CC BY 4.0

International Experience of Long-Term Budget Projections: National and Subnational Levels

N.E. Barbashova[a] ✉, A.N. Komarnitskaya[b]
[a, b] Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia;
[a] Financial Research Institute, Ministry of Finance of Russia, Moscow, Russia
[a] https://orcid.org/0000-0003-1614-7368; [b] https://orcid.org/0000-0002-7775-2548
✉ Corresponding author

ABSTRACT

The **subject** of the research is the approaches used in foreign experience in the formation of forecasts of budget parameters for the long term. The study **aims** to determine the quality criteria for national and regional long-term budget projections based on the best practice of developed countries. In foreign practice, the question of choosing preferable solutions for long-term budget projections remains open. In Russian studies, some of the above issues are highlighted as of the first decade of the 2000s and require updating, and the foreign regional experience on the use of the long-term budget forecasting lacks detailed analyses. This substantiates the **relevance** of this study. The **novelty** consists in highlighting the list of "best practices" in implementing long-term fiscal projection for the national and subnational levels based on the study of the experience of foreign countries. To achieve this goal, the author uses **methods** of a comparative analysis of international experience in building budget forecasts, system analysis, and analogy. As a **result**, a list of criteria that meet the good practices of developing long-term budget forecasts has been formed. It is proposed to determine the forecasting horizon within 30–50 years, generate forecasts annually or with a specified frequency if there is a mechanism for updating them. The authors conclude that developing forecasts on a scenario basis using the principle of continuity in relation to the estimates obtained and forecasting methodology, as well as assessing the sensitivity of budget parameters to exogenous factors and budget sustainability are necessary characteristics of long-term budget projections. **Prospects** for the study consist in studying methodological solutions for forecasting budget parameters and developing tools for the regions of the Russian Federation for calculating indicators of long-term budget projections.
Keywords: long-term budget projections; fiscal sustainability; international experience; subnational budgets

INTRODUCTION

The world's leading economies recognize the importance of assessing the prospects for the development of public finances in the long-term perspective. Long-term budget projections make it possible to trace the prospects of the current fiscal policy from the point of view of the sustainability of the budget system in the future in the context of certain demographic trends [1]. In this regard, in world practice, the majority of documents containing long-term budget projections include the analysis of fiscal sustainability. The long-term budget projection is based on the assumptions that the main trends in terms of demographic characteristics, micro- and macroeconomic indicators will continue. If the long-term forecast shows the sufficiency of budget revenues to address priority tasks and the absence of a "pyramidal" increase in the deficit and public debt, then the current fiscal policy is recognized as sustainable. Otherwise, it can be concluded that the existing approaches need significant adjustments [2].

Long-term budget projections are a relatively new tool that has been actively used around the world since the 1990s. In Russia, the first long-term budget projection was approved by the Government of the Russian Federation in 2019. International organizations have not yet formulated comprehensive and detailed recommendations on documents containing forecasts of the state of public finances for a long period. Determination of more general solutions or individual successful "point" mechanisms is carried out through a comparative analysis of the experience of different countries and the selection of best practices based on expert opinion.

Long-term forecasting is primarily associated with the function of the central government. At the same time, demographic issues are relevant to all levels of government, making this fiscal policy instrument suitable for use at the subnational level. The formation of such documents by region allows determining the risks that may arise as a result of changes in socio-economic conditions while maintaining the current policy, as well as, if necessary, adjusting budget decisions.

In foreign practice, the topic of forecasting long-term budget parameters has been thoroughly elaborated for the national level, which cannot be said about the regional aspect of long-term budget projections.

The experience of the subnational level is hardly mentioned in scientific works, without considering the content of the relevant documents, approaches to their development, and the relationship with national long-term projections. This gap is partly due to the lower prevalence of long-term fiscal projections at the regional level due to the lack of regulation by the central government. Nevertheless, individual cases allow tracing the possible directions of using the tool under consideration at the regional level.

The works of domestic scientists describe international experience [3–5] and consider some methodological aspects of constructing such projections [6]. The base of the research, as a rule, is the article by B. Anderson and J. Sheppard [7].

The problem of the sustainability of public finances associated with long-term budget projections is considered in dissertations with proposals for possible assessment methods for Russia [8, 9].

The problem of forming long-term budget projections at the subnational level of government has been studied to a lesser extent. Articles by G. Ya. Shakhova with co-authors [10] and A. Deryugin with co-authors [11], dissertation by M. V. Semibratskii [12] are devoted to the construction of such a document by the Russian regions, however, the corresponding foreign practice is hardly presented. At the same time, some countries have accumulated experience in long-term forecasting of the state of regional finances, the analysis of which can be useful for finding solutions to problems urgent for Russian practice.

This article is an attempt to fill the gaps in the study of the problems of forecasting the state of public finances in the long term and to lay the foundation for the development of recommendations for improving Russian practice. The study aims to determine the

quality criteria for national and regional documents of long-term budget projections based on the best practices of developed economies. Through comparative analysis, the use of grouping methods, and analogy, the generally accepted and "best" solutions are identified both in the ideology of developing such documents and their integration into the budget process and in methodological decisions.

The results obtained can become a starting point for further research in the context of the issues raised in relation to Russia, where long-term budget projections are developed at the federal and regional levels every 6 years for a period of at least 12 years based on the forecast of socio-economic development. Despite the influence of legislative norms on the need to develop a forecast from 2015, the first long-term budget projection was approved by the Government of the Russian Federation after 4 years[1] and was not updated after that, although such a mechanism is provided.[2] At present, almost all regions of the Russian Federation have adopted long-term forecasts of budget parameters. These documents focus on forecasting budgetary expenditures and revenues, leaving aside the question of readiness to meet future demographic and macroeconomic challenges while maintaining current policies.[3] As a result, the budget projection looks like an attempt to calculate the exact values of budget indicators for almost two decades without assessing budget sustainability, which is inconsistent with world practice.

Long-term budget projections in domestic practice are still on the path of integration into the budgetary and political process. Thus,

the calculated values of budget expenditures and financial support of state programs for forecasting the federal budget for the long term were not used in the subsequent budget cycle. In its current form, the long-term budget projection tool is divorced from reality: federal and regional projections, together with long-term socio-economic projections, are not updated considering the changed external and internal conditions, including the coronavirus pandemic and anti-crisis state policy. A common feature of sub-federal projections — limited disclosure of the methodology for calculating the parameters of the budget system in the long term — reduces the transparency of forecasting. The lack of a quantitative assessment of the impact of individual exogenous factors (the so-called sensitivity analysis in world practice) on the forecast values of budget parameters narrows the idea of the risks of sustainability of the budget system.

NATIONAL LONG-TERM FISCAL PARAMETERS PROJECTIONS

Long-term budgetary projections and related analytical tools have a relatively short history. Since the mid-1990s the practice of using this tool has expanded significantly and at present most OECD countries have such projections [13]. The forecast horizon ranges from 25 years in South Korea to 75 years in the United States[4] и Канаде, and Canada, and for most countries it is 40–50 years. When forecasting, countries tend to stick to rolling estimates. Forecasting up to a fixed year[5] is carried out by the European Commission for the European Union[6] and its member states both in a separate series of documents on population aging (Ageing reports) and in the annually published debt sustainability reports and overviews of the EU member states stability program.

---

[1] Government Decree of the Russian Federation of March 29, 2019 No. 558-r "On approval of the budget projection of the Russian Federation for the period up to 2036". SPS ConsultantPlus.

[2] Paragraph 3, clause 3, art. 170.1 of the Budget Code of the Russian Federation. SPS ConsultantPlus.

[3] Ministry of Finance of Russia. Analysis of the current practice of forming budget projections of the constituent entities of the Russian Federation. 2020. URL: https://minfin.gov.ru/ru/perfomance/budget/policy/?id_57=132277analiz_deistvuyushchei_praktiki_formirovaniya_byudzhetnykh_prognozov_subektov_rossiiskoi_federatsii (accessed on 28.04.2021).

[4] The Financial Report of the United States Government, prepared by the United States Department of the Treasury.

[5] From 2021, long-term projection is carried out until 2070.

[6] Specifications on the implementation of the Stability and Growth Pact and Guidelines on the format and content of Stability and Convergence Programmes. European Commission. URL: https://ec.europa.eu/info/sites/default/files/code_of_conduct_en1.pdf (accessed on 03.05.2021).

Long-term budgetary projection documents are prepared annually in the EU (by the union and member states in accordance with the EU regulation), UK, USA, Canada. In some developed countries, such documents are published at intervals of 3–5 years (Australia, New Zealand, Norway, EU in the case of an ageing report) or on a specific schedule (South Korea, Japan). There is no formal mechanism for unscheduled adjustments to the current projection, but the decision to update the projection outside the accepted schedule can be made "in manual mode" depending on the current situation. Thus, in Canada in 2020, for the first time, an update of the national fiscal sustainability report[7] was published according to a previously established schedule, which considered the consequences of the pandemic and the government's anti-crisis measures.

Regulation of long-term budgetary projections is reduced to the consolidation of general issues: the purpose, the person in charge, the frequency of publication of the document. The methodology and details of the formation of a long-term budgetary projection are not regulated by laws or departmental acts. Disclosure of information on the approach to forecasting certain parameters is distributed directly in the document of long-term budgetary projections. Methodological aspects are also highlighted in the analytical materials of the responsible authority.

In exceptional cases, different departments prepare several long-term projections. The Congressional Budget Office annually publishes the Long-term Budget Outlook[8] for the next 30 years — the dynamics of demographic, economic, and budget parameters, describing several alternative scenarios. The 25-year projections are incorporated by the Office and the Budget into the annual budget message of the President of the United States. The longest-term projections — for the next 75 years — are prepared annually by the country's Ministry of Finance and assess fiscal sustainability.

Long-term projections of fiscal parameters are most often the function of the fiscal policymakers [Australia, USA (State Budget Statement), New Zealand, UK, Norway, etc.]. In the United States (Long-term Budget outlook) and Canada, the Legislative Budget Office is responsible for developing such projections. Documents containing long-term projections of the state of fiscal parameters are not subject to approval by the legislature, but, as a rule, are submitted to it for consideration.

The documents developed in foreign countries devoted to the analysis of fiscal sustainability are similar in content. These are complex reports for a selected period of time with an analysis of the obtained results of forecasting demographic and economic parameters and projections of the state of public finances based on them. Based on the calculated projection values of budget parameters for the long term, an assessment of budget sustainability is carried out. An important result of forecasting and the accompanying study of the obtained values is a list of risks that are present for the sustainability of government finances. In other words, the purpose of such documents is to identify possible financial challenges that the government may face in the long term, given current policies, an aging population, and dynamics of macroeconomic indicators.

It is important to note that long-term projections in foreign countries do not take the form of setting annual targets or thresholds for budgetary expenditures or revenues for the next decades. The projection results can be presented as aggregated directions of expenses for several points of the selected long-term period. The greatest detail of the projections is presented in the form of a functional classification of expenditures, the smaller is the division into expenditures, the dynamics of which is due to demographic changes, and all other expenditures. Considerable attention is paid to the block of demographic and economic parameters, as well as the analysis of budget

---

[7] Fiscal sustainability report 2020: update. Office of the Parliamentary Budget Officer. Nov. 2020. URL: https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/RP-2021–033-S/RP-2021–033-S_en.pdf (accessed on 02.05.2020).

[8] The 2021 Long-term budget outlook. Congressional Budget Office. URL: https://www.cbo.gov/system/files/2021–03/56977-LTBO-2021.pdf (accessed on 30.04.2021).

parameters that depend on the aging of the population.

In most countries, long-term projections are done for the general government budget. Australia, New Zealand, the USA, and the UK build such projections for the central government budget. There is also a separate projection for the state of the pension system (for example, in Canada, Norway, UK, Australia). The Government of Canada pays special attention to subnational finance and in the national report presents a projection for all regions of the country, as well as formulates conclusions and recommendations regarding the fiscal sustainability of the Territories.[9]

The approaches to the projection of the long-term fiscal parameters can be divided into two groups: the top-down approach and the bottom-up approach. With the first approach the long-term projections are carried out based on the current goals of budgetary policy (most often, the level of expenditures to GDP, taxes to GDP and government debt to GDP), based on the need to achieve which, the necessary indicators of expenditures or revenues are determined considering possible changes in demographic indicators. According to the second approach, budget parameters are modeled on the basis of the predicted values of demographic and economic parameters, as well as the assumption of the invariability of government policy. There are no restrictions on income, expenses, or budget deficits. As a result, the obtained values of budgetary indicators and indicators of budgetary sustainability are analyzed with modeling of changes in exogenous factors. Long-term projections can be based either on one approach (for example, in Australia, EU, USA, New Zealand, projections are based on a bottom-up approach) or on a combination of the above (UK, Norway).

Long-term budget projection documents are associated with estimates of budget parameters for the medium term. The selected

long-term time horizon is divided into two segments: the coming years and the remaining period for which separate projections are made. The values of the budget parameters in the first segment are duplicated from the actual medium-term budget projections, which, as a rule, are prepared together with the draft budget for the next year. For the second segment, direct forecasting of the values of budget indicators is carried out using the selected prerequisites and the results of calculations of demographic and economic factors. For example, in Canada, the first-time span is 4 years, and the remainder is from 5 to 75 years. In Australia and the United States (Long-term Budget Outlook), medium-term projections are made for a 10-year period and long-term projections are for the remaining years of the 40-year and 30-year periods, respectively.

Budget parameters projection is carried out using economic and mathematical modeling. In global projection practice, as a rule, dynamic general equilibrium models or modeling of the values of fiscal parameters based on their growth rates in the long term are used. The second approach is less formalized, the main task is to select and justify the rate of growth of budget characteristics in the long term. As a rule, the choice is based on an expert opinion on the advisability of using a particular modeling method.

Of all the variety of solutions found in the world practice of long-term projections, the following are the most common.

Budget expenditures are projected separately from expenditures, the volume of which depends on the age structure of the population and all other expenditures that are not affected by the aging of the population. The first includes spending on education, health care, social security (pensions, health insurance, social benefits). The projections of the listed costs depend on the obtained values of demographic indicators in the long term. For all other areas, growth is usually assumed to be proportional to GDP growth.

For budget revenues, the assumption is made that they are constant in relation to GDP

---

[9] Fiscal sustainability report 2020: Update. Office of the Parliamentary Budget Officer. Nov. 2020. URL: https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/RP-2021–033-S/RP-2021–033-S_en.pdf (accessed on 02.05.2020).

in the long run, which is determined on the basis of historical values.

The most commonly used forecasting is based on the calculation of the base budget. The projection of fiscal parameters (budget revenues, expenditures, deficit/surplus, public debt) is constructed for a given planning period using a set of assumptions regarding demographic, economic parameters, and the invariability of the current fiscal policy. The last condition implies, in particular, the preservation of the existing tax rates, social transfers (relative to the level of wages), the provision of public services (defense, law enforcement agencies, public administration, etc.). The base budget calculated in this way is used to simulate various scenarios of changes in economic and demographic parameters.

The scripting approach used in many countries can take many forms. A long-term forecast document can be constructed directly for several scenarios — a set of variants of the dynamics of individual exogenous demographic and macro indicators. For each scenario, the predicted values of the resulting parameters and the probability of its implementation are determined. Scenarios can also be used for selected indicators, for example, budget expenditures, budget balances, and public debt depending on the age structure of the population. In this case, the document is formed on the basis of the initial conditions (or the most likely scenario), and when predicting individual indicators of the state of government finances, several options for their values are given, depending on the scenario for some external factor. Another variant of the scenario approach is the assumptions regarding the implementation of a certain set of political decisions. In this case, a long-term projection document is formed according to the indicated scenarios for the implementation of reforms. This practice is rare, for example in Australia when developing a long-term projection for 2015.[10]

An analysis of the sensitivity of the constructed projections of budget parameters to certain exogenous factors can be considered a component of the scenario approach. It consists of a quantitative assessment of the impact of changes in the values of certain demographic and macroeconomic indicators on the projection of fiscal parameters. The values obtained from the analysis, by analogy with the elasticity, show fluctuations, for example, in the indicators of the primary deficit, the fiscal gap when certain exogenous factors change, as a rule, by 1%. All other external variables are considered unchanged. Thus, sensitivity analysis allows calculating the consequences of a change in one particular factor on the resulting budget parameters. This makes it possible to form a vision of the consequences of shocks of certain factors for government finances, as well as to determine the exogenous variables most affecting fiscal sustainability. At the same time, the results of the sensitivity analysis are not related to each other for different external factors, and additional calculations are required to calculate the effect of simultaneous changes in several of them.

Assessing fiscal sustainability is practically an integral part of long-term projections.[11] The method of assessment depends on what is meant by the sustainability of government finances in each particular country. A common definition: fiscal sustainability is the government's ability to finance priority programs, as well as service its debt obligations without critical adjustments to the balance of revenues and expenditures [14]. Also, sustainable development should exclude the situation of increasing debt at a higher rate than the growth of the ability to service it.

The theoretical foundations of methods for assessing fiscal sustainability are laid in the works of J. Horne [15] and O. Blanchard [16]. Evaluation is often carried out through the calculation of the fiscal gap indicator, in which, by means of an intertemporal budget constraint, the indicators of budget revenues

---

[10] Intergenerational Report 2015. Treasurer of the Commonwealth of Australia. URL: https://treasury.gov.au/sites/default/files/2019–03/2015_IGR.pdf (accessed on 01.05.2021).

[11] For example, Australia's long-term report does not provide a calculation of fiscal sustainability indicators, and the analysis of the results of long-term projections indirectly affects the problem of fiscal sustainability.

and expenditures are linked for a selected time interval.

The calculation of the fiscal gap (Δ) is carried out according to the following formula[12]:

$$\Delta = \frac{D_t - \prod_{i=1}^{k}\left(\frac{1}{1+i_{t+i}}\right) \times d^* \times \overline{Y_{t+k}} - \\ -\sum_{i=1}^{k}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right) \times \overline{PB_{t+i}}}{\sum_{i=1}^{k}\prod_{j=1}^{i}\left(\frac{1}{1+i_{t+j}}\right) \times \overline{Y_{t+i}}},$$

where D — the size of the public debt; i — the interest rate of debt service; d^* — the ratio of government debt to GDP at the end of the period; PB — the value of the primary budget balance; Y — projected values of GDP; k — the projection period.

The desired level of debt burden (d^*) is usually taken as the ratio of the current level of government debt to GDP. For example, in the UK this level is 75% of GDP,[13] in Canada — 28,5% of GDP.[14]

The result of calculating the budget deficit is a specific target value by which it is required to change the indicator of the budget deficit by making budget decisions in terms of increasing revenues and/or reducing expenditures in the short term.

The EU uses the S 2 indicator, specially designed to assess long-term fiscal sustainability, the value of which corresponds to the required annual adjustment of budget parameters over a selected period of time to stabilize the public debt-to-GDP ratio, considering the "price" of population aging. The higher the value of S 2 (it is assumed that the cutoff value is 6% of GDP), the higher

the threat to the sustainability of the budget system and, consequently, the need to adjust expenditures or revenues.[15]

In the context of a large number of uncertainties and prerequisites taken in the development of long-term budget projections, the issue of flexibility of the planning documents for the long-term period deserves special attention. Demographic and economic shocks of long-term projections have become relevant in connection with the 2020 crisis caused by the pandemic of a new coronavirus disease and a decrease in energy prices. The negative socio-economic consequences, together with large-scale anti-crisis packages at the national and subnational levels, increased the burden on budgets and led to an increase in debt obligations at all levels of the budget system. At the same time, most countries where long-term budget projections are not published annually did not update their current estimates, despite the crisis (with the exception of Canada). Australia has postponed the publication of the next projection for a year, despite the statutory schedule for the submission of the document.

Long-term budget projection documents are developed according to the principle of continuity. In case of significant changes in the forecast values, the next document provides an appropriate justification. The most common reasons for adjusting previously published forecast values include a modification of the assessment methodology, a change in the calculation base (the use of more relevant statistical data), and crisis phenomena. An important characteristic, in this case, is the coherence of the developed forecasts and the transparency of the reasons for their change.

A tool that can have a potentially positive impact on the quality of published forecasts is to consolidate the responsibility of the agency that makes the forecast. In New Zealand, this decision is legislative in nature: the head of the Treasury is obliged to sign a section with the

[12] Fiscal sustainability report 2020. Office of the Parliamentary Budget Officer. 2020. URL: https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/RP-1920–029-S/RP-1920–029-S_en.pdf (accessed on 05.05.2021).

[13] Fiscal sustainability report 2020. Office for Budget Responsibility. United Kingdom. 2020. URL: https://obr.uk/fsr/fiscal-sustainability-report-july-2020/ (accessed on 06.05.2021).

[14] Fiscal sustainability report 2020. Office of the Parliamentary Budget Officer. 2020. URL: https://www.pbo-dpb.gc.ca/web/default/files/Documents/Reports/RP-1920–029-S/RP-1920–029-S_en.pdf (accessed on 05.05.2021).

[15] Fiscal Sustainability Report 2018 // Institutional paper 094. European Commission. 2019;094:1–212. URL: https://ec.europa.eu/info/sites/default/files/economy-finance/ip094_en_vol_1.pdf (accessed on 11.05.2021).

responsibility of the department for the fact that the work in the preparation of the report on the long-term state of government finances is performed at a high professional level.

In the UK Fiscal Resilience Report, the management of the Office of Responsible Fiscal Policy indicates that it takes full responsibility for the forecasts, analyzes, findings, and recommendations presented. However, there is no mention of how this responsibility can be exercised in the listed countries.

The role of long-term budget projections in global practice, as a rule, is reduced to analytical. This is partly facilitated by the development of forecasts outside the executive branch of government, the rare publication of documents of long-term budget projections, the preparation of independent studies and reports that are not included in the budget process. On rare occasions, the government appeals to long-term estimates when making decisions.

In Australia, long-term budget estimates were used to illustrate the impact of decisions made to reform health, education, welfare, and social support in 2014–2015. The results of forecasting several scenarios for the implementation of reforms acted as an additional argument in favor of the option chosen by the government.

FORECASTING SUBNATIONAL FINANCES FOR A LONG-TERM PERIOD

The use of a long-term budget projection tool at the subnational level is less common than at the national level. The preparation of long-term budget projections occurs in a few regions of Australia and Canada. As a kind of subnational experience, one can consider the practice of EU member states in preparing long-term budget projections and analyzing the state of fiscal sustainability. The experience of long-term forecasting at the subnational level in the listed countries is individual and is conditioned, among other things, by national practice. In this regard, the case-based approach to the study of foreign experience seems to be justified.

Note that, with the exception of the EU member states, central governments do not establish regulatory requirements for the formation of documents for long-term budget projections by lower levels of government. The regions independently regulate the need to develop such documents. In general, the main vector of using the long-term budget projection tool is set by the central government.

Australia

New South Wales is the only region in Australia that publishes long-term budget projections. The purpose, content, publication schedule (every 5 years) and the period for which projections are made (40 years), as well as forecasting methodology, largely duplicate the decisions of the federal government for the Intergenerational report. Within the framework of the document, the Ministry of Finance of the region is considering the following issues: demographic changes, the future state of the region's economy, the state of government finances (with a separate analysis of infrastructure costs), upcoming challenges to the balance and sustainability of the state budget.[16] In contrast to federal practice, the state's report calculates the value of the fiscal gap, on the basis of which a conclusion is made about the sustainability of regional finances. It is important to note the connection between regional long-term projections and the federal projection. For example, the calculation of the forecast of future regional budget revenues from federal taxes is based on the projection of the Australian government of the volume of total tax revenues from these taxes.

The document with long-term budget projections is provided as part of the draft budget documents. There is no mechanism for unscheduled adjustments to existing projections. There is no practice of publishing updates to the current report until the year the next document is prepared. Projections are formed according to the principle of continuity, although comparison with previous projections is carried out only for certain indicators, for

---

[16] NSW Intergenerational report 2016. Budget paper № 5. URL: https://www.treasury.nsw.gov.au/sites/default/files/2017–01/Budget_Paper_5_-_Intergenerational_Report_2016_-_full_report.pdf (accessed on 11.05.2021).

example, for the budget deficit. So, in 2012, the projection of the budget deficit for the long term was estimated at 2.8% of the GRP, and the actual value — 3.4% of the GRP. This change is due to the decisions of the federal government to reduce funding for health care costs, which significantly increased the burden on regional budgets.

The Ministry of Finance does not include information on the forecasting methodology in the document, but this information is presented in the analytical documents of the department. The long-term projection is based on a baseline scenario, although a scenario is presented that lacks the healthy population aging to illustrate the impact of population aging on the fiscal balance. For the budget deficit indicator, the results of a sensitivity analysis to changes in factors such as net population migration at the national level, labor force participation, labor productivity, and efficiency of public service delivery are presented.

There is no information on the use of the results of long-term projections in the process of budgetary or strategic planning.

Canada

A distinctive feature of long-term projections in Canada is the analysis of the state of regional budgets for each constituent entity of the federation in the national Fiscal Sustainability Report. The Budget Office of the Parliament, which prepares this document, considers the issue of inter-budgetary relations and calculates the forecast values of fiscal parameters, as well as the indicator of the fiscal gap for each region over a 75-year horizon. Thus, in the country, the budgetary sustainability of all subjects of the federation in the long term is assessed in a centralized manner, which is advisable in the absence of such an analysis at the subnational level.

The Province of Ontario is the only region where long-term budget projections are being implemented: by the Ministry of Finance since 2005 as part of a document analyzing the state of the regional economy in the long term, by the Committee on Budgetary Responsibility of

the Legislative Assembly of the region since 2017 in the form of an independent document.[17] The basic provisions for the development of the first of the listed documents have been normatively regulated, while the second is being developed within the framework of the general provisions on the functioning of the Committee. The frequency of publication of the document of the Ministry of Finance is linked to the regional general elections, 2 years after which the minister is required to provide an assessment of the state of the economy and demographic characteristics and their potential impact on government finances of the province in the next 20 years. The frequency of preparation of long-term projections of the Committee is not regulated, but, based on current practice, it is 2 year.

Unlike the federal experience, as well as decisions of other countries, the long-term report of the Ontario Treasury does not contain forecast values of budget indicators.[18] Instead of calculated projections for the next 20 years, general directions of changes in regional finance (dynamics of demand for public services, growth of budget revenues, budget balance, public debt), as well as factors affecting this, are formulated. The specification of risks, as well as recommendations for changing the current budgetary policy, are not included in the document. According to the content, the long-term report of the Ontario Ministry of Finance is a long-term socio-economic forecasting document with a detailed analysis of demographic and economic characteristics using a scenario approach.

The Committee's long-term budget projection is more consistent with world practice. The document is being developed for a fixed period until 2050. The current version is built for two scenarios: baseline and alternative, which are highlighted on the

---

[17] Long — term budget outlook. Fiscal implications of the government's program transformation: 2020–2050. Financial Accountability Office of Ontario. 2019. URL: https://www.fao-on.org/web/default/files/publications/EC 1905%20LTBO/LTBO%20Fiscal_2020.pdf (accessed on 13.05.2020).

[18] Ontario's long-term report on the economy. Ministry of finance. 2020. URL: https://files.ontario.ca/mof-long-term-report-book-2020–06–03-en.pdf (accessed on 14.05.2021).

basis of successful long-term maintenance of the achieved medium-term goals that have been set to significantly restrain the growth of budget expenditures in key areas (health care, social security, education). The Committee calculates budget revenue figures (for the baseline scenario only) broken down into three components: provincial tax revenues, federal transfers, and miscellaneous revenues. Cost projections are performed for total program costs, and separately for health, education, miscellaneous, and infrastructure costs for baseline and alternative scenarios. Forecasting methodology disclosed by the Committee in the document.

The Committee focuses on analyzing the results of the baseline and alternative scenarios in terms of indicators of the provincial budget deficit and the dynamics of the level of the public debt of the region but does not calculate indicators of fiscal sustainability. Compared to the long-term projection of the Ministry of Finance, the projection of the Committee is more devoted to assessing the future state of regional finances and is consistent with national and world practice. We also note that the budget projection of the Committee is formed according to the principle of continuity in terms of using the scenario approach and comparing the projection results in the document for 2017 and 2020. In both reports, the criterion for identifying scenarios is a package of budget reforms announced by regional authorities. As in the case of the federal budget projections in Australia, the Committee's projection serves as a certain argument in favor of the implementation of the regional authorities' plans for budget reforms.

The Ontario case is a prime example of how the region is adopting its own vision for long-term projections and fiscal sustainability analysis. The regional executive power does not concentrate on quantitative estimates of the future parameters of the regional budget but formulates general conclusions about the directions of changes in regional finances in connection with the projected changes in the demographic profile of the region and the economy. This solution simplifies the analysis

of the state of regional finances but reduces the practical value of conclusions about long-term trends and issues that may arise. This deficiency is compensated by the developed projections within the legislative branch of government, as well as national projections of the budget parameters of the regions.

European Union
For EU member states, the format, content and frequency of submission of long-term budget projections are determined by supranational regulation by the European Commission. The experience of, for example, Germany and Sweden is interesting, where, in addition to the EU requirements for the analysis of fiscal sustainability within the framework of the annually published Stability Programmes, there is a national practice of long-term budget projections. The listed countries are preparing national documents of long-term budget projections, which are more detailed in comparison with the Stability Programmes.

EU member states, following EU regulation, provide information on the long-term sustainability of national finances until 2070 in the annually published Stability and Convergence programmes. Due to this, the period of long-term fiscal projections and analysis of sustainability at the level of each country is synchronized with the forecast period of the higher level of regulation.

Updating country projections is being implemented according to the publication schedule of the annual Stability Programmes, before which no changes were made to last year's report. Moreover, in the context of the coronavirus pandemic, in accordance with the EU recommendations, the member states of the Union were exempted from the requirement to publish a long-term assessment of fiscal sustainability as part of the Stability Programmes for 2020 and had to focus on the medium-term consequences of the crisis and the accompanying anti-crisis policy. The sustainability programmes prepared in 2021 include information on long-term trends, but in a less detailed format than the pre-crisis programmes.

The Ministry of Finance in *Germany* periodically (on average every 4–5 years) prepares a report on the sustainability of public finances.[19] Contrary to common practice, the last three long-term reports in Germany are not carried over. Long-term budget projections are based on the period for which the population is projected (50 years). As such, the Sustainability Reports for 2011, 2016 and 2020 include projections to 2060. The forecast is based on the country's consolidated budget under two scenarios: optimistic and pessimistic, depending on the long-term dynamics of demographic and economic factors. Medium-term projections of budget parameters for the first 4 years of the 50-year projection period are integrated into the long-term report.

Fiscal sustainability is assessed by calculating the S 2 indicator. The Ministry of Finance is conducting a sensitivity analysis and impact assessment for S 2 due to changes in factors such as fertility, life expectancy, unemployment rate, etc. Based on the forecast results and conclusions regarding the sustainability of public finances in the long term, the report formulates proposals for fiscal measures. social security policy and improvement.

In *Sweden*, the National Institute for Economic Research (NIER), subordinate to the Ministry of Finance, is responsible for the annual preparation of fiscal sustainability reports. The purpose of developing long-term projections is to identify imbalances in the budgetary system at an early stage for necessary adjustments to fiscal policy. Projections are carried out on a scenario basis, calculations are given for 5 alternative scenarios, for example, the absence or slower improvement in the quality of social services, removal of the prerequisite for healthy aging of the population and later retirement, etc.[20]

In general, the document is prepared for the period up to 2100 however, most projections of the dynamics of budget indicators are presented until 2050. Comparisons are made with previous projections, as well as projections prepared by other institutions (for example, the Ministry of Finance). Fiscal sustainability is assessed by calculating the S 2 indicator.[21]

Sweden is good practice when it comes to using the results of long-term projections in the political and budgetary process. The rationale for the chosen value of the fiscal rule in relation to structural surplus during the business cycle[22] or its change[23] is mainly based on the government's ability to respond to long-term demographic challenges. For example, the introduction of the target surplus in 2000 was dictated, inter alia, by the need to achieve long-term sustainability of public finances and respect for the principle of generational equity.

CONCLUSIONS

Based on the results of the analysis of foreign experience in long-term budget projections, we will formulate some solutions that are recommended in order to improve the quality of the relevant documents:

• the planning horizon for the national level can be chosen by analogy with the most widespread in the world practice — 30–50 years, for the subnational level, a similar or smaller (within 20 years) projection horizon seems to be optimal;

• projection is carried out on a sliding basis;

• the mechanism of integration of medium-term projections into documents of long-term budget projections is used. It is worth

---

[19] Report on the Sustainability of Public Finances 2020. Federal ministry of finance, Germany. URL: https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Press_Room/Publications/Brochures/2020–06–25-Sustainability-Report-2020.pdf?__blob=publicationFile & (accessed on 12.05.2021).

[20] The Long-Term Sustainability of Sweden's Public Finances/ The National Institute of Economic Research. 2015;43. URL:

https://www.konj.se/download/18.2de531e0151549bd6822b9af/1448875883622/The-long-term-sustainability-of-swedens-public-finances.pdf (accessed on 14.05.2021).

[21] Fiscal frameworks and fiscal sustainability in Nordics/ Calmfors L. Nordic Council of Ministers. 2020:1–176. URL: http://dx.doi.org/10.6027/Nord2020–004 (accessed on 14.05.2021).

[22] The Swedish Fiscal Policy Framework. Ministry of Finance, Sweden. 20211. URL: www.government.se/sb/d/14625/a/164299 (accessed on 13.05.2021).

[23] A new surplus target. The Swedish Economy. The National Institute of Economic Research. 2016. URL: https://www.konj.se/download/18.4ff3f2ff156ddcbd8252ef0a/1472651484546/A-new-surplus-target.pdf (accessed on 13.05.2021).

considering the practice of some developed economies, where medium-term projections prepared within the framework of the budgetary process are developed for a 10-year period;

• documents of long-term budget projections include a comparative analysis of previously made projections. Any changes from previous projections are justified in the document. Thus, the continuity of the developed projections is ensured, as well as the basis for assessing the projection quality is formed;

• the general approach and projection methodology, as well as their changes in comparison with previously published projections, are disclosed in the long-term projection document. Such a solution increases the transparency and quality of projection documents. There is a widespread practice of publishing basic information about the assumptions used and adjusting them as part of projection documents. Specification of the calculation methodology can be implemented in the methodological materials of the responsible executor;

• the most common frequency of publication of long-term budget projections is annual. Such a solution, firstly, makes the long-term projection tool more flexible; secondly, it eliminates the need to introduce a mechanism for unscheduled adjustments to the published projection; thirdly, it makes it possible to timely illustrate the current demographic, economic, and political changes;

• development of a scenario-based projection. This solution allows outlining the directions of changes in the main fiscal indicators under certain conditions. The identification of scenarios should be carried out according to the same principle in the documents of long-term projections to ensure the comparability of forecasts, and their number should be limited;

• analysis of the sensitivity of the constructed projections to fluctuations in the values of determining factors of a demographic and economic nature. Evaluation of changes in fiscal parameters in response to changes in exogenous variables makes it possible to determine the limits within which budget parameters may be located, including in the event of shocks;

• ensuring the responsibility of the department — the developer of the long-term projection document for the quality of forecasts. To this end, it is important to introduce monitoring and evaluation of long-term budget projections according to criteria such as the feasibility and accuracy of forecasts, compliance with legal regulations, transparency of projection methodology, continuity of forecasts, and justification of any changes and adjustments. If the projections do not meet the listed criteria, then a public report of the department with appropriate explanations should be provided;

• using the results of long-term projections in the development and selection of political decisions. The rationale for certain reforms should include the long-term impact on the state of public finances, including their sustainability. The successful practice of long-term projections is found in Australia, Germany, and Sweden. It is not recommended to use the planned reforms as a criterion for identifying scenarios, since such an approach is not relevant in the framework of several consecutively published projection documents and will lead to incomparability of the latter;

• inclusion in long-term budget projections of an assessment of fiscal sustainability, for example, by calculating the size of the fiscal gap at the end of the projection period. Concluding that the fiscal system is unstable in the long term, the document includes conclusions on the necessary changes in fiscal policy.

The listed solutions can be considered as characteristics of the quality of documents for long-term budget projections. Changing existing practices, considering the mechanisms listed above, will facilitate the introduction of long-term projections as an active tool in fiscal policy at all levels of government, instead of the current function of a source of additional information, weakly related to policy decisions.

Considering the best solutions from world

practice listed in this article, in further work it is advisable to formulate directions for adjusting the Russian approach to long-term budget projections at the federal and regional levels. To change the role of the instrument, it is proposed to focus on the vision of developed countries: long-term budget projections allow analyzing socio-economic trends, assessing the implementation of external and internal risks, and calculating the consequences of political decisions in projection onto the budgetary system. A long-term budget projection is not a plan for the values of long-term budget parameters, but a complex, analytically developed document showing the impact of future demographic and economic trends on the state of public finances. The main purpose of forecasting is to identify potential risks to the balance and sustainability of the budget system, which should be considered when making political decisions.

Proposals for improving long-term projections in Russia include expanding the projection horizon to at least 30–40 years at the federal level and up to 20 years at the regional level with a revision of the frequency of publication of projections in favor of more frequent development of a document. Such a change requires expanding the strategic planning horizon, on the basis of which budget projections are developed. The documents should be formed on the basis of continuity, and not from scratch, and compared with previously published budget projections, followed by substantiation of discrepancies in the values obtained. Developing a forecasting quality control mechanism will also help change the instrument's role in fiscal policy. In connection with the generally recognized high uncertainty of long-term projections, it is important to assess the impact of changes in external factors on the parameters of the budget. The introduction of the global assessment of the sensitivity of budget projections into Russian practice will make it possible to determine exogenous factors, the shocks of which will most strongly affect the state of the budget system.

REFERENCES

1. Woods M. Projecting long-term fiscal outcomes. In: Podger A., Su T.-T., Wanna J. et al., eds. Value for money: Budget and financial management reform in the People's Republic of China, Taiwan and Australia. Canberra: ANU Press; 2018:43–63. URL: https://press.anu.edu.au/downloads/press/n4096/pdf/ch03.pdf (accessed on 15.04.2021). DOI: 10.22459/VM.01.2018.03

2. Schick A. Sustainable budget policy: Concepts and approaches. *OECD Journal on Budgeting*. 2006;5(1):107–126. URL: https://www.oecd.org/gov/budgeting/43481125.pdf (accessed on 15.04.2021).

3. Shakhova G. Ya. Long-term budget planning methodology development specifics: The international experience. *Finansovyi zhurnal = Financial Journal*. 2009;(2):99–108. (In Russ.).

4. Shakhova G. Ya., Manenok P. L. Long-term budget projections in U.S. federal agencies. *Finansovyi zhurnal = Financial Journal*. 2014;(3):121–133. (In Russ.).

5. Shakhova G. Ya., Kradinov P. G., Manenok P. L. Long-term sustainability of the budget system. *Finansovyi zhurnal = Financial Journal*. 2012;(4):5–18. (In Russ.).

6. Shakhova G. Ya. Modern trends in the methodology of budget forecasting. *Finansovyi zhurnal = Financial Journal*. 2013;(4):61–70. (In Russ.).

7. Anderson B., Sheppard J. Fiscal futures, institutional budget reforms, and their effects: What can be learned? *OECD Journal on Budgeting*. 2009;(3):7–117. URL: https://www.oecd.org/gov/budgeting/46051529.pdf (accessed on 5.04.2021).

8. Kudrin A.L. Theoretical and methodological approaches to the implementation of a balanced and effective budget policy. Doct. econ. sci. diss. Moscow: RANEPA; 2018. 424 p. URL: https://www.ranepa.ru/upload/iblock/b84/kudrin-a-l-dissertation.pdf (accessed on 15.06.2021). (In Russ.).

9. Goryunov E.L. Assessment of the long-term sustainability of fiscal policy in Russia using the budget gap indicator. Cand. econ. sci. diss. Moscow: RANEPA; 2021. 186 p. URL: https://www.ranepa.ru/upload/iblock/aa7/goryunov-e-l-dissertation.pdf (accessed on 15.06.2021). (In Russ.).

10. Allenov Yu.A., Kradinov P.G., Shakhova G. Ya. Long-term financial plan: Regional level development. *Finansovyi zhurnal = Financial Journal.* 2011;(4):97–108. (In Russ.).

11. Arlashkin I. Yu., Deryugin A.N., Proka K.A. Development of long-term budget outlook: Regional aspect. *Finansovyi zhurnal = Financial Journal.* 2015;(3):63–74. (In Russ.).

12. Semibratskii M.V. Development of the budgetary strategy of the region: Theoretical and applied aspects. Cand. econ. sci. diss. Belgorod: Belgorod National Research University; 2015. 175 p. (In Russ.).

13. Guillemette Y., Turner D. The fiscal projection framework in long-term scenarios economics. OECD Economics Department Working Papers. 2017;(1440). URL: https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ECO/WKP(2017)72&docLanguage=En (accessed on 27.04.2021).

14. Ulla P. Assessing fiscal risks through long-term budget projections. *OECD Journal on Budgeting.* 2006;6(1):127–187. URL: https://www.researchgate.net/publication/227461781_Assessing_Fiscal_Risks_through_Long-Term_Budget_Projections (accessed on 2.05.2021).

15. Horne J. Indicators of fiscal sustainability. IMF Working Paper. 1991;(5). URL: https://www.elibrary.imf.org/view/journals/001/1991/005/article-A001-en.xml

16. Blanchard O., Chouraqui J.-C., Hangemann R., Sartor N. The sustainability of fiscal policy: New answers to an old question. *OECD Economic Studies.* 1990;(15):7–36. URL: https://www.oecd.org/tax/public-finance/34288870.pdf

ABOUT THE AUTHORS

Natal'ya E. Barbashova — Cand. Sci. (Econ.), Senior Researcher, Institute of Applied Economic Research, Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia; Financial Research Institute Ministry of Finance of Russia, Moscow, Russia
barbashova-ne@ranepa.ru

Anna N. Komarnitskaya — research fellow, Institute of Applied Economic Research, Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia
komarnitskaya-an@ranepa.ru

The article was submitted on 01.06.2021; revised on 14.06.2021 and accepted for publication on 27.09.2021.
The authors read and approved the final version of the manuscript.