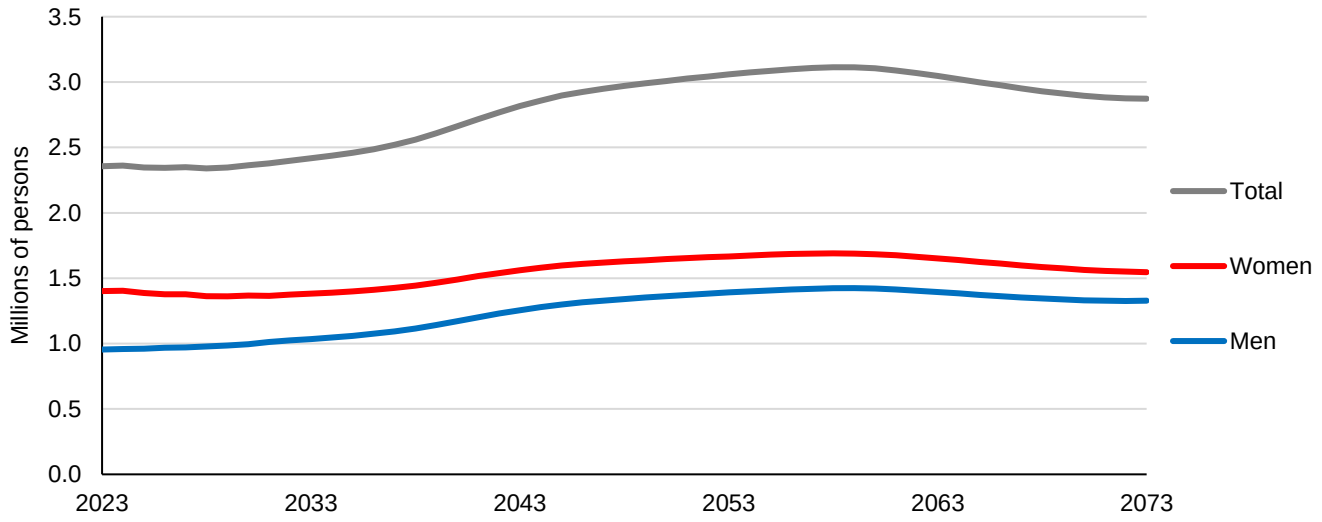
same 65. This statutory age then enters into the basic scenario of our projection.[40]

In estimating pension expenditure, we first estimate the future number of recipients of old-age pensions. In this estimation, we base our estimate on demographic projections and the statutory retirement age, but we also take into account the possibility of early retirement or, conversely, the possibility of working beyond retirement age and thus supplementing one´s old-age pension.

For these reasons, we use "retirement rates" (i.e. the shares of the number of retirees in each age cohort) to project the number of old-age pensioners. In their projection, we also take into account that the number of recipients of old-age pensions interacts with disability pensions, and that the payment of these two pensions is mutually exclusive. For these reasons, in the projection we work with rates of retirements that do not refer to the entire population of a given age, but only to the part of the population that is not receiving a disability pension (for the projection of the number of disability pensioners, see subsection 3.1.2). We construct retirement rates based on the distance in time from the statutory retirement age, which is the main determinant of seniors' decisions about when to retire in the Czech Republic. We derived the retirement rates used in the projection of the number of old-age pensioners separately for men and women as the average of empirical measures of retirement according to reality.[41]

In the baseline projection scenario, there is first a slight decline in the number of old-age pensioners due to the continued extension of the retirement age (a total decline of 0.7% by 2028, mainly due to a decline in the number of female old-age pensioners, see Chart 3.1.1). If the extension of the retirement age to 65 years is stopped in 2030 and the gradual retirement of the baby-boomers born in the 1970s takes place, there will be a steady increase in the number of old-age pensioners thereafter. This will peak around 2058, when there should be around 3.1 million old-age pensioners, i.e. around 32% more than today. The projected number of old-age pensioners will reflect, among other things, the changes in demographic projections discussed above, in particular the increase in population associated with the refugee migration wave (see Box 2.1). Compared to the estimate of the number of pensioners in the previous Long-Term Sustainability Report (2022), the number of pensioners at its peak is thus about 37,000 higher.

Chart 3.1.1 Projection of the number of old-age pensioners (medium variant of the demographic projection)



Source: CZSO (2023), CSSA (2023); CFC calculations.

[40] In one of the alternative scenarios in subsection 5.3, we also consider linking the retirement age to the life expectancy according to Section 4a of Act No. 582/1991 Coll., on the Organisation and Implementation of Social Security, as amended. According to this act, the statutory retirement age should change each time a new demographic projection is published by the CZSO, so that everyone spends on average a quarter of their life in old-age pension. According to the latest CZSO calculations from 2019, the retirement age for people born in 1969 and later should rise above the current 65-year limit. However, the Czech government has decided not to raise the retirement age above this threshold in 2019. According to this provision, a change in the retirement age could thus occur again in 2024. The government is also considering raising the retirement age above this limit.

[41] We considered only one retirement rate for women in aggregate, with a woman with two children as the model situation. For a more detailed description and discussion of the retirement rates and their modifications due to different rates of increase in the retirement age, see the study published by the OCFC (2019): Projekce důchodového systému [Pension System Projections, available in Czech only].

In addition to the change in the number of pensioners, there will also be a change in the gender structure - comparing the statutory retirement ages for men and women will lead to an increase in the share of men in the total number of pensioners from the current 40.5% to 46.2% in 2073. Increasing the male share of the total number of pensioners will also reflect the approaching life expectancy of men and women

The projection of old-age pension expenditure also estimated the level of the average old-age pension. This is affected both by the amount and number of new pensions granted and by the amount of pensions already in existence and therefore granted in the past at various times. The total pension is then the weighted average of these two types of pensions. As a general rule, newly granted pensions are higher than those granted in the past because they are linked to nominal wages, whereas older pensions are indexed to inflation and real wage growth. It is therefore the case that older pensions decline in relative terms with increasing age.[42] The change in the average pension then reflects the evolution of existing pensions, the number and amount of new pensions granted and, finally, the number and amount of pensions that have been cancelled (cancelled pensions are usually lower than the average pension). Thus, if the proportion of newly granted pensions increases, the overall replacement rate tends to increase. However, in 2022 and 2023, due to the relatively significant decline in real wages and the way the existing pensions are indexed, older pensions tend to be higher than newly granted pensions (see Box 3.1).

The amount of the newly granted pensions is made up of the so-called basic flat-rate part, which we assume will remain at 10% of the average nominal wage. The second component of the pension is the so-called earnings-related part, which is derived from the insured person's past earnings indexed to the past evolution of the average wage and to the number of years of contributions (including the so-called non-work validated periods). The calculation also includes two reduction thresholds, which represent an element of redistribution and dampen differences in newly assessed pensions.[43]

We simulate the amount of newly granted pensions in relation to the average wage. As a baseline level of newly granted pensions for our projection, we used the last known fact that the level of new pensions was 46.2% of the average gross wage for men and 41.1% for women.[44]

Women's lower newly granted pensions are due both to their lower wages on average and to their lower statutory retirement age and therefore shorter insurance periods. Once the statutory retirement ages for men and women are equalised (i.e. after 2030), women will have longer insurance periods and the difference between the level of newly granted pensions for men and women will decrease. For men, we assume a stable ratio of newly granted pensions to average wages, while for women we gradually increase this ratio in our projection to reach 44.0% of average wages in 2030. This ratio corresponds to an insurance period including non-work validated periods of 41 years (i.e. about four years more than the current level for women). However, the difference between newly granted pensions for men and women will persist beyond 2030 due to their different wage levels.

As the period of university education will no longer be recognised as a non-work period under current legislation after 2050, we slightly reduce the ratio of new pensions to average wages between 2050 and 2055.

To calculate the overall average pension, it is also necessary to model the evolution of pensions granted in the past. Their amount depends both on the indexation scheme and on changes in the amount of pensions beyond that scheme. In the past years (2018 – January 2022), pensions have always increased on average 2 percentage points faster than the statutory indexation. The level of the replacement rate was significantly affected by price dynamics in 2022 and 2023. In accordance with the law, in addition to the usual January indexation, three extraordinary pension indexations took place in 2022 and 2023: in June 2022, September 2022 and June 2023. Overall, the average pension increased by CZK 4,103, or around 26.4%, as a result of the indexations in 2022 and 2023 (see Box 3.1 for details). Given that real wages have fallen in parallel, and pensions do not fall when real wages fall, then the initial total replacement rate in 2022 and 2023 has risen to 45.8% from 40.2% at the end of 2021.

In our projection, we assume that the indexation scheme will be followed in the future. Thus, in accordance with Section 67 of the Pension Insurance Act, we assume valorisation of existing

[42] If real wages are rising, older pensions are rising more slowly than nominal wage growth. Thus, the pension-wage ratio falls with increasing age (or the time since the old-age pension was granted). See the charts in Box 3.1.
[43] For a more detailed description, see the study published by the OCFC (2019): Projekce důchodového systému [Pension System Projections, available in Czech only].
[44] MoLSA (2021): Statistická ročenka z oblasti práce a sociálních věcí 2021 [Statistical Yearbook of Labour and Social Affairs 2021, available in Czech only]. We use the average of the ratio of new pensions to average monthly wages over the last three years.

pensions by half the growth in real wages[45] and the full rate of inflation. The inflation rate is taken to be either the growth in the general consumer price index or the cost of living index for pensioner households, whichever is rising faster.

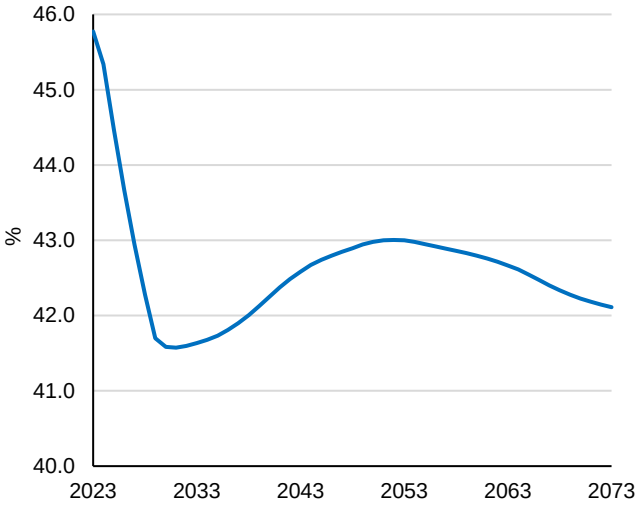
In our projection, we assume 0.3 pp higher growth in the pensioners' cost-of-living index than the CPI inflation rate.[46] In the long run, the latter will grow in line with the CNB's 2% inflation target.

The development of the average old-age pension will also be influenced by other changes in the pension system setup, such as the introduction of the so-called "child-rearing bonus" (an increase in the old-age pension for one child raised by CZK 500 per month from 1 January 2023) In calculating the replacement rate, we take into account the age structure of the amount of old-age pensions for both men and women. See Box 3.1 for details.

Linking all these assumptions to the demographic projection implies a trajectory for average income. After the significant increases from 2022 and 2023, the ratio of average pension to average wage will fall to 41.6% around 2030. There will be a "switch-off" of pension indexation to real wages. The increase in the replacement rate in the 30s and 40s is then due to the high number of newly granted pensions. The replacement rate will then be between 42% and 43% of average wages (see Chart 3.1.2).

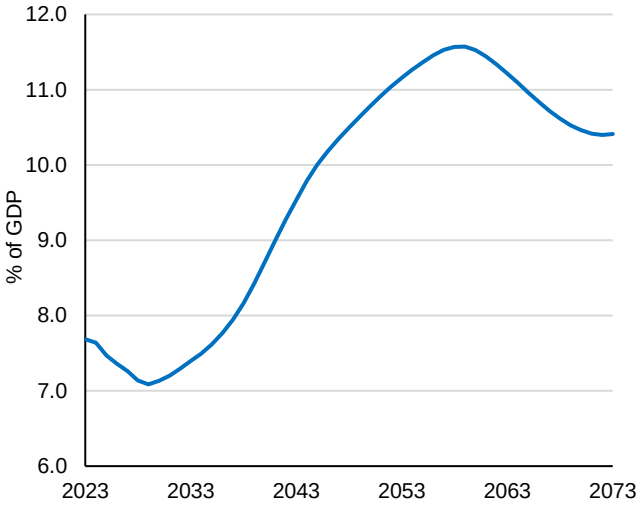
From the number of pensioners and the evolution of the ratio of pensions to average wages, the trajectory of pension expenditure as a share of GDP can be derived. Expenditure peaks around 2059 at 11.5% of GDP (see Chart 3.1.3). The increase in expenditure compared to the present is mainly driven by the growth in the number of pensioners as well as the increased starting level of old-age pensions

Chart 3.1.2 Ratio of average old-age pension to average wage (%)



Source: CZSO (2023), CSSA(2023); CFC calculations.

Chart 3.1.3 Ratio of old-age pension expenditure to GDP (%)



Source: CZSO (2023), CSSA(2023); CFC calculations.

Box 3.1 Effects of price increases on the estimation of the replacement rate

The key parameter for determining the future average pension and, consequently, the cost of the pension system is the so-called replacement rate, which is the ratio of the average pension to the average gross wage. Unpredictable and high price increases between 2022 and 2023[47] have led to an increase in the replacement rate from 40.2% at the end of 2021 to 45.8%. In this box, we briefly describe the effects of statutory and extraordinary indexations on pension levels and their distribution by age.[48] According to the provisions of Section 67 of Act No.

[45] Pensions are only indexed to real wage growth in due course and with a delay. The last time pensions were indexed to real wages was in January 2023, based on real wage growth in 2021. As real wages fell in 2022 and 2023, pensions will only be indexed to real wage growth again when real wages exceed their 2021 level. This is estimated to happen in 2028, so indexation to real wages will start in January 2030.
[46] Over the period 2008 to 2023, annual growth in the cost-of-living index for pensioners was on average about 0.4 pp higher than growth in the standard price index. The difference between the annual increases in the two indices was higher during periods of relatively high price increases, when the weight of food, energy and health care prices in the retiree cost of living index was higher.
[47] Annual growth in the consumer price index peaked at 18% in September 2022 and annual growth in the pensioners' cost of living index peaked at 21.4% in January 2023. Overall, between June 2021 and January 2023, consumer prices rose by 27.1% and the retiree cost of living index by 30.7%.
[48] In last year's Long-Term Sustainability Report (Box 4.1), the method of projecting the replacement rate was modified or refined by using information on the age structure of pensions in payment. See also OCFC (2022): Odhad náhradového poměru dávek důchodového pojištění [Estimating the Replacement Rate for Pension Insurance Benefits, available in Czech only].

155/1995 Coll., on Pension Insurance, as amended, (the Pension Insurance Act), the indexation is always carried out on the so-called regular date, which is January of a given year, based on the price and wage developments in June of the preceding year. If prices have risen by at least 5% since the last increase in pensions, the percentage of pensions paid outside the regular date is increased in the 'extraordinary date'.[49] Unlike regular indexation, exceptional indexation only involves an increase in the earnings-related part; the basic flat-rate part does not change. During 2022 and 2023, extraordinary indexations occurred a total of three times: in June 2022 on the basis of consumer price increases between June 2021 and January 2022, in September 2022 on the basis of increases in pensioners' cost of living between January and April 2022, and in June 2023 on the basis of increases in pensioners' cost of living between June 2022 and January 2023 (see Table B3.1.1). In the June 2023 extraordinary indexation, the Government responded to the increased cost of the pension system by amending section 67ca of the Pensions Insurance Act, which provided that the extraordinary indexation for the average pension was approximately CZK 1,000 lower than would have been the case under the original legislation. The method of extraordinary indexation is also the subject of amendments to the Pension Insurance Act under the so-called consolidation package (see subsection 5.2).

Table B3.1.1 Statutory and extraordinary indexations of old-age pension in 2022 and 2023

	Decisive period for price growth	Price growth (%)	Basic flat-rate part in CZK (increase in CZK in brackets)	Earnings-related part growth (%)	Average old-age pension growth		Fiscal expenditure (CZK billion)
					(CZK)	(%)	
January 2022 (statutory)	6/2020–6/2021	2.8	3,900 (+350)	1.3 and CZK 300	805	5.2	27.6
June 2022 (extraordinary)	6/2021–1/2022	8.2	3,900	8.2	1,017	6.2	20.3
September 2022 (extraordinary)	1/2022–4/2022	5.2*	3,900	5.2	700	4.0	8.0
January 2023 (statutory)	4/2022–6/2022	3.6*	4,040 (+140)	5.1	821	4.7	22.0
Introduction of child-rearing bonus (January 2023)	-	-	-	-	-	-	18.0
June 2023 (extraordinary)	6/2022–1/2023	11.5	4,040	2.3 and CZK 400	760	3.9	15.4

Source.: MoLSA (2023); CFC calculations.
Note: *price growth according to the consumer price index (cost of living) for pensioner households.

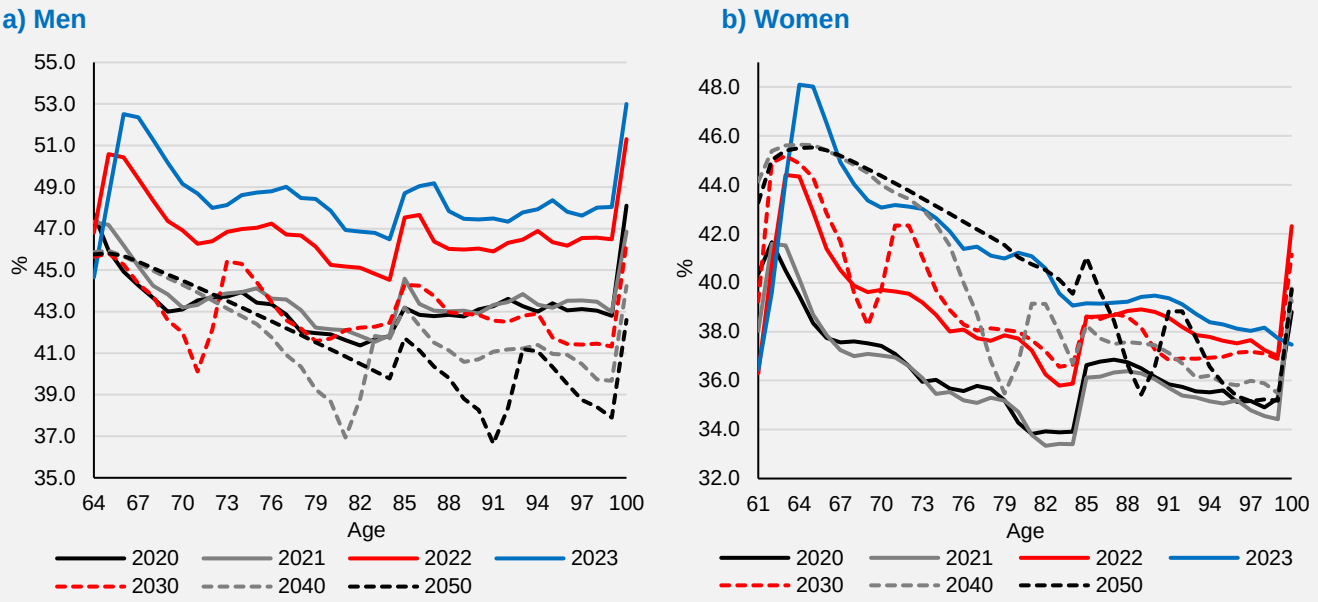
From 2023 onwards, other changes should be reflected in the replacement rate projections. From 1 January 2023, the so-called "child-rearing bonus" was introduced, i.e. an increase in the old-age pension of CZK 500 per month for each child raised.[50] This increase affects both newly granted old-age pensions and pensions granted in the past, and will mainly increase the pensions of women. The initial replacement rate, or the replacement rate of newly granted pensions for the coming years, is also affected by the sharp increase in the number of applications for early retirement at the end of 2022.[51] Most of these pensions have only been assessed and are not yet paid. Those who have had them assessed continue to work and are not registered as old-age pensioners. There has been some 'freezing' of future pension amounts. In our simulations, we assume that pensions newly granted in 2024 will be at the level of 2023 pensions. In our projections, we also project Section 67(13) of the Pension Insurance Act, which states that pensions will only be further indexed to real wage growth when real wages exceed their level since "the previous increase in pensions which took into account the real wage growth", i.e. their 2021 level. This is projected to occur in 2028, so indexation to real wages will start in January 2030. Until then, any increase in real wages will lead to a fall in replacement rates. The above changes will be reflected in the age structure of pensions granted (Chart B3.1.1).

The graph shows a clear increase in the replacement rate across age groups between 2020 and 2023, where the above discussed waves of valorisation and the impact of the asymmetry of the valorisation mechanism have become apparent. For women, the introduction of the child-rearing bonus in 2023 has also had an impact. The period up to 2030 will see a gradual increase in real wages, which will not be reflected in pension growth at all. For pensions granted until 2023, this decline will imply a gradual adjustment of the increase in replacement rates due to the exceptional indexation. The group that will pay the most for the cessation of indexation to real wages

[49] Valorisation is carried out either according to the consumer price index or the index of prices (cost of living) of pensioners' households, based on whichever of the two indices published by the CZSO is higher. It may thus happen that pensions are indexed several times during the year according to different price indices. This is exactly what happened in 2022.
[50] See also OCFC (2022): Dopady zavedení „výchovného“ do starobních důchodů [Impacts of the Introduction of the “Child-rearing Bonus“ on Old-Age Pensions, available in Czech only]
[51] The CSSA received a total of 80,309 applications for early retirement pensions in 2022 (https://www.cssz.cz/-/aktualni-situace-v-oblasti-vyrizovani-ducho-1). In the period from 1 January 2023 to 31 May 2023, a total of 49,463 applications for early retirement pensions were submitted. In the period 2015–2021, an average of about 30,000 such applications were registered annually.

will be the group of people with newly granted pensions between 2024 and 2030. These people will no longer benefit from the exceptional indexations of 2022 and 2023 and their pensions will depend on real wages, which have fallen significantly in these years. If real wages subsequently rise between 2024 and 2028, they will be prevented from indexing their pensions to real wages in the same way as those with pensions that were subject to the exceptional indexations of 2022 and 2023.

Chart B3.1.1 Ratio of average old-age pension to average wage (%)



Source: CZSO (2023), MoLSA (2023); CFC calculations.
Note: 2020 and 2021 show the reality, 2022 and 2023 show the simulation of age structure according to actual average pension and indexation parameters, projections from 2024 onwards.

3.1.2 Disability pensions

When projecting the development of disability pensions, as with old-age pensions, we first project the number of beneficiaries and then the amount of the average disability pension. The projection of the number of invalidity pensioners is based on assumptions about the proportion of persons receiving disability pensions in each age cohort (disability rate). As with the pension rates, we distinguish between rates for men and for women.[52] The disability rate increases with age, with a historical peak between 60 and 61 years for men and 56 and 58 years for women. The peaks of the age-specific disability rate curve are currently lower than in the past. This is mainly due to the healthy ageing hypothesis.[53]

Near retirement age, disability rates are mainly affected by the conversion of part of disability pensions to old-age pensions. Disability rates are decreasing here as some disability pensioners opt for old-age pensions and are thus removed from the disability pensioner register. Some disability pensioners with higher disability pensions continue to receive this pension until the age of 65, when their disability pension is automatically converted into an old-age pension. In the over-65 population, the disability rate is then zero.

In our projection of age-specific disability rates, we take into account the increasing retirement age. For the population aged under 55, we assume age-specific disability rates consistent with the past. We further assume that the peak of the disability curve occurs two years before retirement age. Thus, from age 55 onwards, disability will increase steadily until this peak. We again assume a steady decline in the disability rate from its peak to age 64, and assume a zero disability rate from age 65.

In our projection, the number of disability pensioners gradually increases, reaching a maximum level in 2036, when it will be 10.2% higher than now. The increase in the number of disability pensioners is related both to the ageing of the population and to the extension of the statutory retirement age, especially for women. Between 2037 and 2060, the number of disability pensioners will decline as they move into old-age retirement. In 2060, the number of

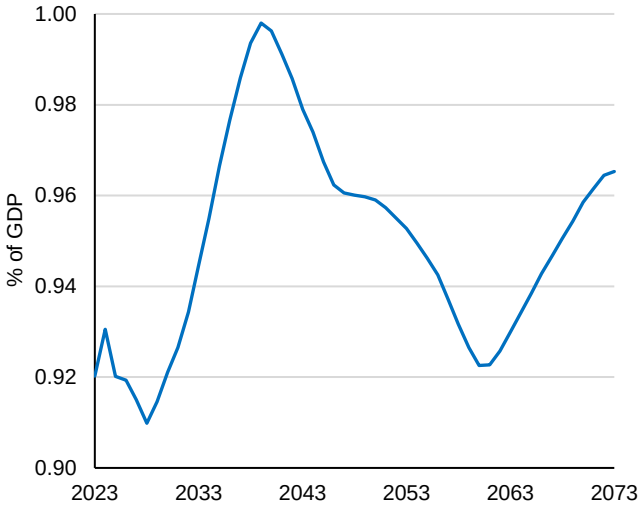
[52] For a more detailed description of how the number of disabled pensioners is projected, see the study published by OCFC (2019): Projekce důchodového systému [Pension Systém Projections, available in Czech only].
[53] For the healthy ageing hypothesis, see the 2018 Long-Term Sustainability Report.

disability pensioners will be 8.9% lower than at present, and then increase slightly over the projection period.

We project the amount of the average disability pension by assuming a constant ratio between the average disability pension for a given degree of disability and the average old-age pension. The dynamics of the average disability pension thus follows the growth of old-age pensions (see Chart 3.1.2). The initial level of disability pensions is affected by the indexation in 2022 and 2023, but their increase has been less pronounced in recent years compared to old-age pensions.

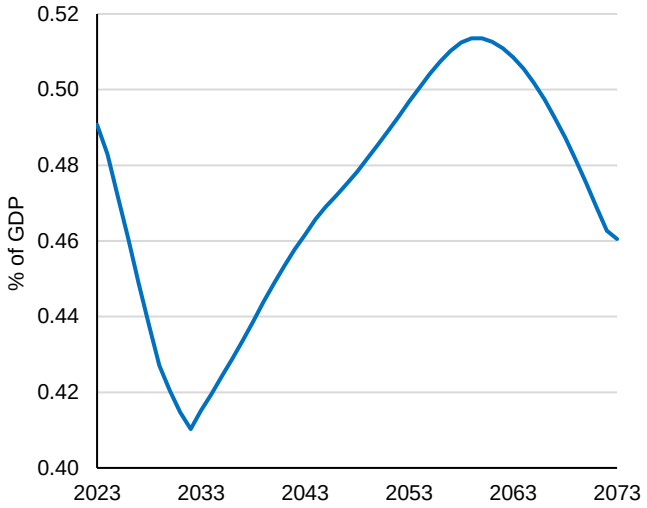
Overall, the projection suggests that, mainly due to the projected increase in the number of recipients of disability pensions, the volume of expenditure on these pensions will increase from 0.9% of GDP at present to 1.0% of GDP in 2039 (see Chart 3.1.4 and Table 3.1.1). Thereafter, the share of expenditure on disability pensions will decline to 0.92% of GDP in 2060.

Chart 3.1.4 Ratio of expenditure on disability pensions to GDP (%)



Source: CSSA (2023); CFC calculations.

Chart 3.1.5 Ratio of expenditure on survivors' pensions to GDP (%)



Source: CSSA (2023); CFC calculations.

3.1.3 Survivors´ pensions

Survivors' pensions consist of widows', widowers' and orphans' pensions. Again, we first simulate the number of beneficiaries of each type of pension. For orphans' pensions, we assume that the proportion of beneficiaries in the population of 0 to 21 year olds is stable.[54]

In the case of widow's and widower's pensions, it is necessary to distinguish between pensions paid separately (solo) and pensions paid together with an old-age (or disability) pension. In the case of widows' and widowers' pensions paid solo, we assume an approximately stable share of the adult population (i.e. for our purposes, persons over 21 years of age) not receiving an old-age or disability pension.

Both the number of recipients of orphan pensions and the number of recipients of solo widow/widower pensions are projected to decline slightly, as both defined demographic groups used as the basis for the projection are shrinking slightly despite the increase in the retirement age.

A more complicated approach is used to project the number of widows' and widowers' pensions paid out in combination with old-age or disability pensions. For the projection, we use age-specific rates of receipt of widow's (and, by analogy, widower's) pensions, which show what proportion of women (or men) of a given age receive this type of pension. The curve of these age-specific rates increases with age. In the projection, we adjust the age-specific combination survivor's pension rates to account for the rise in statutory retirement age until 2030 and for the increase in life expectancy (we take into account the increase in the life expectancy of men for widow's pensions and the increase in the life expectancy of women for widower's pensions).[55] Raising the statutory retirement age reduces the number of persons entitled to a combination survivor's pension, as the number of pensioners decreases, all other things being equal. If life expectancy increases, or if male and female life expectancy converges, then the event of widowhood shifts to a higher age on

[54] You can receive an orphan's pension up to the age of 26 (if you are a university student).
[55] For details, again, see OCFC (2019): Projekce důchodového systému [Pension Systém Projection, available in Czech only].

average. Thus, despite the increasing total number of seniors in the population, there is a slight decline in the number of combination survivors´ pensions in our projection.

We again model the level of survivors´ pensions as a fixed ratio to the old-age pension based on the average of the last three years. Overall, the projection of survivors' pensions shows a relatively insignificant evolution between 0.40% and 0.51% of GDP in total for all types of survivors' pensions, with a decline of about 0.08 pp initially until 2032, mainly with regard to the development of the old-age pension (Chart 3.1.2), followed by an increase of 0,1 pp in survivors' pensions until 2059 (see Chart 3.1.5 and Table 3.1.1).

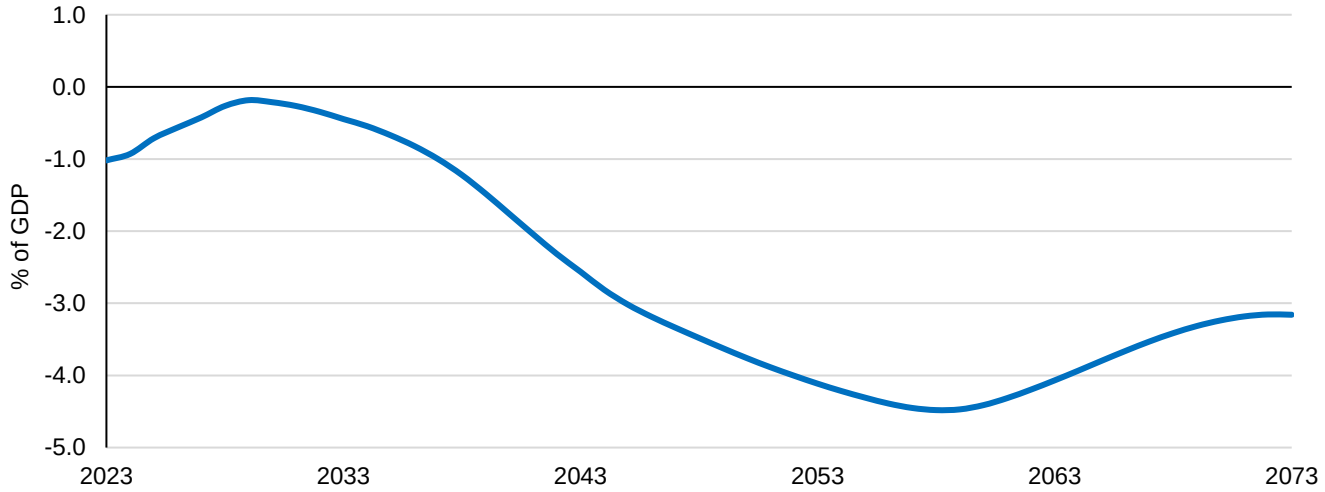
3.1.4 Total revenue, expenditure and balance of the pension system

We model pension system revenue on the basis of the assumed evolution of workers' compensation. In our macroeconomic projection, we assume that the ratio of these compensation to GDP will grow due to convergence (see subsection 2.3). Thus, the ratio of pension system revenue to GDP will also grow proportionally. Overall, the revenue of the system will increase from 8.3% of GDP (2023) to around 9.0% of GDP at the end of the projection period. Clearly, such an increase in revenue to the system cannot be sufficient to cover the sharp increase in expenditure that will occur, especially in the 2030s. The pension system balance will also be affected in the short and medium term by the increase in expenditure related to the indexation of pensions in 2022 and the introduction of the child-rearing bonus in 2023 (see subsection 3.1.1).

The pension system as a whole will show moderate deficits in the coming years, which will improve until around 2030. However, after 2030, due to the significant increase in the number of pensioners, it will start to move into significant deficits, peaking around 2059, when they are projected to reach around 4.5% of GDP per year (see Chart 3.1.6). The subsequent decline in expenditure and improvement in the pension balance will be driven by a reduction in the number of pensioners.

In our projection, we assume that the pension system operates according to the current statutory set-up. However, the above-mentioned development of deficits will necessitate pension reform. At the same time, some parametric changes in the pension system settings are already in various stages of the legislative process. We discuss the impact of these changes under alternative scenarios in subsections 5.2 and 5.3.

Chart 3.1.6 Annual balances of the pension system



Source: CZSO (2023), CSSA (2023); CFC calculations.

Table 3.1.1 Summary of pension projections for selected years (% of GDP)

	2023	2033	2043	2053	2063	2073
old-age pensions	*7.9*	*8.2*	*10.1*	*11.5*	*11.5*	*10.7*
disability pensions	*0.9*	*1.0*	*1.0*	*1.0*	*0.9*	*1.0*
survivors' pensions	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
Total expenditure	9.3	9.7	11.5	12.9	12.9	12.1
Total revenue	8.3	8.5	8.7	8.8	8.9	9.0
BALANCE	-1.0	-1.2	-2.9	-4.1	-4.0	-3.1

Source: CZSO (2023), CSSA (2023); CFC calculations.
Note: old-age pensions including pensions of members of the armed forces. Totals in the table may be subject to inaccuracies due to rounding.

3.2 Health care

The majority of health care expenditure in the Czech Republic has long been covered by public funds, which account for approximately 85% of the financing. The most important source of funding is payments by health insurance companies. According to the most recently available data, they accounted for approximately 70% of total health spending in 2020.[56] It is this part of expenditure that we focus on in our projection. Accordingly, we also focus only on the public health system on the revenue side.

For the projection of health expenditure, the basic assumption is a sufficiently stable per capita health expenditure profile over time, distinguishing between age-specific health expenditure for men and women. Despite the assumption of a stable cost curve, it may change over the projection period. For example, the cost curve may change in line with the concept of healthy ageing or the morbidity effect.[57]

In our macroeconomic projection, we assume that real wages will grow faster than labour productivity or GDP per capita (see subsection 2.3). If we assume that health care wages maintain their current relative level to the average wage, an increase in the wage-to-GDP ratio will, other things being equal, lead to an upward shift in the health care cost curve, as wage costs are a significant component of health care spending.

On the other hand, the relative price of some non-wage cost items, such as imported pharmaceuticals or medical equipment, may be falling precisely because of real convergence. In fact, real convergence causes, among other things, the convergence of the domestic price level to the foreign price level, and thus the appreciation of the real exchange rate, which may in turn hamper the growth of health spending. Given the above uncertainties about the direction of the age-specific health expenditure curve, we use a stable curve empirically derived as the average of the respective curves over the period 2010 to 2019 in the simulation, working separately with the curve for men and the curve for women. We deliberately do not use post-2019 data in the average, as the pandemic COVID-19 has led to an increase in health care costs. In the long run, however, we expect unit costs to return to pre-pandemic levels.

A stable cost curve over time assumes that health care costs per person of a given age change in proportion to GDP per capita. Thus, if there were no change in the demographic structure, health spending would increase in proportion to the growth of the economy. Thus, any changes in the share of health expenditure are only a consequence of the changing age structure of the population. Given the shape of the curve, which shows increasing costs covered by health insurance with age, population ageing implies a gradual increase in total health expenditure (see Chart 3.2.1).

Currently, health insurance expenditure is 5.6% of GDP. Under the medium variant of the demographic projection, the total amount of costs covered by public health insurance would increase by around 1 pp over time until the first half of the 60s of this century (see Chart 3.2.2). As in last year's Long-Term Sustainability Report, our projection for the health care sector continues to assume that there will be no significant increase in health insurance costs in the long term as a result of the pandemic. For this reason, we do not anticipate a direct impact of the pandemic on future spending by insurers.

The revenue side of the public health insurance system relies on contributions paid by employees, employers and self-employed persons or persons without taxable income, and on contributions paid by the state for the so-called “state insurees“, i.e. mainly children, students, old-age and disability pensioners, the unemployed, etc. However, payments for state

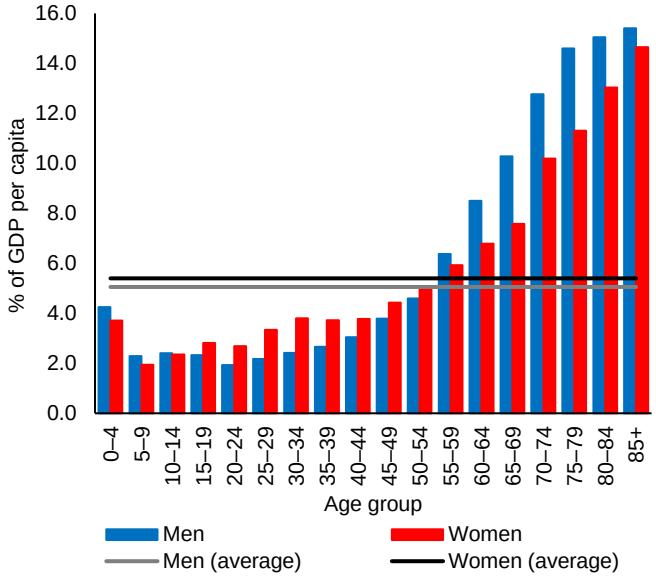
[56] See CZSO (2022): Výsledky zdravotnických účty ČR 2017–2020 [Health Accounts of the Czech Republic 2017–2020, available in Czech only].
[57] See CFC (2021): Report on the Long-Term Sustainability of Public Finances, Box 4.3.

insurees are budget neutral in terms of the overall government deficit, as they represent revenue for one part of the government budgets, i.e. the health insurance companies, and expenditure of the same amount for another part of the budget, i.e. the central government.

We estimate the contributions collected from the first group as a constant ratio to compensation of workers. Here, we project a modest increase in contributions collected due to the projected increase in the ratio of wages and salaries toGDP.

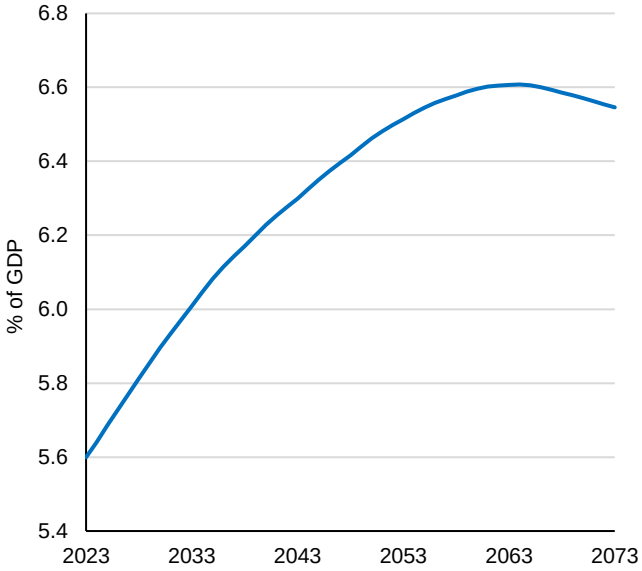
In order to mitigate the drop in income and at the same time to increase the expenses of the public health insurance system in connection with the COVID-19 pandemic, the reference base for the payment of health insurance for state-insured persons increased from 22% to approximately 35% of the average wage in 2021 compared with 2019. The reference base in 2022 remained at the level of 2021. In 2023, the amendment to the Act of the Czech National Council No. 592/1992 Coll., on Public Health Insurance Premiums, as amended, set the reference base at CZK 14,074.

Chart 3.2.1 Costs covered by the health insurance by age group



Source: CZSO (2023); CFC calculations.
Note: average values for 2014–2019.

Chart 3.2.2 Ratio of public health care expenditure to GDP (%)



Source: CZSO (2023); CFC calculations.

For the period after 2023, a mechanism of automatic indexation of payments for state insurees has been adopted. According to the automatic valorisation according to the amendment of the Act of the Czech National Council No. 592/1992 Coll., on Public Health Insurance Premiums, as amended, from 2024 the payments for state-insured persons will be automatically valorised according to increase in price and half of the increase in real wages.[58] This indexation is already included in the projection.

We therefore assume that the reference base will automatically increase in line with the indexation mechanism. Inflation is assumed to be at the inflation target level, i.e. 2%. Nevertheless, over the projection period, health insurance revenues for the state-insured will fall from around 2% of GDP today to 1.5% of GDP in 2073.[59] The ageing population and the associated increase in the number of old-age pensioners will also have an effect on the level of payments for the state-insured.

Total revenue to the health insurance system, which will reach 6.3% of GDP in 2023, will gradually decline to 6.2% of GDP at the end of the projection period, assuming automatic indexation of the reference base for payments for state-insured persons. Thus, under the medium variant of the demographic projection, the public health insurance system will be in a slight deficit from 2059 onwards. This scenario also assumes that unit costs, which increased during the COVID-19 pandemic, return to pre-pandemic levels. Nevertheless, there is some risk that these cost increases could be locked in at higher levels, leading to a deterioration in the balance of the health insurance system.

[58] See again Act of the Czech National Council No. 592/1992 Coll., on Public Health Insurance Premiums, as amended.
[59] The reason for this decline is the previous excessive growth in revenue for state insurers in the context of the COVID-19 pandemic, as discussed earlier in this subsection 3.2.

3.3 Non-pension social benefits in cash and long-term care

Other expenditure items are non-pension social benefits in cash and long-term care. In the model, we first simulate benefits that are sufficiently fiscally significant with a share of GDP above 0.1%. At the same time, these benefits must be linked to demographic change. Expenditure on maternity benefits, parental allowances, care allowances and housing allowances fulfil these two criteria. These non-pension social benefits also include tax advantage for dependent children. We then estimate the evolution of other benefits, assuming that their share of GDP remains constant at the current level. Other benefits include unemployment benefits, child allowance, foster care benefits, birth and funeral grants, sickness benefits and social assistance/need benefit.

We simulate expenditures on fiscally significant social benefits separately, and use their link to demographic change for the simulation. In the case of the housing allowance, we have verified the link to demographic change on the basis of past trends. For some benefits, such as maternity benefit and parental allowance, the link to demographic change follows from the design of the benefit itself. For the simulation, we use our modified CZSO demographic projection. At the same time, we assume that the ratio of the average benefit amount to the average wage is maintained and that the current non-take-up rates of some benefits are maintained.

We base our simulation of **maternity benefit** on the construction of that benefit. We use a constant ratio of the average benefit amount to the average wage amount multiplied by the duration of receipt of the benefit as the basis. We link the projection of this benefit to the projection of the number of new births.

The projection of **parental allowance** expenditure is linked to the development of the number of children up to the age of four. The simulation is based on data on the structure of parental allowance recipients by age of child, the number of parental allowance payments and the number of terminations by age of child at the time of termination. We then calculated the proportion of recipients in each age cohort and their average monthly parental allowance amount. In the simulation, we assume that this share, together with the ratio of the average monthly benefit to the average wage, is constant over time. The parental allowance is increased to CZK 300,000 from 2020 and remains at this level for 2023.[60]

To estimate the **care allowance**, we use the proportion of persons receiving the allowance in certain age groups and in given dependency categories (Czech Labour Office data).[61] Assuming a stable proportion of persons of a given age receiving the allowance, we then determine the total number of persons receiving the allowance in each dependency category on the basis of demographic projections. The amount of the care allowance is determined by the approved legislation.[62] From 2023 onwards, we assume a constant allowance to average wage ratio.

The projection of the **housing allowances is** also linked to demographic change. We simulate the allowance according to past trends based on CZSO data. This shows that approximately 25% of the number of housing allowances payments are made to people over 65 years of age.[63] The remaining three quarters of beneficiaries are then between 18 and 64 years old. From July 2020, entitlement is based on the number of persons actually living in the allowance applicant´s household, regardless of their permanent residence.

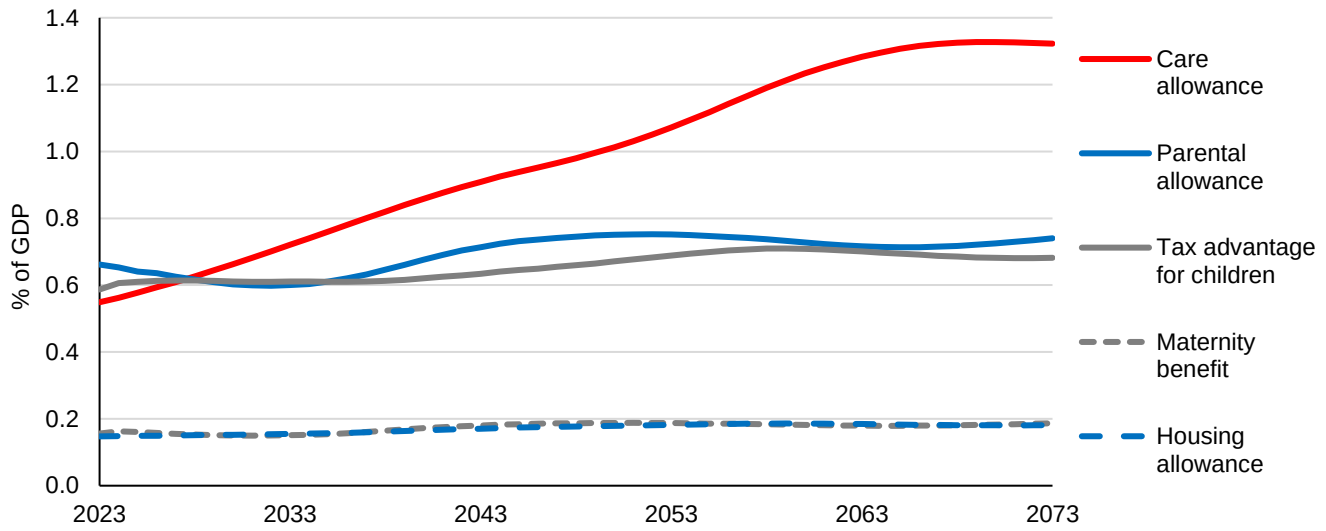
The evolution of **the tax advantage for children** is linked to the evolution of the number of children and the share of secondary school and higher education students. Minors under the age of 18 are eligible for the benefit. It also applies to persons under the age of 26 who have student status or who, for health reasons, are unable to undertake continuous training for a future occupation or to engage in continuous gainful activity. In 2023, as in 2022, the annual amount of the tax benefit is CZK 15,204 for the first child, CZK 22,320 for the second child and CZK 27,840 for the third and each subsequent child. In the simulation we use the average of the values of the benefits for the first and second child, i.e. CZK 18,762. We assume that the amount of the tax advantage for children will increase in line with the average wage.

[60] For parents of two or more children born at the same time, the total amount of the benefit is CZK 450,000. In the model, however, we simulate a uniform parental allowance of CZK 300,000 for all children. According to the CZSO, the share of multiple births in all births was only 1.3% in 2019 (in 2009, this share was 2.1%).
[61] The share of individuals receiving the care allowance increases significantly after the age of 75. For a detailed description of how this is calculated, see the background study by the OCFC (2019): Odhady nákladů příspěvku na péči v návaznosti na stárnutí populace [Estimates of the Cost of the Care Allowance as the Population Ageing, available in Czech only].
[62] Specifically, Section 11 of Act No. 108/2006 Coll., on Social Services, as amended. The monthly amount of the care allowance for persons over 18 years of age ranges from CZK 880 in the lowest level 1 to CZK 19,200 in the highest level 4. The allowance is higher for persons under 18 years of age.
[63] We also verified this figure using EU-SILC data for the Czech Republic from 2018, according to which the share of people aged 65+ receiving housing benefit is 20% and the share of total expenditure on housing benefit is 22.5%.

Projections of the evolution of expenditure on individual benefits as a share of GDP are shown in Chart 3.3.1. Expenditure on the care allowance rises throughout the period under review, from 0.6% of GDP today to more than 1.3% of GDP in 2073. This growth rate will only start to slow down in the late 2060s.

Expenditure on parental allowance will decrease until around 2030, then increase until the first half of the 2050s, after which it will alternate between a period of slight decrease and a period of slight increase. This is due to the expected evolution of the number of children under the age of four. The amount of tax advantage per child will rise slightly from 0.6% of GDP until 2060 and then start to fall to 0.7% of GDP in 2073. The total amount of non-pension social benefits paid will rise slightly from 3.0% to 3.1% of GDP by the 2030s, as rising expenditure on care allowance and falling expenditure on parental allowance roughly balance out. Thereafter, the volume of non-pension social benefits will increase, mainly due to rising expenditure on the care allowance. From the early 2060s onwards, total expenditure will grow more slowly, reaching 4% of GDP in 2073.

Chart 3.3.1 Projections of non-pension social benefits in cash



Source: CZSO (2023), MoLSA (2023); CFC calculations.

3.4 Education

The share of education spending relative to GDP was around 4.8% in 2022, with the Ministry of Education, Youth and Sports (MEYS) accounting for the largest share of public spending on education. It pays over 75% of its budget in the form of transfers to local public budgets. In addition to the MEYS, municipalities and regions, which are responsible for the establishment and management of educational institutions ranging from kindergartens to vocational schools, also contribute to education spending.

The most significant part of public expenditure on education is the wage costs of regional education. These are based on salary and wage increases and on the number of employees, which is directly related to the number of pupils. The projection of education expenditure shown in Chart 3.4.1, assumes that the ratio of teaching and non-teaching staff per 1,000 pupils in each type of school remains constant over the projection period. Similarly, the share of pupils in each age group is kept constant in the projection at the average of the actual shares from 2015 to 2019. After an initial acceleration, the dynamics of public expenditure on education will slow down, especially in the 2030s, due to demographic developments as fewer pupils will require fewer teaching and non-teaching staff in the education system.

The growth of total expenditure on education is mainly influenced by the dynamics of salaries of teaching and non-teaching staff. Between 2019 and 2021, the dynamics of average wages in the education sector was higher than the growth of average wages in the economy, as the previous government committed in its programme statement that in 2021 the salaries of teaching and non-teaching staff would reach at least 150% of the 2017 level. In the following years, we assume the same dynamics as the average wage in the economy. Thus, the projection does not assume a guaranteed level of teachers' salaries at 130% of the average gross monthly nominal salary according to the amendment to Act No. 563/2004 Coll., on Teaching Staff, as amended, as the calculation basis is not clearly defined at present. The amendment to the

aforementioned Act was signed by the President of the Republic on 7 June 2023, but the MEYS still wants to negotiate the level of teachers' salaries with the education unions.

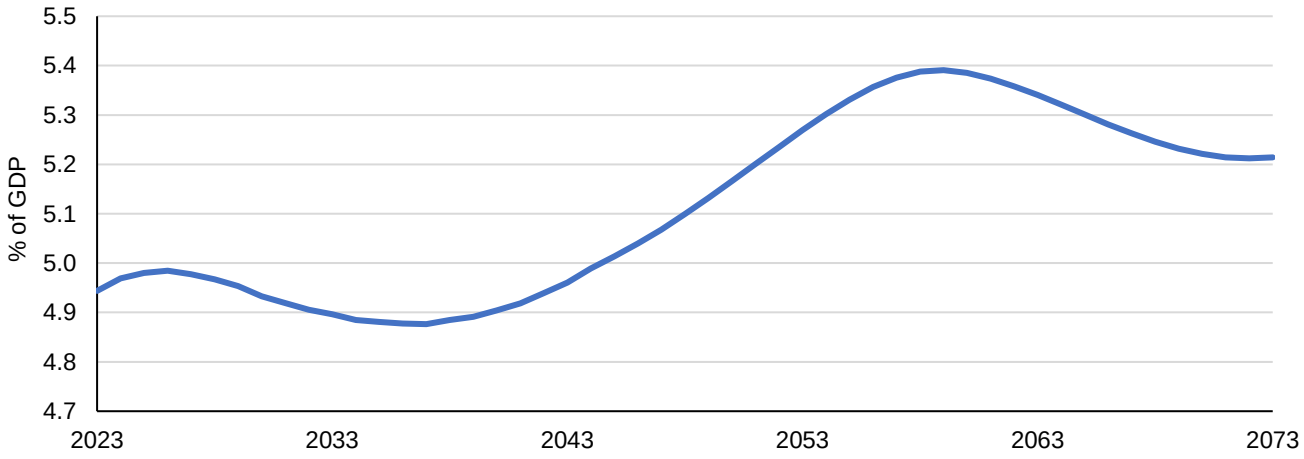
A significant part of the MEYS´ expenditure consists of payments made directly to universities for the regular university activities and for research and development (R&D). In particular, payments to universities show the opposite trend to that in transfers to local government budgets. Their share in the budget heading´s total costs is decreasing. While in 2013, expenditure on universities accounted for almost a third of the total expenditure of the MEYS, in 2022 it was only 19%. In the future, however, we project that expenditure on universities will not fall any further, mainly due to rising wage costs. The share of university students aged 18 to 26 in the total population in this group is comparable to the level of this indicator in Austria. For this reason, we keep the share of students in the same age group in the total population at the current level for the purposes of the projection. In view of the demographic projection, we can therefore expect an increase in the number of university students, which is expected to peak in the 30s.

In the operating expenditure of universities, the wage dynamics will be reflected in an increase in the compensation of academic staff, the number of which is also largely dependent on the quantity of students. Given demographic trends, the number of university students will continue to grow for another decade, which will be reflected in the need to expand the capacity and equipment of universities. Thus, most of the operating costs of public universities in our model depend on demographic developments, and for the remaining one-third of these costs we assume growth in line with GDP growth. We also reflect in our projection additional education spending of 1.5% of GDP, which includes e.g. capital expenditure or other current expenditure, for which we assume growth in line with GDP.

We also expect universities' R&D spending to increase in the long term. We assume that the level of R&D spending is two-thirds influenced by wage growth in the education sector, with one-third of the costs rising in line with real GDP.[64]

Aggregate spending on education in real terms will increase over the entire projection period. In relation to GDP, it will increase over the next three years due to rising wage costs. However, education expenditure relative to GDP will decline over the next 11 years due to demographic change as the number of pupils in public schools (excluding universities) declines. Around 2040, however, the growth rate of public spending on education relative to GDP will start to accelerate again to 5.4% in the second half of the 2050s, but will slow down again in the last 13 years of our projection due to demographic developments.

Chart 3.4.1 Ratio of public education expenditure to GDP (%)



Source: MEYS (2023), CZSO (2023); CFC calculations.

3.5 Expenditure associated with convergence effects and other expenditure

So far, we have discussed the expenditure that we expect to be more or less linked to demographic change. For the remaining public sector expenditures, we can assume that its share of GDP will remain fairly stable. However, regardless of demographic developments, the very fact that the

[64] This assumption is based on Eurostat statistics, according to which payments to employees on the basis of a five-year average account for two-thirds of total tertiary education spending.

Czech economy is a converging economy will systematically affect some other expenditures in the long run. However, our aim is not to simulate the shares and evolution of individual expenditure categories in detail. Rather, we aim to capture the systematic and long-term changes that will result from convergence. For this reason, we focus on the contribution of convergence effects to the growth or decline in total expenditure (expressed as a % of GDP).

The first category of expenditure where convergence effects can occur is **public investment**. This relationship is based on analyses carried out on a sample of EU countries, which show an inversely proportional relationship between a country's economic maturity and the share of public investment in GDP. Less developed countries tend to spend a higher percentage of GDP on public investment. There are probably several reasons for this. Less developed (but converging countries) try to overcome the inadequate level of infrastructure (highways, railways, urban infrastructure, etc.), which results in a higher level of public investment. Another possible reason is the higher relative price level of capital goods in less developed countries, which directly leads to a higher share of investment in GDP. The higher relative price level of investment may be due to economic patterns (different endowments of less developed economies with capital, labour and technology), but also to the lower quality of public administration, as indicated, for example, by quality of governance indices.[65] The CFC projection foresees that these effects will diminish as the Czech Republic becomes more advanced, leading to a decline in the share of public investment by 0.3% of GDP over the projection period (see Table 3.5.1).

Although there are no convergence effects in the sense that **defence spending** would rise or fall as a result of the convergence of the Czech economy, the projection assumes that, the Czech Republic will honour its commitments to the North Atlantic Treaty Organisation (NATO) in line with the approved Defence Financing Act[66] and spend 2% of GDP on defence from 2024 onwards. The projection works with defence spending of around 1.5% of GDP in 2023 and further assumes defence spending at a stable level of 2% of GDP from 2024 onwards.

The convergence of the Czech economy will also have an impact on the **remuneration of public sector employees**, which will represent an additional expenditure constraint. This is due to the assumption of a gradual increase in the costliness of the activities provided by public sector organisations. The growth in labour productivity and the increase in the share of compensation of employees in the private sector will cause wage pressures that will inevitably spill over to the public sector. However, the activities in this sector are mostly of a service nature, and, moreover, such that it is not possible to fully compensate for wage growth through labour productivity growth (public administration, justice and internal security, etc.). As a consequence, even if the scope of services produced by public sector employees remains the same, costs will rise, and hence the relative share of GDP will rise. This is a manifestation of the so-called Baumol-Bowen effect: goods whose production does not lead to a long-term increase in labour productivity (if they are to be provided at the same quality) necessarily become relatively more expensive as a result of wage growth in other sectors.

This section does not simulate the impact of the Baumol-Bowen effect on health, education and defence spending, as these are already included in the sub-projections presented in the previous sections of the Long-Term Sustainability Report. In the remaining areas, our projection assumes that this effect will gradually increase and represent an additional 0.4% of GDP on the expenditure side at the end of the projection period.

In addition to convergence effects, we also take into account the increase in **payments to the EU.** The adoption of the Multiannual Financial Framework for the period 2021–2027 has led, among other things, to a permanent increase in the ceiling for payments to 1.4% of gross national income.[67] However, with the exception of 2020, in the previous programming period 2014–2020, annual payments to the EU did not reach the then applicable ceiling. Thus, as in previous Long-Term Sustainability Reports, we continue to envisage an increase of 0.1% of GDP in payments to the EU from 2028 onwards (compared to the current situation).

For the remaining expenditure of 17.1% of GDP, we assume no sensitivity to demographic developments, convergence or other effects. We therefore keep their level constant until the end of the projection period. Their size is derived from the cyclically adjusted evolution of the general government sector in 2013–2021.

[65] See e.g. World Economic Forum (2020): The Global Competitiveness Report 2020.
[66] Act No.177/2023 Coll., on Financing the Defence of the Czech Republic and on Amending Act No.218/2000 Coll., on Budgetary Rules and on Amending Certain Related Acts (budgetary rules), as amended.
[67] Council Decision (EU, Euratom) 2020/2053 of 14 December 2020 on the system of own resources of the European Union and repealing Decision 2014/335/EU, Euratom.

Table 3.5.1 Ratio of expenditure associated with convergence effects and other expenditure to GDP (%)

	2023	2033	2043	2053	2063	2073
Other expenditure – baseline scenario	17.1	17.1	17.1	17.1	17.1	17.1
Convergence-related changes in other expenditure	0.0	0.6	0.6	0.6	0.6	0.7
public investment	*0.0*	*-0.1*	*-0.2*	*-0.3*	*-0.3*	*-0.3*
defence expenditure	*0.0*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
growth in general government costs	*0.0*	*0.1*	*0.2*	*0.3*	*0.3*	*0.4*
growth in payments to EU	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
OTHER EXPENDITURE INCLUDING CHANGES	17.0	17.7	17.7	17.7	17.7	17.8

Source: CFC calculations.
Note: the data in the table may be subject to inaccuracies due to rounding.

3.6 Revenue in the long-term projection

For general government revenue, demographic and convergence effects are intertwined in the long-term projection. For the purposes of this Long-Term Sustainability Report, government revenues are divided into the following groups: revenues from personal and corporate income taxes, statutory social security contributions, revenues from consumption taxation and other revenues (e.g. property income, revenues from sales of goods and services, EU revenues).

In projecting the **personal income tax** (PIT) revenue, we assume that it depends mainly on compensation of employees. According to our estimates, the convergence effect will gradually increase the share of compensation of employees in GDP (see subsection 2.3), and the share of this tax in GDP will grow proportionally with it. This effect will outweigh the fact that the share of workers in the total population will decline for demographic reasons. According to our macroeconomic projection, wages will grow fast enough to more than compensate for the decline in the number of workers.[68] Thus, the expected increase in the PIT yield from the current 3.5% of GDP to 3.8% of GDP at the end of the projection is only a consequence of convergence developments (see Table 3.6.1).

Corporate income tax revenue is highly sensitive to the business cycle and therefore its level fluctuates over time. The design of the tax base also makes the tax difficult to predict. However, in the long-term projection, we disregard cyclical effects and, for the sake of logical consistency, project its revenue according to the evolution of the net operating surplus. The latter should explain the evolution of the tax yield better than the evolution of GDP, since the net operating surplus is the macroeconomic counterpart of pre-tax net operating profits.[69] Similar to the case of personal income tax, convergence effects will be present, but they will have the opposite effect. A rise in the share of compensation of employees in GDP will necessarily lead to a fall in the share of gross operating surplus in GDP. The share of net operating surplus in GDP will then fall even more sharply, as we assume that the share of fixed capital consumption in GDP remains unchanged. As a result, the share of corporate income tax revenue in GDP will fall from 3.7% at the beginning of the projection to 2.8% at the end of the projection.

For **other current taxes,** we assume a fixed share of GDP. Their share of GDP has been stable in the past and, given the tax policy settings, we are not aware of any reasons to change it.

Mandatory social security contributions include contributions to pension insurance (including the Ministry of Defence, the Ministry of Interior and the Ministry of Finance), contributions to public health insurance excluding state insurees, payments on behalf of state insurees and other mandatory social security contributions (sickness insurance contributions and contributions to state employment policy). All of these payments are linked to the compensation of employees in our projection in a similar way to personal income tax, given their design. Here again, the convergence effect is evident – their share in GDP increases proportionally with the increase in the share of compensation of employees. In the case of income for state insurees,

[68] Note that we are partly departing here from carrying out the projection strictly in accordance with current legislation. Tax regulations often include deductions and discounts or thresholds stated in nominal terms. Thus, growth in nominal wages and other incomes can lead to an increase in the average tax rate, all other things being equal. This means that, without a change in legislation, there is, for example, an erosion of the real value of deductible items, a shift to higher tax brackets and the associated taxation at a higher tax rate, etc. In our projection, however, we do not consider these and similar effects and assume that, for example, the real value of deductible items will be stable.
[69] Again, we are ignoring the effects caused by inflation (these would be particularly evident in the erosion of the real value of tax depreciation of firms' fixed capital or in the valuation of inventories).

we have taken into account in particular the demographic change of the groups to which state insurees belong (see subsection 3.2 for details). Recall that in the public sector, payments for the state insurees are both a revenue (for health insurance companies) and an expenditure (for the state budget). Thus, they do not affect the balance of the sector, but they are presented separately because they affect the data on the structure and size of the general government sector.

Taxation of consumption (**taxes on production and imports**) mainly includes revenues from value added tax and selective excise duties. The revenue of these taxes is simulated by the share of household final consumption expenditure in GDP, which is an approximation of the most important part of the tax base of consumption taxes. This does not change according to our macroeconomic projection (a change in the structure of pensions in favour of compensation of employees does not necessarily translate into a change in the structure of the use of pensions), so the yield of consumption taxes will also maintain a constant share of GDP.[70]

Property income includes mainly dividends and profit shares of state-owned enterprises. In this case again, we assume a stable share of GDP. At the same time, we do not expect the state to change its share in the major firms it (co-)owns. Overall, we therefore assume that the share of ownership income in GDP will remain constant at 0.6%.[71]

Other revenue comprises mainly revenue from the sale of goods and services and revenue from the EU. Given the way the Treasury operates, interest revenu on investment of surplus liqudity is not considered. The share of revenue from sales of goods and services in GDP is broadly stable and therefore fixed for the long-term projection. EU revenue is also assumed to represent a constant percentage of GDP. However, the evolution of this revenue is subject to a large degree of uncertainty, which further complicates its quantification. Although a short-term increase in these revenues can be expected given the energy and geopolitical situation, we have no information on a structural change in the long term. It should also be noted that our projection only includes EU revenue for the public sector, not total EU revenue for all entities in the Czech Republic, which is more likely to decline in the future given the convergence towards advanced economies.

Table 3.6.1 General government revenues in selected years (% of GDP)

	2023	2033	2043	2053	2063	2073
Personal income taxes	3.5	3.6	3.7	3.7	3.8	3.8
Corporate income taxes	3.7	3.4	3.2	3.0	2.9	2.8
Other current taxes	0.2	0.2	0.2	0.2	0.2	0.2
Social security contributions	15.8	16.1	16.3	16.5	16.5	16.5
pension insurance	*8.3*	*8.5*	*8.7*	*8.8*	*8.9*	*9.0*
public health insurance (excluding SIs)	*4.4*	*4.5*	*4.6*	*4.7*	*4.7*	*4.8*
payments for state insurees (SIs)	*1.9*	*1.8*	*1.8*	*1.8*	*1.6*	*1.5*
other	*1.2*	*1.2*	*1.3*	*1.3*	*1.3*	*1.3*
Taxes on production and imports	11.2	11.2	11.2	11.2	11.2	11.2
Property income	0.6	0.6	0.6	0.6	0.6	0.6
Other revenue	4.8	4.8	4.8	4.8	4.8	4.8
TOTAL REVENUE	39.8	39.9	40.0	40.1	40.0	39.9

Source: CFC calculations.
Note: totals in the table may be subject to inaccuracies due to rounding.

[70] Here again, we deviate slightly from strict compliance with the legislation because some excise duties are constructed in nominal amounts for a given quantity of goods. We therefore assume that legislation will change over the long term in such a way that the yield of this group of taxes will evolve as if they were all constructed as *ad valorem* taxes.
[71] This year's collection rate is actually 1.2%, but this is mainly due to the extraordinary dividend from CEZ, which cannot be expected repeatedly over a long period. The MF CR also envisages a collection rate of 0.6% in the longer term. See MF CR (April 2023) the Convergence Programme of the Czech Republic.

4 General government balance and debt

4.1 Primary balance

The projections of individual revenue and expenditure items allow for the projection of the general government primary balance (see Chart 4.2.1).

Our projections point to negative primary balances throughout the whole period under review. A significant trend of widening primary deficits has been evident since the mid-2030s. This is due to the expenditure side, which is increasing mainly for demographic reasons (pension, health care and care allowance expenditure). The increase in spending on education also played a role later on. According to the projection, the primary deficits will fall after 2060, because by then the baby-bust cohorts will have started to enter old-age retirement. Nevertheless, annual primary deficits will remain substantial until the end of the projection period. The revenue side of budgets will be broadly stable over the projection period and will not contribute to offset rising expenditure.

Chart 4.2.1 also shows that despite the improvement in primary balances after 2060 (for demographic reasons), overall balances will continue to deteriorate. This is because high primary deficits, especially between the 2030s and the 2050s, will lead to an increase in public debt with a concomitant significant increase in interest costs (see Table 4.2.1). However, debt-servicing costs will not disappear with the subsequent improvement in primary balances and will "crowd out" this improvement in primary balances in terms of their size.

4.2 Interest costs and total balance

For a complete picture of the evolution of the general government balance, the trajectory of primary balances must be supplemented by the interest cost of general government debt (see Chart 4.2.1 and Table 4.2.1). Until now, we have expressed both expenditure and revenue items as a ratio of GDP, and the inflation rate has thus been irrelevant to this expression. However, this is no longer possible in the case of interest costs. Interest costs are generally determined by the nominal interest rate, which already incorporates the inflation rate. The nominal interest rate is approximately the sum of the real interest rate and the inflation rate, while the real interest rate is itself determined by real factors such as the marginal productivity of capital or the time preferences of economic agents. Thus, the long-term inflation rate, via nominal interest rates, affects the share of interest costs in GDP, and hence the overall size of the share of public sector spending in GDP. In our projection of nominal interest costs, we assume 2% inflation, which corresponds to the midpoint of the central bank's target band.

In our context, public sector debt is predominantly made up of government debt (more than 90% in the long term), which is the focus of our projection. Interest costs on the remaining part of public sector debt (e.g. municipal debt) will be assumed to behave similarly.

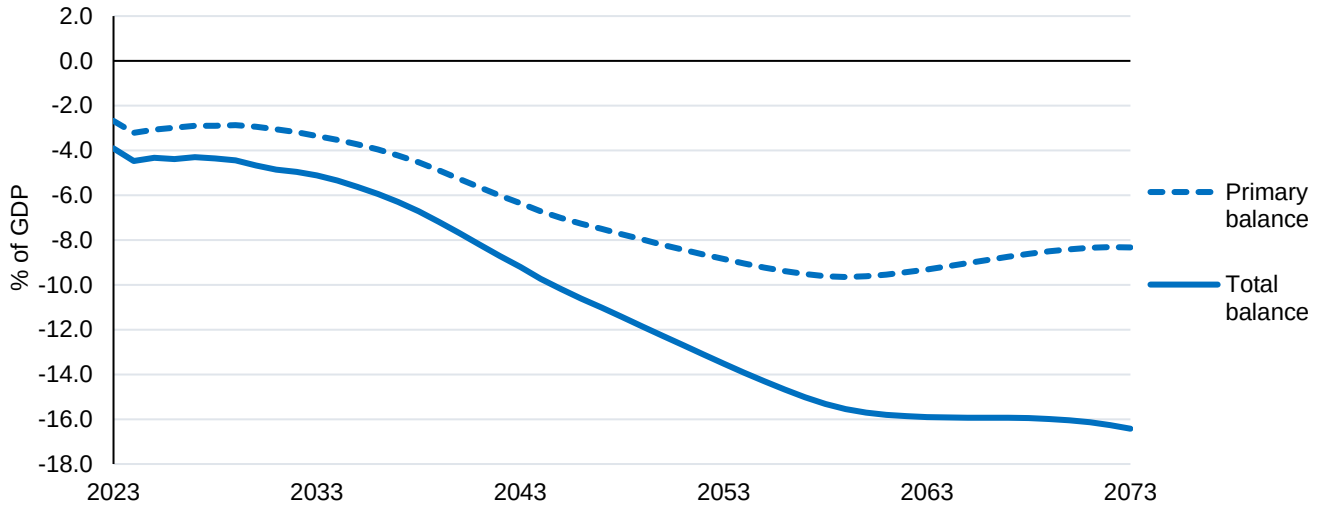
In reality, sovereign debt is financed by a range of instruments from non-marketable borrowings to a wide variety of debt securities with different maturities, coupon yields and denominations.[72] In the projection, we are therefore forced to simplify and divide the total debt of the general government sector into two parts: short-term debt (i.e. debt maturing within one year) and long-term debt. For the short-term part of the debt, we assume that it is financed at a short-term rate and has to be refinanced every year at the current rate. In contrast, for the long-term part of the debt, we assume that it is financed by bonds with an original maturity of 10 years and a coupon that corresponds to a 10-year nominal interest rate (the 10-year maturity was chosen because it is the longest maturity for which we have a sufficiently long time series that is also internationally comparable). We keep the share of short-term debt in total debt constant at 10% and the share of long-term debt constant at 90%. We base the ratios on both past empirical evidence and the MF CR's forecast for future years[73]. Let us add that due to refinancing risk, the level of 20% represents the maximum allowable limit for the share of short-term debt. [74]

We model the total interest cost as the product of the general government debt and the so-called implicit nominal interest rate, which is the weighted average of the nominal interest rates paid on the short-term

[72] For more details, see MF CR (2023): Report on the Management of the State Debt of the Czech Republic in 2022 and Morda (2022): Vývoj státního dluhu České republiky (2. aktualizované vydání) [Evolution of the State Debt of the Czech Republic (2nd updated edition), available in Czech only].
[73] See e.g. MF CR (April 2023): The Convergence Programme of the Czech Republic.
[74] See MF CR (2023): Strategy for the Financing and Management of the State Debt of the Czech Republic 2023.

and long-term portions of the debt. The weight of the short-term interest rate on the implicit interest rate is the same as the share of short-term debt, i.e. 10%. The short-term interest rate will be held constant in our projection at 1.8% p.a. This corresponds to a real short-term interest rate of –0.2% p.a. (this was the average real three-month interest rate between 2002 and 2022[75]) plus 2% inflation. The interest rate on the long-term portion of the debt has an analogous 90% weight on the implicit interest rate. But here, for simplicity, we assume that the interest rate on the long-term portion of the debt is equal to the 10-year moving average of 10-year interest rates in each year. In doing so, we take into account the fact that the current interest rate is not relevant for the servicing costs of already issued 10-year bonds, but only the interest rate at the time of issuance. Furthermore, we assume that the 10-year nominal interest rate converges to 2.8% p.a. in the baseline scenario, the real interest rate (again, the average for the years 2002 to 2022) is 0.8% and the rest is the 2% expected inflation rate. Taken together, the assumptions chosen lead to the modelled implicit interest rate rising gradually to 3% p.a. by 2031.

Chart 4.2.1 Primary and total general government balance (baseline scenario)



Source: CFC calculations.

Table 4.2.1 Interest costs and budget balances (% of GDP) in selected years

	2023	2033	2043	2053	2063	2073
Interest costs (baseline scenario)	1.2	1.8	2.8	4.7	6.6	8.1
Total balance (baseline scenario)	-3.9	-5.1	-9.2	-13.5	-15.9	-16.4

Source: CFC calculations.

4.3 Debt

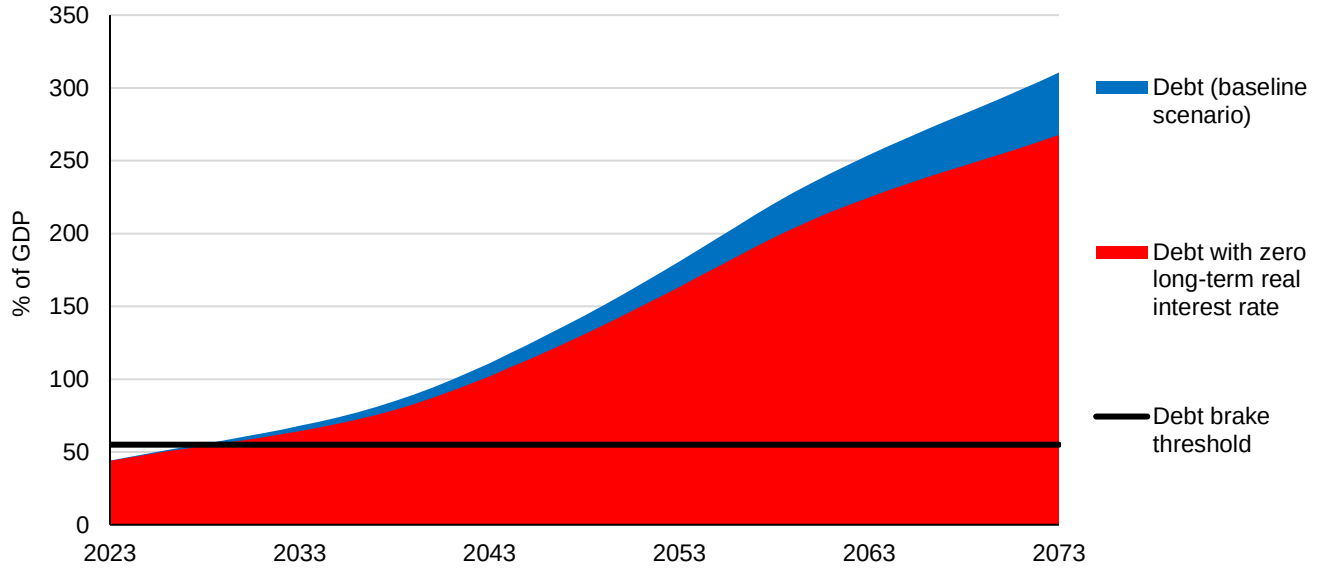
On the expenditure side, interest costs enter into the calculation of the overall general government balance and thus deepen annual deficits. They accumulate in the general government debt, and the increasing debt generates a further increase in interest costs (see Table 4.2.1 for data for selected years). The cumulated public sector debt tends to a level of around 311% of GDP in 2073 over a 50-year horizon (the so-called baseline scenario). This evolution is mainly driven by the evolution of primary balances, not by our interest cost model, because even if we (unrealistically) assume that long-term real interest rates are zero throughout the projection period, the debt would be heading towards around 268% of GDP (see Chart 4.3.1).

In addition to this version of the interest cost projection, we also perform an alternative projection with interest rate feedback in which we také into account the relationship between the level of debt relative to GDP on the one hand and the level of interest on the other. In the simulation, we consider that each percentage point of the debt-to-GDP ratio above the 55% threshold increases the current 10-year real interest rate by 0.039 pp[76] Under these assumptions, debt growth would be accelerated compared to the baseline scenario from 2028

[75] Nominal interest rates were taken from CNB data, the conversion to real interest rates was made using the GDP deflator from CZSO data.
[76] For an estimate of the risk premium, see Tománková (2020): The Effect of General Government Debt on Government Bond Interest Rates.

onwards, when our projection suggests that debt exceeds the debt brake. In 2039, debt would become unsustainable and the Czech Republic would be in a debt trap as the implicit interest rate would exceed the growth rate of nominal GDP.

Chart 4.3.1 General government debt



Source: CFC calculations.

4.4 Public finance sustainability indicator

As an aggregate indicator of the sustainability or unsustainability of public finances, the S1 indicator is used, which is generally defined as the number of percentages of GDP by which the primary structural balance must change (by the same number of percentages of GDP in each year) over the entire pre-selected period for the debt to reach a pre-specified value at the end of that period.[77]

So in our case, we choose a 50-year period and ask by how much percent of GDP would the primary balance have to be better than our projection each year for the general government debt to be at 55% of GDP at the end of the projection period, i.e. at the debt brake level. Constructed in this way, the S1 indicator captures the sustainability gap in public finances. Let us stress, however, that this is an indicator whose main purpose is to allow a quick comparison in the future as to whether the sustainability of public finances is improving or deteriorating. On the contrary, it is not a recommendation that the balance should actually improve by a given value each year.

According to our simulation, the public finance sustainability gap is now 6.22 (it was 6.04 in 2022 and 6.98 in 2021). This implies that if the primary deficit were 6.22% of GDP lower each year starting in 2023 throughout the projection period, debt would be heading towards 55% of GDP in 2073. Since in this case the debt trajectory would never exceed the debt brake, there would also be no feedback between interest and debt.

If measures to reduce the long-term imbalances in public finances are delayed, the magnitude of adjustments in tax and expenditure policies to ensure that debt does not exceed 55% of GDP in 2073 will have to be more substantial than the value of the sustainability gap indicator presented above. If the solutions are delayed until the debt limit is reached (i.e. projected to 2028), the indicator will rise to 6.88.[78]

Note that a similar indicator is being constructed by the European Commission. However, instead of using a 50-year projection period, it works with an infinite horizon and expresses the fiscal effort required to make discounted revenues and expenditures equal over an infinite horizon. This is the S2 indicator, which gives a value of 5.5 for the Czech Republic in 2022.[79]

[77] For a more detailed description, see European Commission (2023): Debt Sustainability Monitor 2022.
[78] So, for the debt to be on track to reach 55% of GDP in 2073, the primary deficit would have to be 6.88% of GDP lower each year from 2029 to 2073.
[79] European Commission (2023): Debt Sustainability Monitor 2022.

5 Alternative scenarios and additional analyses

The baseline scenario of our projection used in the previous chapters was calculated assuming that the adjusted medium variant of the CZSO's demographic projection would be met and that the current tax and expenditure policy settings would be maintained. In order to illustrate at least partly the possible deviations from our baseline scenario, which can generally be significant for long-term projections, we have constructed a set of alternative scenarios, which are described in more detail below. The first three alternative scenarios are constructed for the medium variant of the demographic projection, considering the effects of the public finance reform[80] both with respect to the revenue side of the budget (subsection 5.1) and with respect to adjustments to the parameters of the pension system (subsections 5.2 and 5.3). The various parts of the public finance reform are at different stages of the legislative process, with the implementation of some of them more or less certain, while others may still be subject to changes and their settings are for the time being only illustrative (see Box 5.1 for a more detailed description of the proposed changes). The scenario in subsection 5.4 then combines the first three alternative scenarios and the alternative scenario in subsection 5.5 seeks to illustrate the impacts of different assumptions on demographic developments. Subchapter 5.6 illustrates the impact of changes in public finances and pensions on individual generations (generational accounts). Chapter 5 concludes with a comparison with last year's Long-Term Sustainability Report.

5.1 Revenue measures of the consolidation package

The projection in this scenario is based on the Bill on the Consolidation of Public Budgets, which was presented in May 2022. It is an amendment to 63 laws and is a key output of the governing coalition to reduce the structural deficit of public finances.

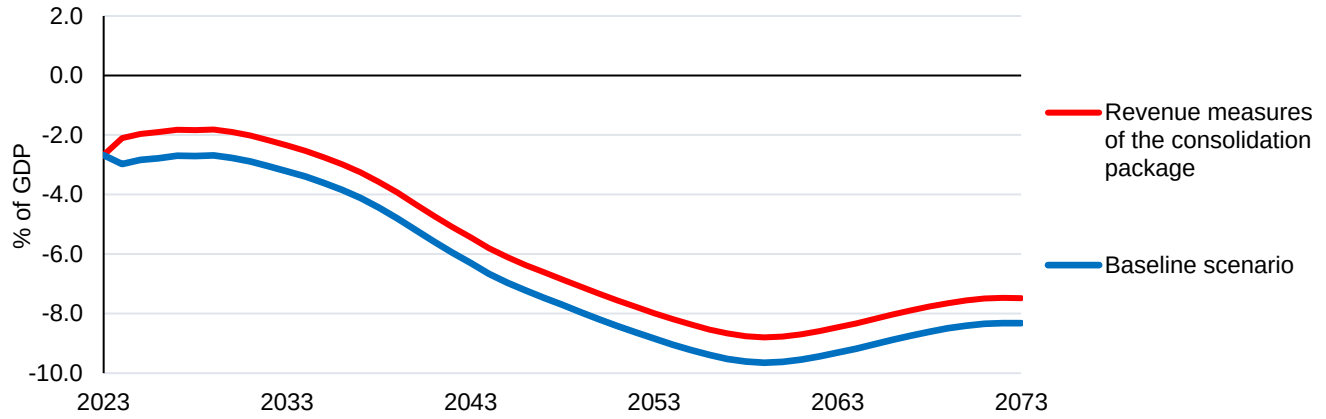
This scenario includes only measures that require a legislative solution in the form of a change in the law (i.e. only revenue measures of the so-called consolidation package are included)[81]. However, in addition to revenue measures, expenditure measures are also an integral part of the consolidation of public finances[82]. However, expenditure measures are not included in this scenario because their implementation does not require a legislative change and is only an executive decision of individual ministries. Moreover, the precise parameters of expenditure savings (e.g. cancellation of specific subsidy titles) have not been announced in sufficient detail to date, and their sustainability over time is also an issue. Thus, the simulation presented here only shows the effects of the increase in the revenue side of public budgets included in the package if it were held for the whole period of analysis.

The primary balance is 0.85–0.88% of GDP better than in the baseline scenario each year over the entire projection period (see Chart 5.1.1).

The improvement is also reflected by a decline in the sustainability indicator from 6.22 to 5.38. However, despite the revenue measures of the consolidation package, the general government balance would still be in significant deficit, but this is a relatively significant improvement, especially in the short term. In the long term, the deterioration in public finances is driven predominantly by demographic change, and the increase in the revenue side only mitigates its impact to a limited extent.

[80] The term "public finance reform" in our Long-Term Sustainability Report refers to the joint implementation of three scenarios (subsections 5.1, 5.2 and 5.3).
[81] The expenditure measure "reduction of state support for building society savings accounts" also requires a legislative change, but due to its relatively small fiscal impact we do not include it.
[82] Furthermore, the measures collectively referred to as pension reform are not part of this scenario. These measures also form a substantial part of the government's consolidation efforts, especially in the long term. However, in our Long-Term Sustainability Report, we address parametric adjustments to the pension system in separate scenarios (see scenarios in subsections 5.2 and 5.3).

Chart 5.1.1 General government primary balance – revenue measures of the consolidation package



Source: the MF CR (2023); CFC calculations.

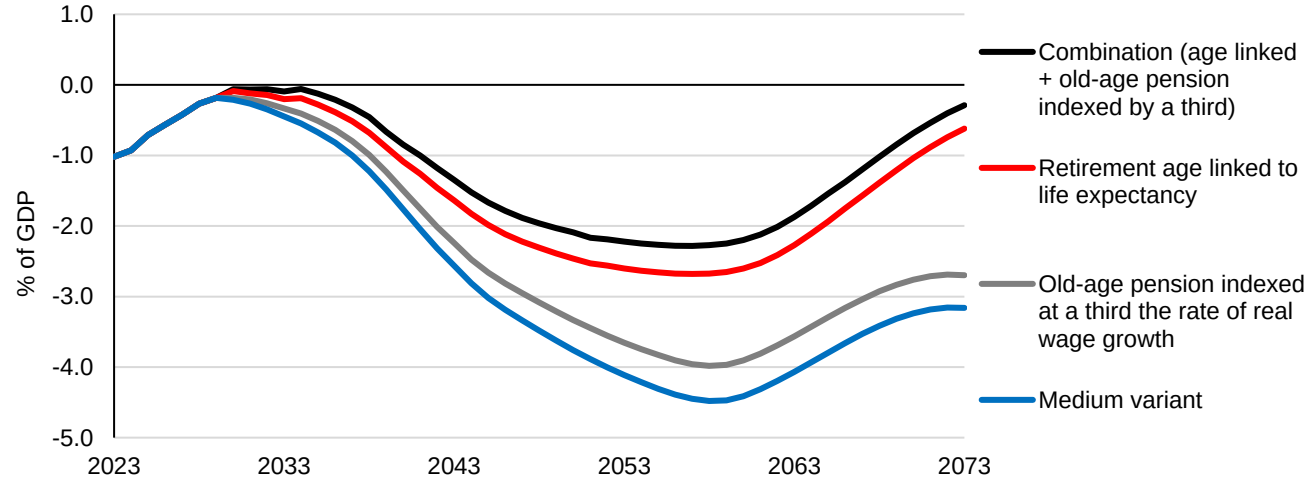
5.2 Adjustment of pension indexation

Another alternative scenario relates to the adjustment of the method of pension indexation. In July 2023, the Chamber of Deputies of the Parliament of the Czech Republic (the Chamber of Deputies) approved a government bill amending the Pension Insurance Act. Among other things, the amendment provides for the indexation of pensions in both statutory and extraordinary terms (see also Box 5.1). In our projection, we mainly consider changes in the regular valorisation (the so-called "statutory valorisation", see also subsection 3.1 and Box 3.1 for the method of valorisation), as we assume compliance with the CNB's 2% inflation target in the long run, so that the conditions for extraordinary valorisation (5% price growth) will not be triggered.

At regular intervals, i.e. always in January of the year in question, pensions are increased in line with inflation and real wage growth. The regular inflation adjustment remains almost unchanged in the draft amendment to the Pension Insurance Act. The only change is that, whereas previously pensions were increased according to either the consumer price index or the pensioners' cost-of-living index, whichever was higher, pensions will now only be increased according to the pensioners' cost-of-living index. The increase in this index tends to be higher than the increase in consumer prices (on average 0.4 pp year-on-year), so this change does not affect our projection.

A more fundamental change in the indexation rule is likely to occur in the part linked to real wage growth. The indexation rule that applied before 2018 should return, so that pensions will only increase by a third of real wage growth instead of the current half of real wage growth. This change will naturally lead to lower replacement rates and lower pension system deficits (see Chart 5.2.1).

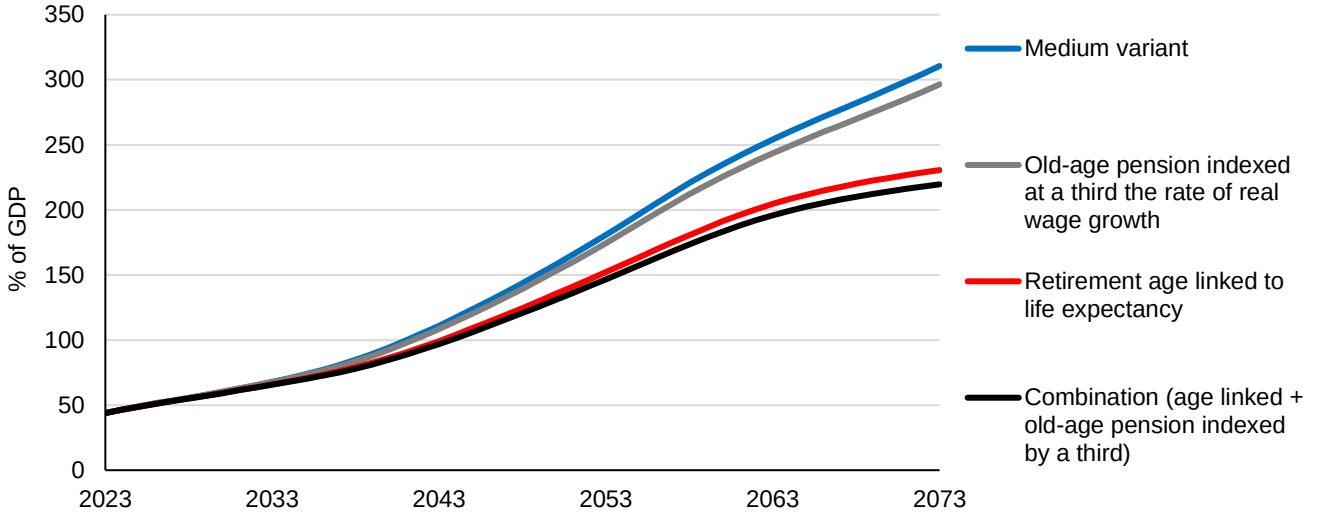
Chart 5.2.1 Annual balances of the pension system – comparison of alternative scenarios with the medium variant



Source: CZSO (2023), CSSA (2023); CFC calculations.

Given the significant decline in real wages in 2022 and 2023 and the fact that further indexation of pensions to real wage growth will only occur when real wages exceed their 2021 level[83], the effect of this change will only start to become apparent after 2030. In the medium variant, this change will lead to a reduction in pension deficits after 2050 by around 0.5 pp of GDP, while in the variable retirement age scenario the impact will be slightly lower (0.4 pp). In both these cases, lower pension deficits are reflected in lower debt dynamics, with the debt-to-GDP ratio falling by 14 pp at the end of the projection in 2073 (see Chart 5.2.2).

Chart 5.2.2 General government debt – comparison of alternative scenarios with the medium variant



Source: CZSO (2023), CSSA (2023); CFC calculations.

5.3 Linking of the retirement age to life expectancy

The pension reform also includes an adjustment of the retirement age beyond the current 65 years. Under the current proposal, this change would affect people born after 1965, with the limit gradually increasing as life expectancy increases. The CZSO's life expectancy at age 50 (life expectancy) will be used to determine the retirement age. The retirement age should be set so that the time spent in retirement remains the same for future generations, i.e. approximately 21.5 years. The retirement age will be allowed to change by a maximum of two months between two consecutive, i.e. slower than the current rate of increase in the retirement age. If life expectancy does not continue to increase, the increase in the retirement age will stop.[84]

A certain problem with the new mechanism for determining the retirement age is that according to it, only people over 50 years of age, for whom statistics on their life expectancy are available, know their retirement age. It is also unclear from the current proposal how it will build on the already existing regulation linking retirement age to life expectancy under Section 4(a) of Act No. 582/1991 Coll, According to this current regulation, the retirement age (the same for men and women) would be set so that for those who reach it, their life expectancy (i.e. the time they spend in old-age pension) would be one quarter of their total life expectancy. The updating of the retirement age under Section 4(a) of the Social Security Act always occurs immediately after the publication of a new demographic forecast[85], and thus occurs at the end of 2023. To simulate the alternative scenario, we used the CZSO projection of the retirement age, which we extended further to allow us to project to the end of our projection period (i.e., 2073). For the 1965 to 1971 cohorts (i.e. for the years 2030 to 2037) we assume their retirement age according to the new proposal of the Ministry of Labour and Social Affairs of the Czech Republic (MoLSA), for the 1972 to 1974 cohorts we consider a constant retirement age of 65 years and 7 months. For those born in 1975 and later, we assume their retirement age according to Section 4(a) of the Social Security Act (i.e. the current

[83] According to estimates, this should happen in 2028, so indexation to real wages will begin in January 2030.
[84] Thus, under these rules, the retirement age would increase to 65 years and 2 months for those born in 1966, 65 years and 4 months for those born in 1967, 65 years and 5 months for those born in 1968, and 65 years and 7 months for those born between 1969 and 1971. These retirement ages are about 2–6 months higher than would correspond to the current version of linking pension age to life expectancy under Article 4(a) of Act No 582/1991 Coll., on the Organisation and Implementation of Social Security, as amended.
[85] See CZSO (2018): Report on the expected development of mortality, fertility and migration in the Czech Republic. [Zpráva o očekávaném vývoji úmrtnosti, plodnosti a migrace v České republice; available in Czech only]

version of linking retirement age to life expectancy). From 2040 onwards, there would then be a further gradual increase in the retirement age up to the level of 68 years at the end of the projection.

The gradual increase in the statutory retirement age is projected to contribute to lower deficits and lower debt through several channels. First, it will slightly increase the projected level of GDP as the number of workers in the economy gradually increases due to later retirements (by about 5% at the end of the projection compared with the baseline scenario).[86] Proportionally, this will lead to an increase in public sector revenue. However, the main change will be on the expenditure side of public budgets. Within the pension system, while expenditure on disability pensions will increase slightly and the average old-age pension will rise due to the increase in the insurance period, the increase in the retirement age will mainly be reflected in a decrease in the number of old-age pensions paid, leading to lower expenditure on them. Thus, the number of old-age pensioners in 2073 will be 13% lower than in the baseline scenario and total expenditure on old-age pensions will be 12.7% lower. Widows' and widowers' pensions will also fall less than in the baseline scenario, with the decline in the number of combined pensions outweighing the slight increase in solo widows' and widowers' pensions. The pension balance improves by around 1.0–2.5% of GDP from 2045 to the end of the projection due to the gradual increase in the retirement age (see Chart 5.2.1). The reduction in pension system deficits leads to a corresponding reduction in primary structural deficits and, together with a slightly higher level of GDP and lower interest payments, results in a debt level that is 80% of GDP lower than in the baseline scenario by 2073 (see Chart 5.2.2). If the increase in the retirement age above 65 is combined with a one-third indexation of pensions to real wage growth, the debt level would be as much as 91% of GDP lower. This is therefore a scenario with a significant positive impact on the future debt level.

Box 5.1 Pension reform parameters

During 2022 and 2023, work was carried out to prepare the pension reform. The parameters of this pension reform were discussed by the Pension Reform Advisory Team (the "Pension Commission"), which met for the first time in April 2022. Some of the changes proposed by the Pension Commission or the MoLSA have already reached relatively advanced stages of the legislative process and their application is almost certain (for example, the adjustment of pension indexation and the tightening of the conditions for early retirement were already approved by the Parliament of the Czech Republic in June 2023[87]), while others have not yet been approved.

The scope of the proposed changes is quite significant and, although they are mostly parametric changes to the pension system, most of them should contribute to increasing the stability of the pension system and public finances as a whole. Two of the proposed changes (reducing the indexation of pensions from one half to one third of real wage growth and linking the retirement age to life expectancy) are the subject of alternative scenarios in this Long-Term Sustainability Report (subchapters 5.2 and 5.3). This box also provides an overview and a brief assessment of the other changes as well.

Adjustments to the indexation mechanism

As already discussed in subsection 5.2 of this Long-Term Sustainability Report, a rather significant change is the adjustment of the indexation mechanism in both the regular (statutory) and extraordinary terms. The main change to the regular pension indexation method is the reduction of the real wage growth offset from one half to one third. There will also be a change in which pensions are exceptionally increased in the event of high price rises (when price rises since the last indexation exceed the 5% threshold). Instead of an exceptional indexation, where only a earnings-related part of the pension was increased in the event of high price rises, an exceptional and temporary allowance will be paid until the next indexation in due course. 60% of the observed price increase will be taken into account when determining the temporary pension supplement and the increase of the earnings-related part of the pension, half of which will be reflected in an amount that is the same for all pensioners and the other half will be reflected in a earnings-related part specific to each pensioner. When the temporary allowance ceases to be paid, pensions are increased from 1 January of the following calendar year. The introduction of the temporary allowance, compared to the current method of exceptional indexation, will lead to a greater levelling out of the differences in pension growth (low pensions will grow more in percentage terms than high pensions). At the same time, the cost to the pension system will be reduced in a year of high price growth, but this will be offset by higher pension growth in the subsequent regular indexation.

[86] The increase in the number of workers will occur even though some of those forced to retire later because of the increase in the retirement age will move to disability retirement before reaching their retirement age.
[87] Parliamentary Print 458/0, Government Bill amending Act No. 155/1995 Coll., on Pension Insurance, as amended.

Tightening up on early retirement pensions

Due to the increasing use of early retirement, which also negatively affects the stability of the pension system, there have been several tightenings in this area. The period for early retirement has been reduced from the current 5 years to 3 years before the standard retirement age. A new condition for early retirement will be the completition of a minimum of 40 years of insurance (including non-work validated periods; increased from the current 35 years). There is also an increase in the pension reduction coefficient for early retirement, especially for early retirement within one year of normal retirement age.[88] The advantage of early retirement is also reduced by limiting the indexation of the percentage of these pensions to the standard retirement age. In contrast, employees who have completed 45 years of service should be able to take early retirement under more favourable conditions (halving their early retirement pension).

Adjustment of the retirement age and changes in the way income is taken into account for newly granted pensions

As already mentioned in subsection 5.3 of this Long-term Sustainability Report, one adjustment that helps to increase the stability of the pension system is to raise the retirement age. Higher retirement ages lead to longer labour market participation and insurance periods, which under current conditions would lead to average new pensions growing faster than average wages. To avoid this, the parameters for calculating new pensions will be gradually adjusted. There will be a combination of a reduction in the crediting of earnings up to the first reduction threshold (44% of the average wage) to the calculation base from the current 100% and a gradual reduction in the percentage of the calculation base crediting for each year (a reduction of a few hundredths of a percentage point from the current 1.5%). Our projections already assume the stability of the replacement rate for newly granted pensions, which is consistent with the implementation of this change.

Expanding the range of people in demanding professions

The range of so-called demanding professions should be expanded, allowing people in these professions to retire up to five years earlier than the statutory retirement age and without having their pensions reduced. The reduced retirement age currently applies only to underground miners, and will now be extended to paramedics and company firefighters. Eligibility for the reduced retirement age should depend on the total number of shifts worked in high-risk work, with the retirement age reduced by one year for every ten years worked in high-risk work. All shifts worked since 2001 recorded in the register should also be counted retroactively. According to the register of work categorisation maintained by the Institute of Health Information and Statistics of the Czech Republic, the number of exposed employees in categories 3 and 4 will exceed 500,000 by mid-2023, i.e. approximately 9.4% of the workforce. Unfortunately, there is no data to show how long these workers have spent in demanding occupations and what their exact retirement age would be. If all these workers have been counted and it is assumed that they have spent an average of 20 years in a demanding occupation, this change could be equivalent to a reduction in the retirement age of about 2.5 months, or up to half of the total increase in retirement age after 2030. This could reduce the positive deficit effects of raising the retirement age calculated in subsection 5.3. However, as the increased social security rate will only apply to new entrants in demanding occupations, while the retirement age will be reduced retroactively, this dampening effect will be negligible.

Increase in the guaranteed pension amount

One of the MoLSA's proposals, which follows the conclusions of the previous Fair Pensions Commission, is to increase the minimum (guaranteed) amount of the pension. The current basic flat-rate part of 10% of the average wage should be maintained, while the minimum earnings-related part should be increased from CZK 770 to 10% of the average wage. The new minimum pension would thus amount to CZK 8,080 at the basic flat-rate part in 2023, whereas it is currently only CZK 4,810. This increase in the minimum pension by roughly two-thirds would affect pensioners with the lowest pensions (roughly 0.2% of all pensioners). The overall fiscal cost should therefore be relatively low.

5.4 Overall impact of the public finance reform

The projection in this scenario is based on the simultaneous implementation of all three previous scenarios simultaneously, i.e. the retirement age will be linked to life expectancy, the calculation of the indexation of pension insurance benefits will be based on one-third of real wage growth instead of half, and the revenue measures of the so-called consolidation package will be implemented.

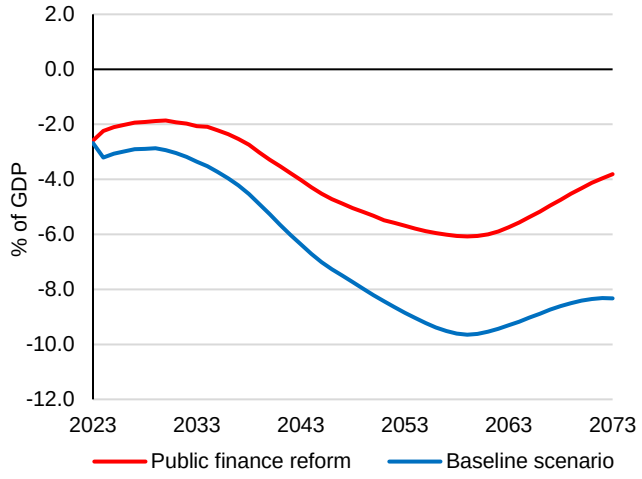
This scenario represents a dramatic improvement over the baseline scenario in all relevant indicators related to the sustainability of public finances. In the 2050s, when public finances fall into their deepest deficits, the primary balance improves by more than

[88] The early retirement pension will be reduced by 1.5% of the calculation base for every 90 days before normal retirement, compared to 0.9% from 0 to 360 calendar days.

3% of GDP per year (Chart 5.4.1) and the annual general government deficit improves by almost 8% of GDP over the projection period (Chart 5.4.2). The S1 indicator decreases from 6.22 to 3.42.

This significant improvement is mainly due to the fact that each of the three adjustments under this scenario operates in a different projection period.

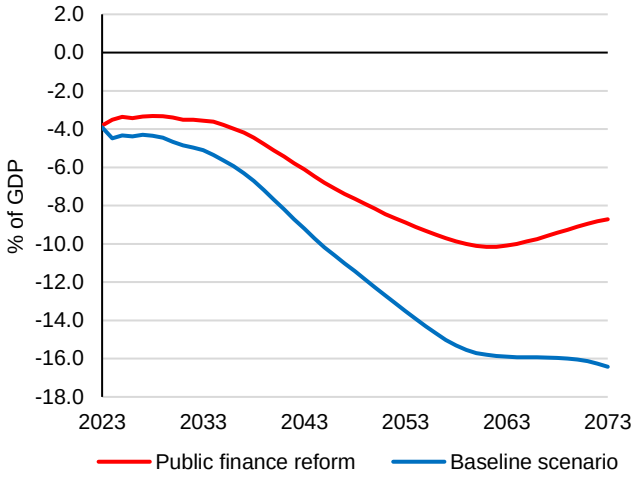
Chart 5.4.1 General government primary balance – baseline scenario and public finance reform



Source: CZSO (2023), CSSA(2023), MF CR (2023); CFC calculations.

While the revenue measures of the consolidation package have an impact mainly in the short and medium term, the parametric changes to the pension system (adjustments to the indexation formula and retirement age) have an impact in the medium and long term. Thus, the joint implementation of all three scenarios dramatically improves the performance of the public sector over the entire projection period.

Chart 5.4.2 General government balance – baseline scenario and public finance reform



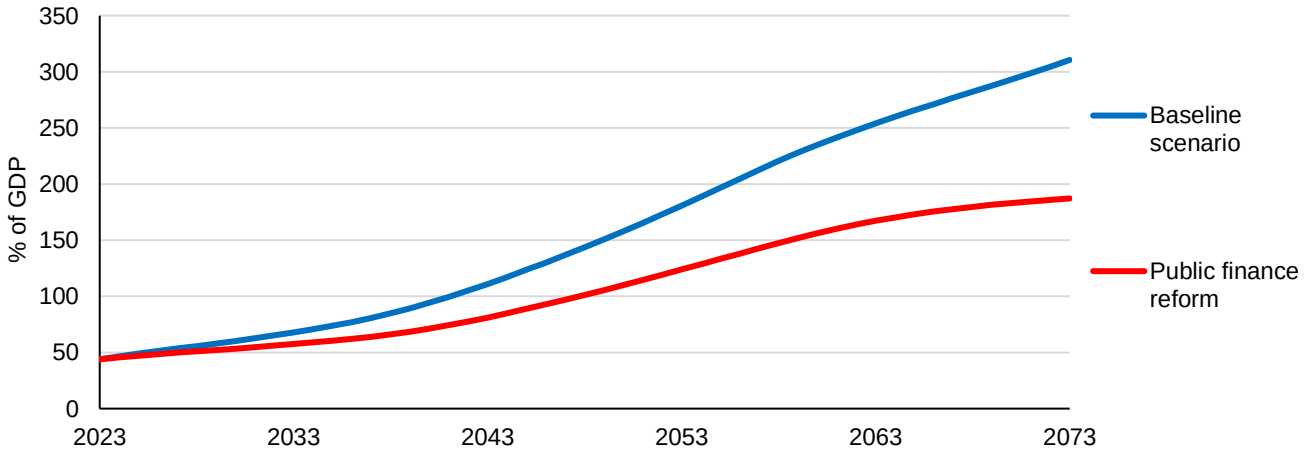
Source: CZSO (2023), CSSA(2023), MF CR (2023); CFC calculations.

Recall that in the baseline scenario, despite an improvement in primary balances after 2060 (for demographic reasons), overall balances would continue to deteriorate (see Chart 5.4.2 or 4.2.1). However, in the alternative scenario with public finance reform, overall balances improve after 2060. This is mainly because better primary balances over the whole period under consideration will lead to lower debt servicing costs and improved primary balances after 2060 can "crowd out" interest costs.

Total debt is 123% of GDP better off at the projection period (2073), see Chart 5.4.3.

We consider it absolutely crucial to point out that the improvements seen in this scenario require not only the implementation, but more importantly the maintenance of all measures taken throughout the period. Obviously, the significant impact of the improvement in public finances would almost disappear if the measures adopted were to be further weakened or even reversed.

Chart 5.4.3 General government debt – baseline scenario and public finance reform

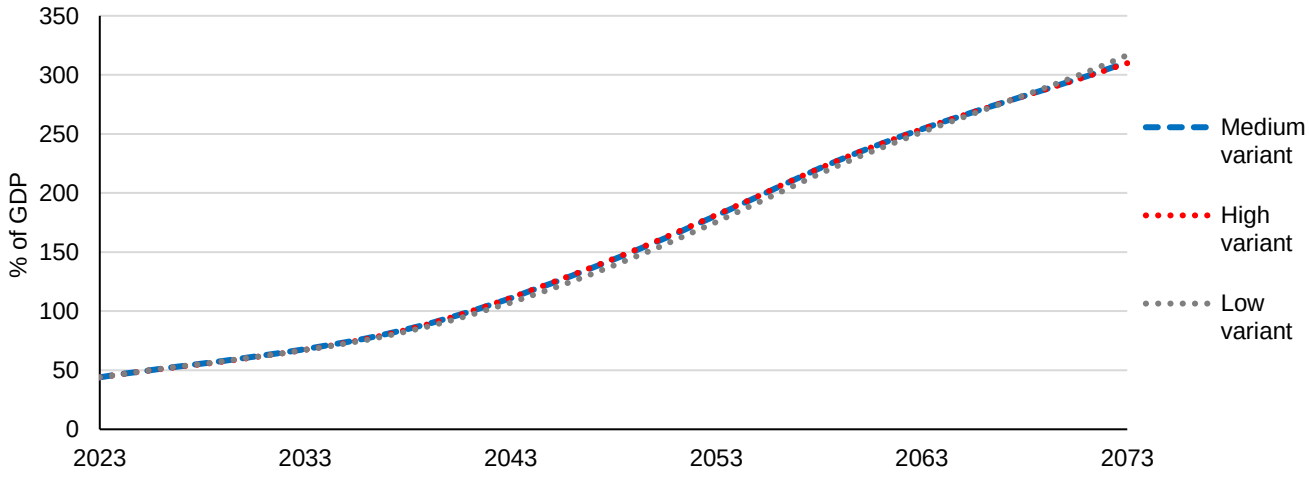


Source: CZSO (2023), CSSA (2023), MF CR (2023); CFC calculations.

5.5 Different variants of demographic projections

Other scenarios illustrate the sensitivity of our projections to different assumptions about demographic developments. The different demographic scenarios differ from each other both in terms of different population sizes and age structures. Although the overall population size is quite different in the different demographic projection scenarios,[89] the medium, high and low variants are very similar in terms of the age structure of the population they project. The ratio between the number of people of working age (for our purposes aged 21 to 64 inclusive) and the number of people aged 65 and over is similar in all variants. The similarity in population structure for these demographic variants is due to opposing mechanisms within these demographic variants. For example, the low demographic variant has a lower fertility rate and a lower migration rate in the low demographic variant compared to the medium demographic variant, causing a decline in the ratio of the working age population to the population over 65 years of age. However, the higher mortality rate and lower life expectancy in this demographic variant increases this ratio. As a result, the medium, high and low demographic variants generate similar projections of the debt-to-GDP ratio (see Chart 5.5.1). However, the CZSO will publish a new demographic forecast (including alternatives) at the end of 2023, which may change significantly due to the materialisation of the shocks of recent years (in particular, increased mortality due to the COVID-19 pandemic and increased migration due to the war in Ukraine; see subsection 2.2. However, even with the new demographic projections, there will be many uncertainties, such as assumptions about the rate of repatriation of war refugees or how the increased mortality rates during the COVID-19 pandemic will translate into long-term life expectancy projections. However, even for the combination of demographic projection parameters from each scenario that maximises revenues and minimises expenditures, the projected pension deficits in 2055–2073 are only about one pp of GDP lower than in our baseline scenario.[90]

Chart 5.5.1 General government debt – comparison of different variants of the demographic projection



Source: CZSO (2023), CSSA (2023), MF CR (2023); CFC calculations.

5.6 Generational accounts in the pension system

5.6.1 Generation-specific expenditure and revenue

In this subsection, we look at generation-specific expenditures and revenues in each year to show the distribution of the fiscal burden across generations.[91] The largest generation-specific item is pension revenues and expenditures, which we discuss in more detail in the following subsection. The consequences of an ageing population and the entry of baby-bust cohorts into the labour force do not only

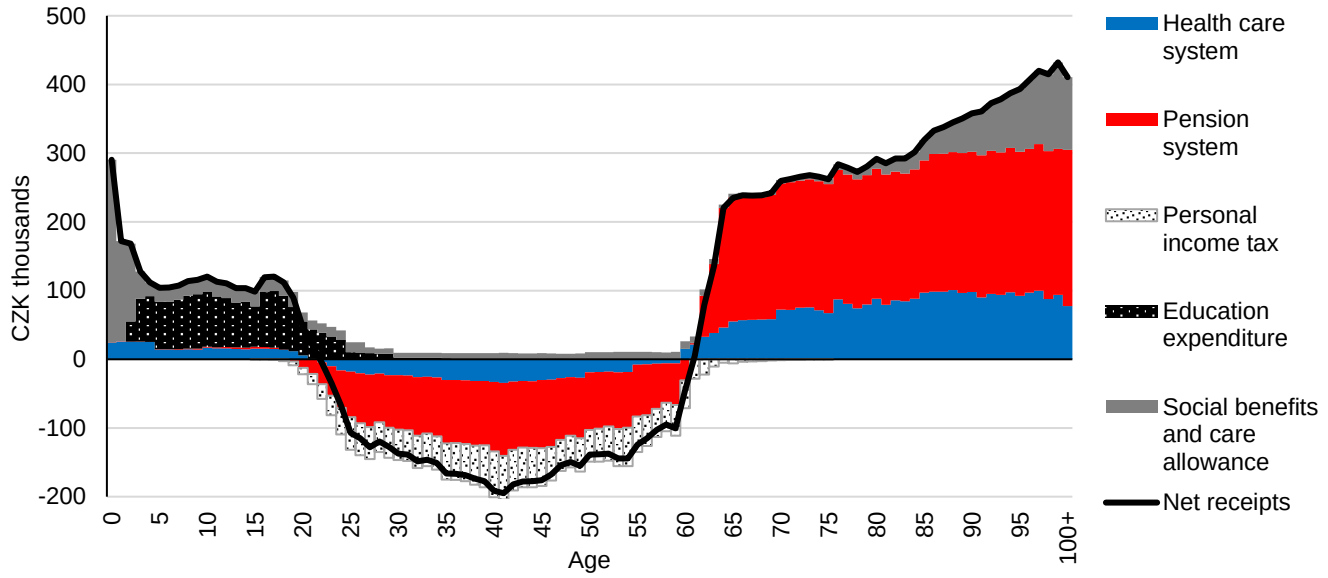
[89] While in the adjusted medium variant of the demographic projection the population is basically stable at the projection period at around 10.5 to 10.7 million inhabitants, in the low variant it decreases to 8.7 million inhabitants in 2073, while in the high variant it increases to 11.5 million inhabitants in the same year.
[90] See the OCFC information study – Hlaváček, Junicke (2021): Alternativní demografická projekce [Alternative Demographic Projections, available in Czech only].
[91] For the methodology of generational accounts, see OCFC (2021): Metodika mezigeneračních účtů [Generational Accounting Methodology, available in Czech only]. Also see Box 6.1 in the 2021 Long-Term Sustainability Report.

affect the pension system itself, but are also reflected in health care expenditure or generation-specific social benefits. We consider around 41% of total revenues and 45% of total public expenditure in 2021 to be generation-specific.

Chart 5.6.1 shows the age profile of revenue and expenditure per person of a given age. It shows that children in the first three years of life are the net recipients of benefits, mainly due to maternity and parental leave as well as increased health costs. From age two onwards, schooling benefits are gradually added and dominate until about age 18. Child/student-linked personal income tax discounts which are also considered to be a social benefit and which we assign to children, are also significant.

Working-age people, on the other hand, are on average net contributors, with their contributions to the system in the form of income taxes and health and social security contributions exceeding the benefits that these generations draw from the system. The post-working age generations are again net beneficiaries, with the largest gains from the pension and health care systems. Thus, on average, the current net contributor to public budgets is a person aged between 22 and 60.

Chart 5.6.1 Payments and receipts per person of a given age in 2021



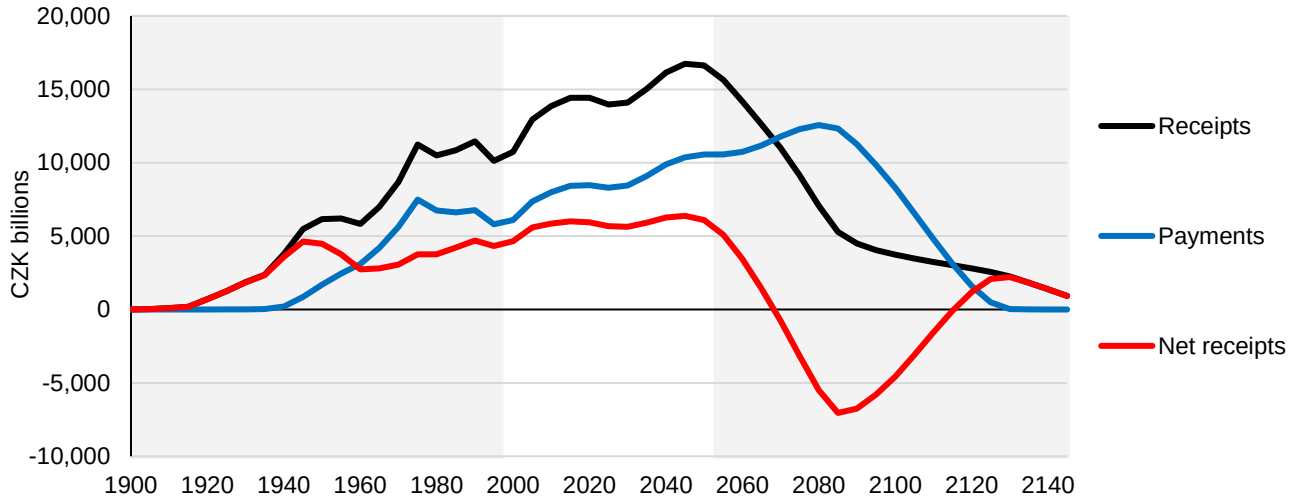
Source: CZSO (2023), CSSA (2023); CFC calculations.

The generational accounts also show that the average person born between 2000 and 2004 (i.e. the first generation for which we project their entire life cycle) will receive CZK 10.2 million more from public budgets than they will contribute to them over their lifetime. However, each member of the generation born 50 years later will receive CZK 11.7 million more than they will contribute if policies remain uchanged.[92] As shown in Chart 5.6.2, the generations born up to 2065 are net beneficiaries of the public finance system in our projection. The generations born later are still economically active in the period we have defined, but their entire retirement period is not covered. Overall, therefore, they are net contributors. However, in the long run, i.e. after 2150, even this generation would become net beneficiaries under unchanged policies.

Chart 5.6.3 shows how net receipts of each generation would change under the assumption of a higher tax rate, with public sector debt remaining at the debt-brake level (55% of GDP) until 2073. This assumes that the increase in the tax burden would occur from 2029, one year after the debt-brake threshold is reached. In this case, net receipts would increase for all generations from 1950 on, while the burden would increase for generations born after 1990. The total increase in the tax burden would be about 19%. Comparing the baseline scenario, in which no change occurs, with the alternative sustainable finance scenario, it is clear that future generations, especially those born after the 2040s, will bear the greatest burden (Chart 5.6.3).

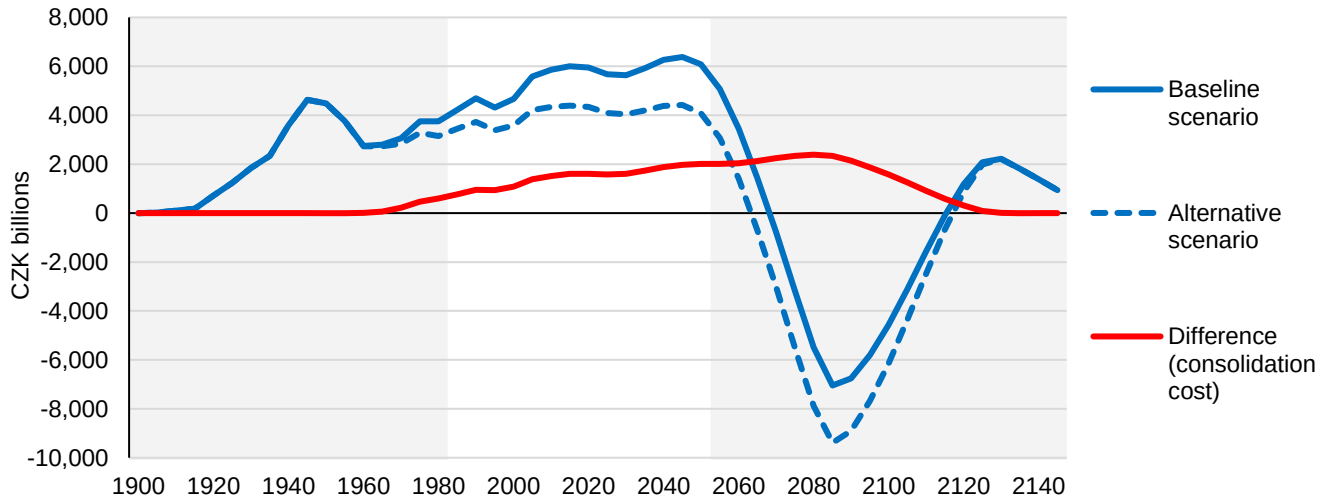
[92] Revenues and expenditures are expressed in real terms at 2021 prices and are discounted by a real interest rate of 1%.

Chart 5.6.2 Public budget payments and receipts of a given generation[93]



Source: CZSO (2023), CSSA (2023); CFC calculations.

Chart 5.6.3 Net receipts of each generation – baseline and alternative scenario[97]



Source: CZSO (2023), CSSA (2023); CFC calculations.

5.6.2 Generational accounts and the pension system

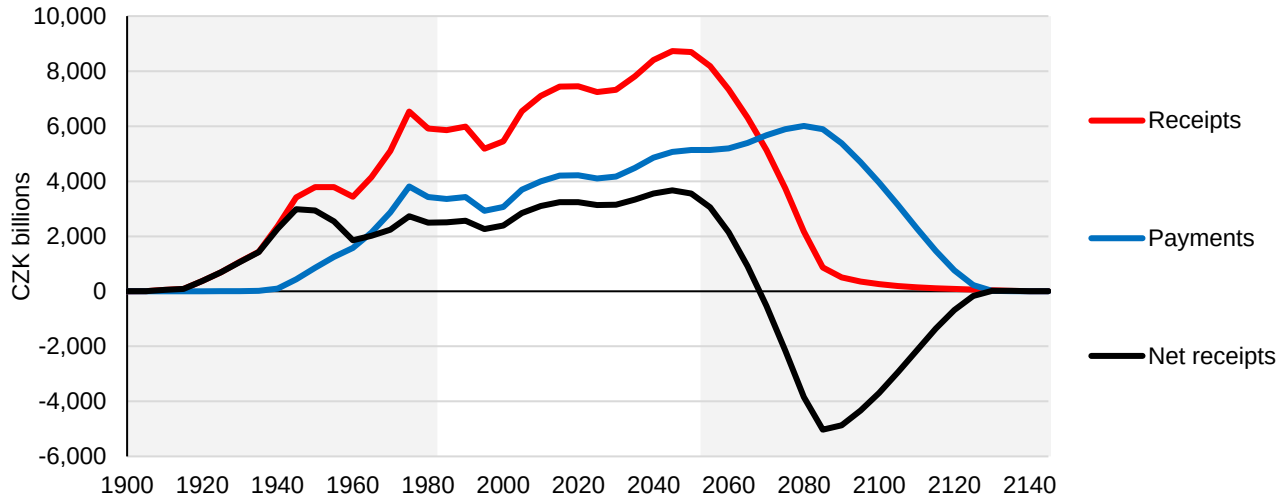
In the previous subsection, we constructed generational accounts for as broad a set of generation-specific household revenue and expenditure as possible. To discuss the implications of pension reform for different generations, it is useful to examine specifically pension revenue and expenditure within these generational accounts.

The pension system in the Czech Republic is largely based on solidarity between generations, where social security contributions paid by the economically active generation are directly used to pay existing pensions (the so-called pay-as-you-go pension system). Therefore, in the generational accounts model, we include the pension insurance payments of the working population (i.e. the pension system's revenue), which we then compare with the pension system's expenditure to pay the pensions of the economically inactive population. In projecting pension expenditure across generations, we have used the methodology for calculating this expenditure set out in subsection 3.1 of this Long-Term Sustainability Report.[94] We take into account

[93] The data in the graphs in subsections 5.6.1 and 5.6.2 covering the period 1900–2150 (and 1950–2100) are in 2022 prices, discounted by a 1% real interest rate. The *x-axis* shows each generation by their five-year birth periods. Generations for which either their entire working career is not included or their entire pension drawdown period is not covered are highlighted in grey.
[94] See also OCFC (2019): Projekce důchodového systému [Pension System Projections, available in Czech only] and OCFC (2022): Odhad náhradového poměru dávek důchodového pojištění [Estimating the Replacement Rate of Pension Benefits, available in Czech only].

expenditure on old-age, disability, widows', widowers' and orphans' pensions. In projecting of pension system revenue by generation, we have followed the methodology for calculating this revenue for the entire pension system (see subsection 3.6 of this Long-Term Sustainability Report). We have then allocated these contributions to the pension system by generation based on the amount of wages paid. We held the ratio of the wage of a generation of a certain age to the average wage in the whole economy, as well as the participation rates and the cyclically adjusted unemployment rates of each cohort, constant over time. In the baseline scenario, we assume the same setting of pension system parameters as we considered in our projections in subsection 3.1.[95] The amount of net receipts (pensions paid minus social security contributions) from the pension system for each generation is thus determined by the amount of pensions per pensioner, but it also reflects the relative size of the generation, its life expectancy and retirement age. Now the relatively older generations in the period 2000–2150 no longer contribute to the scheme and only draw pensions (left part of Chart 5.6.4). In contrast, the youngest generations, who are yet to be born and will not reach retirement age over our projection period, will only contribute to the system (except for disability and orphan pensions), see the right-hand side of Chart 5.6.4.

Chart 5.6.4 Pension system payments and receipts of individual generations[97]



Source: CZSO (2023), CSSA (2023); CFC calculations.

The generations for whom we cover their entire work and retirement cycle start with the generation born in 1980 and end with the generation of 2050. All of these generations will receive more from the pension system than they pay into it. Meanwhile, the estimated net take-up for these generations is higher than we estimated in the 2022 Long-Term Sustainability Report. Relatively younger generations will gain more, mainly due to a combination of their higher life expectancy and the retirement age being capped at 65. The higher net receipts of these generations is also due to their higher level of real income. However, the calculation in Chart 5.6.4 does not take into account that the current set-up of the pension system is unsustainable in the long run and will lead to an escalation of public sector debt, as discussed in Chapter 4. The delay in pension reform will affect younger generations significantly more than older generations.

Therefore, we have constructed a set of simple alternatives that we construct so that the accumulated balance of the pension system is balanced in 2073. There are several ways to achieve this outcome. One can either adjust the revenue side of the pension system (increasing the social security contribution rate) or the expenditure side (reducing the replacement rate and thus reducing pensions), or a combination of the two. One of the options is also a shift in the retirement age (see subsection 5.3), which is similar in its impact to a reduction in pensions. Below, we consider two options separately: first, a situation where only the social security contribution rate increases and pensions remain the same relative to average wages as in the baseline scenario (Chart 5.6.5), and secondly, a situation in which, on the contrary, the contribution rate remains at its current level and pensions decrease relative to wages, or the replacement rate decreases (Chart 5.6.6).

[95] Revenues and expenditure are expressed in real terms (2022 prices; indexed by the GDP deflator) and discounted by a real interest rate of 1%.

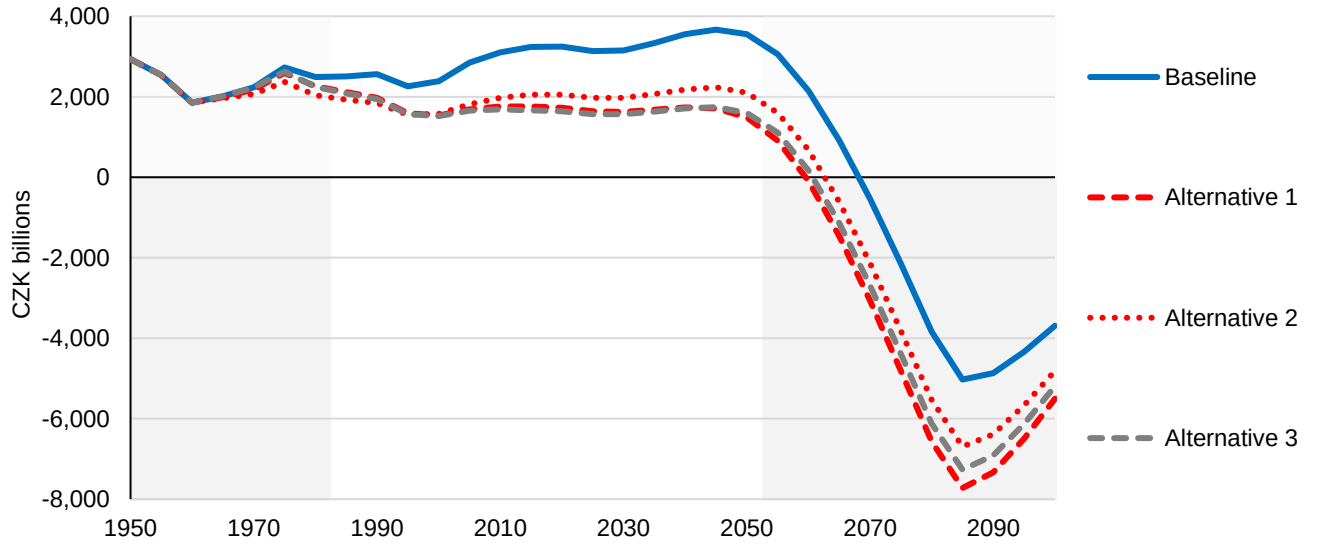
In both options we consider different alternatives for change. In Alternative 1, we assume a pension system that is balanced annually. Thus, for each year, we calculate a contribution rate (or replacement rate) that equalises the revenue and expenditure of the pension system. In this alternative, the central authorities wait to reform the system until the pension system starts to deteriorate significantly due to population ageing (i.e. until around 2040). This alternative results in pension insurance rates rising to 30% (i.e., by roughly 2 pp). By 2030, they then fall to 29% of revenue, only slightly higher than the current rate of 28%. However, they then rise to above 40% in 2059 due to the increasing number of pensioners. This means that the economically active generation would face a 12 pp higher pension insurance burden in 2059 than the working generation now, who will already be drawing pensions at that time.

On the other hand, keeping the current pension insurance rate would mean that pensions would have to fall from the current level of around 45.8% of average wages to 29.6% around 2059. In this case, the burden of debt sustainability would be borne by the current economically active generation who would see relatively lower pensions than current pensioners.

In other alternatives, we increase the pension insurance rate or reduce the replacement rate so that, cumulatively, the pension system is in balance by 2073.[96] Alternatives 2 and 3 differ from each other in terms of when the pension insurance rate and replacement rate increase and decrease respectively. In Alternative 2, we consider an interest rate increase from 2029, the year after the debt brake threshold is reached. In Alternative 3, the interest rate rise then takes place in 2039, when we project that the interest rate will exceed nominal GDP growth and the debt will become unsustainable. Of course, as the rate increase is delayed, the required response will have to be more pronounced. While the insurance rate increases from the current 28% of income to 35.9% in Alternative 2, it reaches 38.6% in Alternative 3. However, it is questionable whether such a dramatic increase in the insurance rate would not raise labour costs above a sustainable level with implications for the international competitiveness of the Czech economy and overall macroeconomic performance.

Chart 5.6.5 shows that an increase in pension insurance rates would mainly burden younger generations. These impacts are greatest in alternatives 1 and 3, where the recently born and future generations are much more affected than those born before the turn of the millennium. Earlier rate increases are slightly more equitable across generations than the other alternatives because they spread the cost of stabilizing the pension system across more generations.

Chart 5.6.5 Rising insurance rate scenario (net balance)[97]



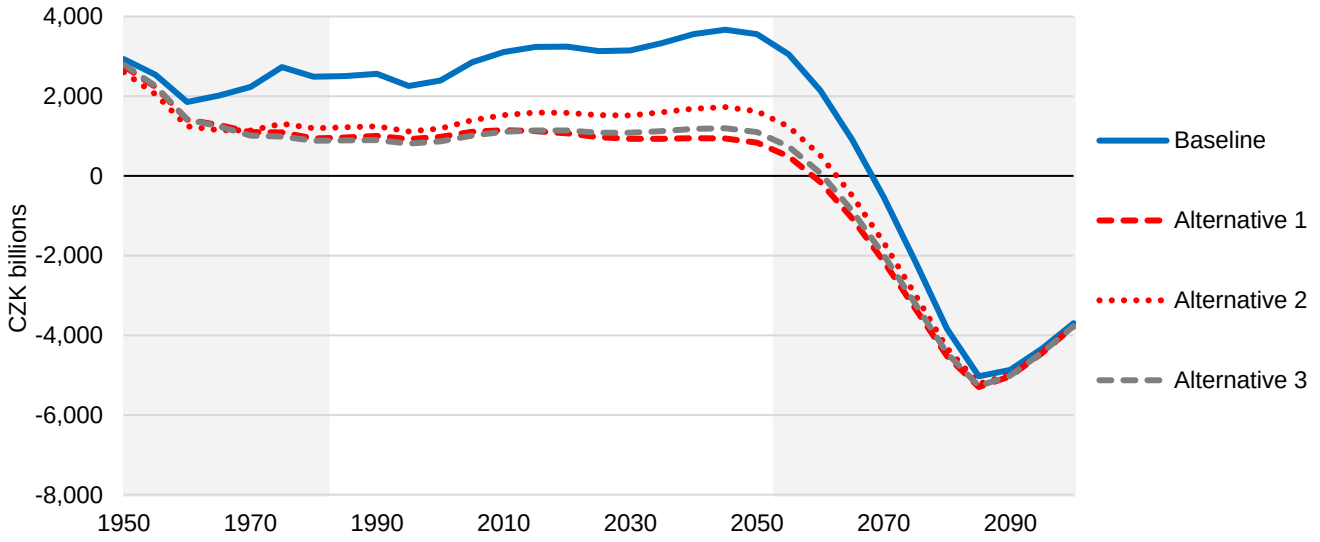
Source: CZSO (2023), CSSA (2023); CFC calculations.
Note: In each alternative, the pension insurance rate is increased so that the pension system is in balance in 2073. In alternative 1, this is achieved with the help of an annually balanced pension system, in alternatives 2 and 3 we consider increasing the rate from 2029 (i.e. one year after the debt brake threshold is reached) and 2039 respectively.

[96] These alternatives are therefore set so that the net present value of pension system revenue over the period 2023–2073 is equal to the net present value of pension expenditure over the same period. Unlike Alternative 1, in which the pension system is stable over the entire 2023–2150 horizon, in Alternatives 2 and 3, the pension system is not necessarily stable after 2073.

If we assume that the pension insurance rate will remain at the current level of 28% in the future and that the retirement age will not change, then a reduction in replacement rates will be necessary to achieve a balanced pension system. Chart 5.6.6 shows that both the older generation (starting with the generation born in the 1960s) and the younger generation will be worse off when pensions are reduced, so that the distribution of the impact of pension system consolidation will be more distributed more evenly across generations compared to the increase in the pension insurance rate at the same point in time. Again, if pension cuts occur earlier, the burden will be shared more evenly across generations. If, on the other hand, pension cuts start later, the impact on the older generations will be lower at the expense of the younger generations. Let us add that the current version of the pension reform (see subchapters 5.2 and 5.3) is most similar to alternative 2 with a reduction in replacement rates, since the start of both the lower indexation and the increase in the retirement age above 65 occurs around 2030. Compared to Alternative 2 presented in Chart 5.6.6, the impact of the reform will be somewhat lower overall for most generations (even after the reform, the pension system will continue to generate deficits), with more pronounced impacts for generations born after 1965.

Our projection of changes to the pension system settings is simplistic in many respects, but it is clear that postponing parametric changes in the pension system will asymmetrically burden younger generations born after the turn of the millennium. At the same time, it is evident that adjustments to the pension system settings focused on the expenditure side bring about a more even distribution of impacts across generations compared to adjustments on the revenue side, and can be perceived as more 'fair'.

Chart 5.6.6 Falling replacement rate scenario (net balance)[97]



Source: CZSO (2023), CSSA (2023); CFC calculations.
Note: In each alternative, the replacement rate is reduced so that the pension system is balanced in 2073. In alternative 1, this is achieved with the help of an annually balanced pension system, while in alternatives 2 and 3 we consider a decrease in the replacement rate from 2029 (i.e. one year after the debt brake is reached) and 2039 respectively.

5.7 Comparison with the previous Long-Term Sustainability Report

Compared to the Long-Term Sustainability Report published in 2022, this current edition is slightly more pessimistic in terms of the assessment of the sustainability of public finances. Debt at the end of the projection has increased from 296% of GDP to 311% of GDP.

The debt projection was affected by a shift in the initial conditions related mainly to the inflation shock in 2022. Nominal GDP grew by 11.1% in 2022 and was about 2.5% higher than projected by the MF CR in 2022.[97] At the same time, higher-than-forecasted nominal GDP led to downward pressure on the ratio of government revenue and expenditure to GDP for a given projection of government revenue and expenditure. At the same time, for a number of government expenditures (with the exception of index-linked pension expenditure and payments for state insurers), high price growth led to a decline in the real value of these expenditures. However, high price increases and the associated monetary

[97] Forecast by the MF CR (April 2022): Macroeconomic Forecast of the Czech Republic.

tightening were reflected in an increase in debt servicing costs, which in turn pushed up debt. Meanwhile, projected interest costs have risen by up to three-quarters relative to GDP for the coming years.

Compared to the Long-Term Sustainability Report issued in 2022, lower total public sector spending on education and other social benefits in cash was mainly responsible for the slower increase in debt. In contrast, pension expenditure, which is subject to indexation, is higher relative to GDP for the coming years. In the longer term, this expenditure, like health expenditure, is mainly affected by demographic developments. The projection of these expenditures mainly reflects changes in demographic projections related to the change in the initial age structure of the population. Here, there has been a relatively significant increase in the population due to the refugee migration wave. The higher initial population will subsequently be reflected, for example, in a higher projected number of pensioners. An item that is also newly subject to indexation and which affects symmetrically the revenue and expenditure of public budgets is payments for state-insured persons from the state budget to health insurance companies. The projection of these payments is relatively much higher than in last year´s Long-Term Sustainability Report, but is budget-neutral for the overall public finances.

Loose spending policies continue to act in the direction of the increase in debt. There has been an increase in the projected replacement rate of old-age pensions, mainly due to the increase in the default replacement rate for 2023. In 2022 and 2023, the increase in the replacement rate was driven by high inflation and the associated three extraordinary pension indexations (in June and September 2022 and June 2023), so that pensions grew faster than wages. The 2023 replacement rate was also affected by the introduction of the child-rearing bonus. These increases in pensions and replacement rate will affect pension spending for many years to come.

The projection of primary deficits points to debt hitting the debt limit in 2028, the same year as projected in the previous edition of the Long-Term Sustainability Report. Given the increase in projected primary structural deficits, interest costs and debt, the so-called sustainability gap for public finances has increased from 6.04% last year to 6.22% of GDP this year. The sustainability gap shows how much better the primary structural balance would have to be each year from 2023 to 2073 for the debt to be below the debt limit in 2073.

Conclusion

The current Long-Term Sustainability Report shows a very similar overall situation in terms of the long-term and medium-term sustainability of Czech public finances compared to last year's report. The projected public debt at the end of the projection is slightly higher, but the projected breaching of the debt brake threshold occurs in the same year (2028). There is a slight improvement in the projection of primary deficits for the coming years, mainly due to the update of economic data and better-than-expected performance in 2022. On the other hand, projected debt servicing costs are rising due to the increase in interest rates. The outlook for expenditure is more favourable for items that have not been subject to automatic indexation, while expenditure that is indexed (pensions and payments to health insurers for the state insurees) is on the downside. Thus, in the baseline scenario, there is no reduction in the long-term imbalances, which continue to reflect the rising costs of the pension and health systems in the context of an ageing population.

In the course of 2023, efforts to consolidate public finances are under way, having the potential to at least partially reduce future long-term public finance imbalances (the so-called government consolidation package and changes to the pension system). This Long-Term Sustainability Report presents the main public finance reforms under alternative scenarios. We examine a combination of measures on the revenue side of public finances, which affect structural deficits in the short term, with changes in the pension system, where adjustments to the indexation of pensions to real wages and increases in the retirement age start to translate into lower spending only after 2030. Indeed, a number of these measures are shown to bring about a significant reduction in medium- and long-term imbalances, with debt falling by up to 123% of GDP over the projection period, which is indeed a significant change. The CFC therefore appreciates that, for the first time in a long while, tax and expenditure policy adjustments are being presented and adopted that have a positive impact on the long-term sustainability of public finances, rahter than the other way around.

Appendices

D.1 Summary table of general government revenue and expenditure in selected years (% of GDP) - medium variant of demographic projection

	2023	2033	2043	2053	2063	2073
REVENUE						
Personal income taxes	3.5	3.6	3.7	3.7	3.8	3.8
Corporate income taxes	3.7	3.4	3.2	3.0	2.9	2.8
Other current taxes	0.2	0.2	0.2	0.2	0.2	0.2
Social security contributions	15.8	16.1	16.3	16.5	16.5	16.5
pension insurance	*8.3*	*8.5*	*8.7*	*8.8*	*8.9*	*9.0*
public health insurance (excluding state insurees)	*4.4*	*4.5*	*4.6*	*4.7*	*4.7*	*4.8*
payments for state insurees	*1.9*	*1.8*	*1.8*	*1.8*	*1.6*	*1.5*
other	*1.2*	*1.2*	*1.3*	*1.3*	*1.3*	*1.3*
Taxes on production and imports	11.2	11.2	11.2	11.2	11.2	11.2
Property income	0.6	0.6	0.6	0.6	0.6	0.6
Other revenue	4.8	4.8	4.8	4.8	4.8	4.8
TOTAL REVENUE	39.8	39.9	40.0	40.1	40.0	39.9
EXPENDITURE						
Pensions	9.3	9.0	11.2	12.9	13.0	12.1
Health care (public health insurance system only)	5.6	6.0	6.3	6.5	6.6	6.5
Other social benefits in cash	3.0	3.2	3.5	3.8	4.0	4.0
Payments for state insurees	1.9	1.8	1.8	1.8	1.6	1.5
Long-term care outside the public health insurance system	0.6	0.7	0.8	0.9	1.0	1.0
Education	4.9	4.9	5.0	5.3	5.3	5.2
Other expenditure – baseline scenario	17.1	17.1	17.1	17.1	17.1	17.1
Changes related to convergence	0.0	0.6	0.6	0.6	0.6	0.7
public investment	*0.0*	*-0.1*	*-0.2*	*-0.3*	*-0.3*	*-0.3*
defence expenditure	*0.0*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
growth in general government costs (wages)	*0.0*	*0.1*	*0.2*	*0.3*	*0.3*	*0.4*
growth in payments to EU	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Total expenditure excluding interest	42.5	43.2	46.4	48.9	49.3	48.2
Primary balance	-2.7	-3.4	-6.4	-8.8	-9.3	-8.3
Interest (no interest rate feedback)	1.2	1.8	2.8	4.7	6.6	8.1
TOTAL EXPENDITURE (no interest rate feedback)	43.8	45.0	49.2	53.6	55.9	56.3
TOTAL BALANCE (no interest rate feedback)	-3.9	-5.1	-9.2	-13.5	-15.9	-16.4
DEBT (no interest rate feedback)	44.0	67.9	111.0	180.9	254.1	310.6

Source: CFC calculations.
Note: totals in the table may be subject to inaccuracies due to rounding.