INTERNATIONAL MONETARY FUND

IMF Country Report No. 25/249

NORWAY

SELECTED ISSUES

August 2025

This paper on Norway was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on July 30, 2025.

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July 30, 2025

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European Department

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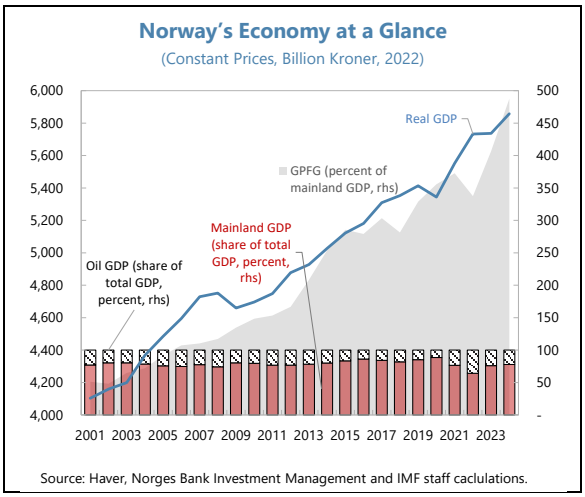
ENHANCING NORWAY'S FISCAL FRAMEWORK: STRENGTHENING EXPENDITURE EFFICIENCY AND COUNTERCYCLICALITY[1]

A. Introduction

1. Norway has benefited significantly from its current fiscal framework, which has steadily transformed oil revenues into long-term financial assets and has allowed the government to stabilize the economy amid severe shocks. Over time, this framework has enabled the systematic accumulation of wealth in the Government Pension Fund Global (GPFG), whose value reached about 490 percent of mainland GDP in 2024, up from about 400 percent of mainland GDP in 2023.[2] The fiscal framework aims to ensure intergenerational equity by accumulating savings and guiding medium-term GPFG transfers which are used to cover the structural non-oil budget deficit (the transfers are set around 3 percent of the fund's value at the end of the previous year, corresponding to its expected real return over the long term). At the same time, the fiscal rule allows automatic stabilizers to function effectively, thereby helping to counteract adverse shocks. Additionally, the flexibility to retain and withdraw funds from the GPFG as needed to meet the structural balance rule is a hallmark feature of this framework, showcasing a well-balanced approach to fiscal management that is both prudent and exemplary.



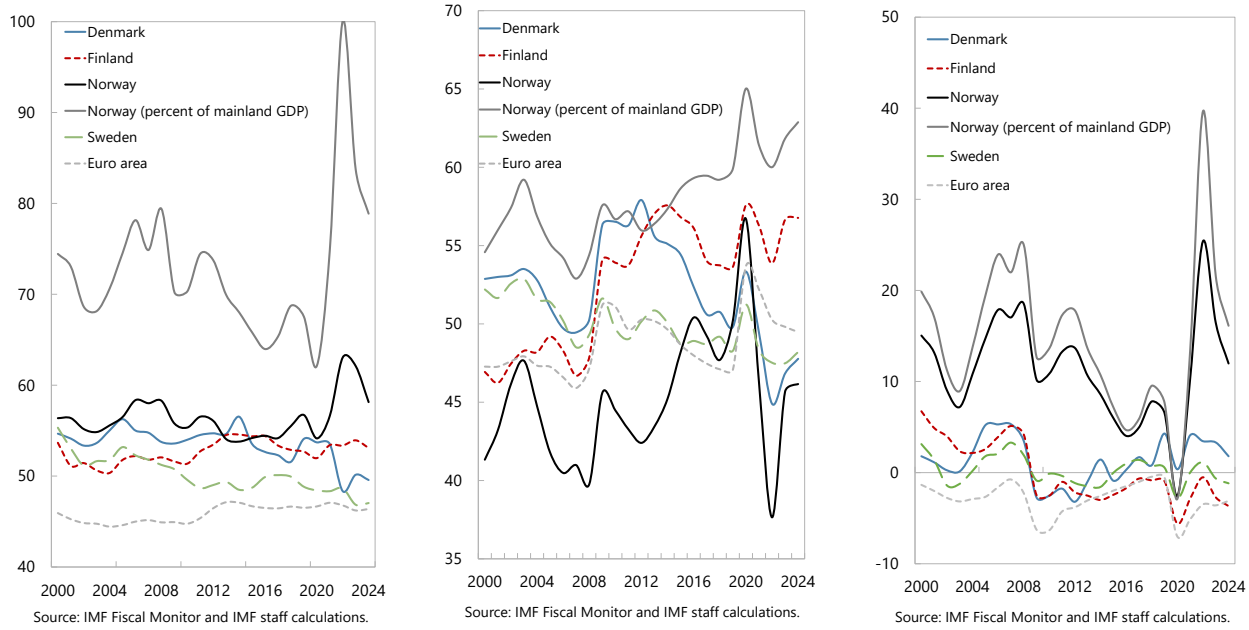
2. Norway's fiscal sustainability remains strong but elevated public spending and rising non-oil deficits, financed through the GPFG, underscore potential vulnerabilities. Norway's GPFG value has expanded significantly in recent years, mainly due to large and consistent transfers from oil and gas revenues, and strong investment returns. This has meant larger fiscal envelopes via growing GPFG transfers (currently about one third of total revenues) and procyclicality of fiscal policy. However, pressures on fiscal balances are expected to intensify as oil production is forecast to peak in the near term and decline thereafter. On the expenditure side, Norway's public spending levels are higher than those of many peer countries, particularly in areas such as health and social protection. Moreover, demographic headwinds will drive up aging-related spending. Also, according to the Norway's long term defense plan, defense spending is expected to increase and remain higher

[1] The authors thank Raphael Lam (FAD) for his valuable insights and extensive feedback.

[2] Over time, as the petroleum sector's role diminishes, mainland GDP will increasingly approximate total GDP.

over the medium term[3]. As the GPFG's growth has supported higher fiscal spending, structural non-oil budget deficits as a share of mainland GDP have increased substantially over the years (forecasted to reach about 13 percent of mainland GDP in 2025, nearly three times its level in 2010.) and are likely to continue growing.[4] Under current policies, this raises the risk of a sudden fiscal adjustment or excessively drawing down of GPFG assets if the value of the GPFG declines appreciably.

General Government: Fiscal Outcomes
(In percent of GDP)



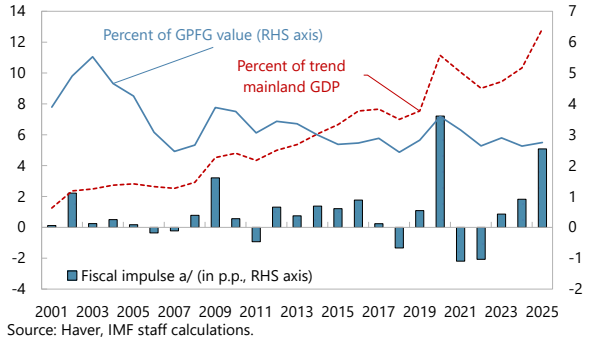
Source: IMF Fiscal Monitor and IMF staff calculations.

3. Against this background, Norway's fiscal framework should be enhanced to better address increasing and procyclical spending trends, while maintaining fiscal sustainability. Under the current structural rule, withdrawals from the GPFG are guided by the expected real return over the long term, currently estimated at 3 percent of the fund's value. This rule is widely regarded as contributing to the preservation of intergenerational equity by ensuring prudent management of Norway's financial assets and oil and gas wealth. However, as natural resources are increasingly transformed into financial assets, this approach could lead to procyclicality of the structural non-oil

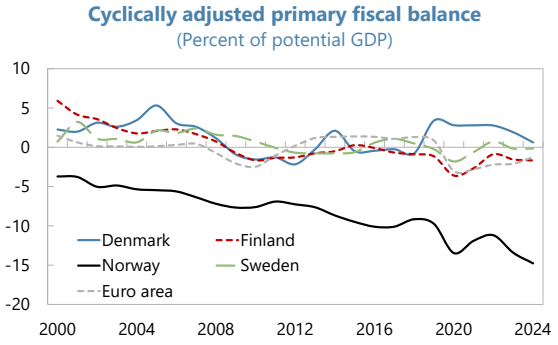
[3] Defense spending was 2.2 percent of GDP in 2024 and, according to the Norwegian Defense Pledge, is planned to be increased by about 600 Kroner Billion until 2036, about 11.5 percent of 2024 GDP.

[4] Also, contrary to common perception, the fiscal rule has not fully insulated fiscal policy from commodity price volatility. Some studies suggests that fiscal policy has been more (not less) procyclical with commodity prices since the adoption of the rule. See for example Bjørnland H. and Thorsrud L., 2019. Using a time-varying Dynamic Factor Model estimated for Norway, in which both the volatility of structural shocks and the systematic fiscal policy responses are allowed to change over time, the authors analyze how the adoption of a fiscal rule insulates the domestic economy from commodity price fluctuations in a resource-rich economy.

fiscal deficit tied to the GPFG's rapid growth. For instance, a sustained decline in oil prices or a sudden financial market downturn could significantly erode the GPFG's value and reduce future returns. In either scenario, the associated reduction of GPFG transfers may result in forced government spending cuts (which may be, for example, procyclical or politically unsustainable). Moreover, with fiscal expenditures increasingly outpacing the growth of the non-oil economy, fiscal policy has increasingly relied on GPFG transfers (covering near 20 percent of expenditures in 2024), raising concerns about dependence on GPFG financing and inefficient expenditures. These concerns could be addressed by (i) enhancing the current fiscal rule to incorporate direct control of expenditures and efficiency considerations, thereby helping contain the expansion of fiscal deficits; (ii) adopting a medium-term fiscal anchor in the form of a medium-term expenditure rule to better safeguard against these risks; and (iii) recalibration of the withdrawal rate of the current fiscal rule. While the last option could, in principle, be used to reduce procyclicality—by lowering the withdrawal rate during asset booms and raising it in downturns—it has drawbacks. For example, frequent adjustments would undermine the credibility and simplicity of the rule and could prove politically difficult to operationalize. Medium-term expenditure frameworks are designed to extend the fiscal planning horizon beyond the annual budget cycle, thereby promoting fiscal discipline, improving budget credibility, and aligning expenditures with strategic policy priorities.[5]



Source: Haver, IMF staff calculations.
a/ Fiscal impulse is defined as the change in structural non-oil deficit in percent of trend mainland GDP.



Source: IMF Fiscal Monitor and IMF staff calculations.
For Norway, cyclically adjusted non-oil primary balance as a percent of non-oil potential GDP.

4. Reforming Norway's fiscal rule faces political economy challenges. While there is strong support for maintaining the GPFG as a long-term savings vehicle to safeguard intergenerational equity, public debates have increasingly focused on whether more of the GPFG's returns should be used to meet current social and investment needs, such as climate initiatives, welfare programs, or infrastructure spending. These calls often reflect a short-term orientation that prioritizes immediate demands over long-term fiscal resilience. As a result, proposals to revise or strengthen the fiscal rule move towards greater commitment to address future liabilities are likely to encounter political

[5] Some quantitative benefits of introducing multiyear budgets can be found in Vlaicu et al. (2014). Their results show that, on average, multiyear budgeting improves budget balance by about 2 percentage points and reduce health spending volatility. Considerations for the design and implementation of medium-term fiscal frameworks can be found in Curristine et al. (2024) IMF-How to Notes.

resistance, particularly if perceived as limiting access to GPFG resources or curbing fiscal flexibility for higher current spending.

5. The rest of the analysis is organized as follows. Section II summarizes the main lessons and findings from the fiscal frameworks of selected advanced economies, including their experience with implementing expenditure rules. Section III discusses expenditure and revenue trends as well as fiscal policy cyclicality in Norway over time, providing also cross-country comparison. Section IV provides scenario analysis (partial equilibrium) to assess the implications of complementing/adjusting the current Norway fiscal rule on the public finances over the longer term. Section V summarizes the key findings and offers some policy conclusions.

B. Fiscal Frameworks and Expenditure Rules: Lessons from Select European Countries

6. Expenditure rules have become an increasingly important element of fiscal frameworks in advanced economies, enhancing fiscal credibility and macroeconomic stability. They have served as operational anchors to enhance fiscal discipline while maintaining flexibility for countercyclical policies. In contrast to traditional deficit- and debt-based rules, which could lead to procyclical fiscal policies, well-designed expenditure rules provide a more predictable and transparent mechanism for managing public finances over the medium term. The analysis highlights the Nordic experience, where expenditure ceilings have been instrumental in anchoring fiscal policy within medium-term budgetary frameworks. Additionally, the recent evolution of EU fiscal rules has seen the integration of explicit expenditure-based constraints, alongside existing debt and deficit targets, aiming to enhance fiscal credibility and macroeconomic stability.

Nordic Experience with Expenditure Rules: Principles and Main Characteristics

7. Nordic countries have long employed multi-annual expenditure ceilings to reinforce budget discipline. Sweden first adopted these ceilings in the late 1990s and has continuously used them ever since. Finland initially tested expenditure controls in the 1990s but formalized the present spending-limit system in 2003, establishing real-term limits set for each four-year parliamentary term. Denmark's ceilings were introduced via legislation in 2012 and took effect from 2014. As of 2024, they adhere to the revised EU fiscal framework under the Stability and Growth Pact (SGP), which replaces uniform deficit and debt limits with country-specific debt sustainability criteria. While each has already established its own ceilings-based approach, they must now align these existing rules with the new EU-wide net expenditure requirements. This process does not entail discarding current practices, but rather ensuring their consistency with the reformed SGP.

8. The Nordic expenditure rule frameworks emphasize fiscal discipline through multi-annual expenditure ceilings, while allowing policy flexibility and enhancing credibility. In general, most discretionary spending falls within these ceilings. However, cyclically sensitive items—such as interest payments and certain entitlement expenditures—are typically excluded to allow automatic stabilizers to operate effectively. Compliance mechanisms vary across countries but generally rely on a combination of legal or political commitments, internal controls, and independent

oversight bodies to ensure adherence. These frameworks aim to strike a balance between expenditure control and countercyclical flexibility, reinforcing fiscal sustainability while allowing governments to respond to economic fluctuations. Table 1 below summarizes the main characteristics of expenditure rules in the Nordic countries.

Table 1. Norway: Main Characteristics of Expenditure Rules in the Nordic Countries

Country	Implementation year	Legal/Political Basis	Main Parameters	Compliance & Monitoring
Denmark	2012	Organic Budget Law	- Nominal expenditure ceilings. - Four-year binding periods. - Coverage: Central, municipal, and regional spending. - Mechanisms for economic sanctions on breaches.	Legally binding; strict enforcement through budget management and economic sanctions.
Sweden	1997	Organic Budget Law	- Rolling expenditure ceilings for central government and pension systems. - Ceilings set for the third fiscal year ahead. - Excludes interest payments and selected volatile items.	Politically endorsed with annual updates; independent oversight through fiscal monitoring.
Finland	Transition in 2003	Legislative reforms	- Real-term expenditure caps on primary non-cyclical central government spending. - Applied for the full electoral term. - Excludes cyclically sensitive items and volatile entitlement expenditures.	Monitored via internal controls and periodic fiscal reviews; politically committed framework.

Source: Adapted from Ljungman, IMF WP/08/282 (2008), IMF Technical Assistance Reports (2023 and 2024).

Expenditure Rules in the EU: Principles and Main Characteristics

9. To safeguard macroeconomic stability and enforce fiscal discipline, the SGP was originally designed to enforce nominal deficit and debt limits. However, these constraints have at times contributed to procyclical fiscal policies.[6] During economic upswings, rising revenues facilitated higher public spending, while in downturns, rigid fiscal constraints sometimes necessitated spending cuts, exacerbating economic contractions. Moreover, the reliance on annual fiscal targets weakened medium-term fiscal planning, reducing predictability and limiting the effectiveness of

[6] The Stability and Growth Pact (SGP) was introduced in 1997 to enforce fiscal discipline across EU member states by setting explicit deficit and debt limits—a general government deficit not exceeding 3 percent of GDP and public debt below 60 percent of GDP.

expenditure control measures. Although flexibility was introduced through escape clauses and corrective mechanisms, their enforcement remained inconsistent across countries. As a result, the framework struggled to balance countercyclical flexibility with long-term fiscal sustainability (European Commission, 2010 and 2023; OECD, 2012; IMF, 2022).

10. Recognizing these shortcomings, the EU adopted a reformed fiscal framework in 2024, introducing expenditure rules as operational targets, while maintaining deficit and debt limits. The revised framework[7] establishes a multi-year net primary expenditure path, designed to strengthen fiscal sustainability, while preserving space for strategic investments. Unlike the previous approach—where expenditure growth was indirectly constrained through deficit and debt ceilings—the reformed framework explicitly limits net expenditure growth over a defined period (4- or 7-year intervals), reinforcing fiscal discipline. Targeted exemptions, including for EU-funded programs and green investments, allow for necessary policy flexibility. By mitigating the procyclicality of earlier rules, the revised framework aims to foster a more stable and predictable fiscal policy environment (European Parliament Press Release, 2024).

11. The new framework also enhances flexibility mechanisms, enabling member states to respond to economic shocks, while ensuring long-term fiscal sustainability. These include escape clauses that allow temporary deviations from the expenditure path during periods of severe economic stress and a correction mechanism to ensure that short-term deviations are offset over the medium term. Additionally, the revised rules strengthen the integration of macro-fiscal forecasts, aligning expenditure paths with cyclical conditions and structural fiscal trends. This evolution in the EU's fiscal architecture offers valuable insights for other advanced economies (Table 2 underscores the differences between the previous EU fiscal rules and the current framework). For example, for Norway, linking expenditure growth to non-oil GDP trends could help insulate fiscal policy from fluctuations in GPFG returns (IMF Technical Assistance Report—Poland, 2024; IMF Technical Assistance Report—Slovak Republic, 2023).

[7] See European Parliament and Council (2024a, 2024b and 2024c).

Table 2. Norway: Comparison of Legacy EU Fiscal Rules vs. Recent EU Expenditure Rules

Feature	Legacy EU Fiscal Rules (SGP)	Recent EU Expenditure Rules (2024)
Fiscal Target[1]	Deficit and debt ratios (3 percent deficit; 60 percent debt).	Deficit and debt targets remain but are now complemented by a multi-year net primary expenditure path.
Coverage	Comprehensive coverage of overall fiscal outcomes (revenue and debt focused).	Explicit limit on expenditure growth, with exclusions for strategic investments.
Time Horizon	Annual targets with short-term adjustments.	Binding multi-year framework (typically four years) with a forward-looking approach.
Flexibility Mechanisms	Escape clauses and corrective measures for severe shocks; limited flexibility.	Enhanced escape clauses and correction mechanisms that adjust for economic shocks and forecast errors.
Integration with Forecasts	Limited incorporation of macro-fiscal forecasts; focus on current fiscal outcomes.	Incorporates a forward-looking, risk-based approach grounded in country-specific debt sustainability analysis (DSA) to guide multi-annual adjustment paths.
Monitoring & Oversight	National compliance monitored through domestic oversight and occasional reviews.	Enhanced dialogue between national authorities and EU institutions; independent oversight to ensure consistency with the EU net expenditure path.

Source: European Commission (2010); Evaluation of the Stability and Growth Pact. European Parliament Press Release (2024); New EU Fiscal Rules Approved by MEPs. OECD (2012); Fiscal Rules and Macroeconomic Performance. IMF Technical Assistance Report—Republic of Poland (2024) IMF Technical Assistance Report—Slovak Republic (2023).

[1] The 60 percent debt-to-GDP ratio is a reference value under both the legacy and reformed EU fiscal frameworks. While not a binding ceiling, it serves as a benchmark for assessing debt sustainability and guiding fiscal adjustment paths.

Mechanisms to Strengthen Expenditure Efficiency and Quality

12. Ensuring expenditure rules yield effective fiscal outcomes requires robust, evidence-based spending practices. Building on the lessons from Nordic peers and the broader European shift toward multi-year expenditure ceilings, this subsection underscores the importance of integrating best practices in spending efficiency and administration into any new expenditure rules. The experiences of other countries reveal tools and principles to enhance expenditure quality, while helping ensure fiscal discipline over the long run. Ensuring that public spending remains effective and well-targeted is crucial to upholding credible fiscal frameworks over the long term (IMF, 2022). Below are high-level principles and considerations based on international best practices:

Strengthen Performance-Focused Budgeting

- *Link budgets to outcomes*. Embedding explicit performance targets into multi-year budget planning helps decision-makers focus on measurable results (IMF, 2022). This approach can also clarify trade-offs among competing policy priorities.

- *Conduct periodic spending reviews*. Recurring, structured reviews of major government programs—coordinated with the budget cycle—enable policymakers to identify and scale back inefficient spending, reallocating resources to areas yielding higher social and economic returns (Nordic Council of Ministers, 2020).

Promote Rigorous Public Investment Management

- *Improve project appraisal*. Formal cost-benefit analyses (CBA) and feasibility studies across ministries can help governments select projects with high potential for lasting societal gains (OECD, 2022).

- *Enhance accountability*. Transparent procurement processes and thorough post-completion audits help avert excessive costs and build public trust in how resources are allocated (European Commission, 2010).

Advance Digital Innovation in Public Services

- *Promote digital transformation*. Expanding e-government portals and shared IT platforms can reduce administrative burdens and broaden citizens' access to services (OECD, 2022).

- *Foster efficiency gains*. Encouraging the adoption of new technologies—alongside data analytics—allows agencies to deliver more with fewer resources while maintaining strong service quality.

Foster Accountability and Transparency

- *Clear performance reporting*. Publishing user-friendly summaries of progress toward service delivery goals helps legislatures and citizens hold public entities accountable (Nordic Council of Ministers, 2020).

- *Strengthen oversight*. Empowering independent scrutiny bodies—such as parliamentary committees or fiscal councils—with the authority to assess expenditure decisions can detect inefficiencies early (IMF, 2022).

Incentivize Efficiency within Medium-Term Budgeting

- *Embed savings targets*. Setting modest but consistent "efficiency dividends" in multi-year spending plans keeps a focus on cost containment, preserving fiscal space for priority initiatives (European Commission, 2010).

- *Phase reforms pragmatically*. Gradual implementation of efficiency measures, accompanied by clear communication to stakeholders, helps maintain essential services, while building support for reform.

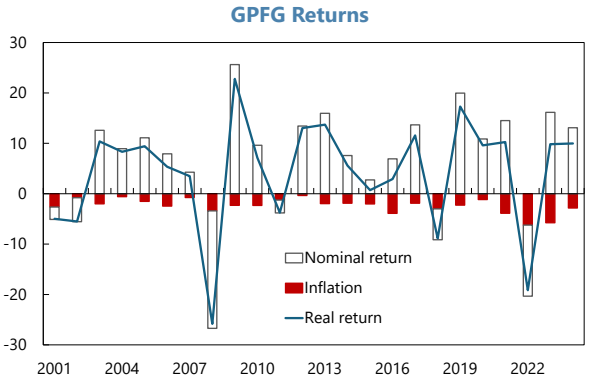
13. When well-designed, these approaches can yield durable gains in expenditure quality and cost-effectiveness, reinforcing the credibility of fiscal frameworks. At the same time, policymakers must remain attentive to potential pitfalls: overly rigid rules can hamper the ability to adapt to changing needs, while insufficient transparency and oversight can undermine reform momentum. Striking a balance between flexibility and accountability is thus key to ensuring that expenditure policies both address present demands and maintain long-term fiscal sustainability.

C. Trends and Cross-Country Comparisons of Norway's Fiscal Accounts

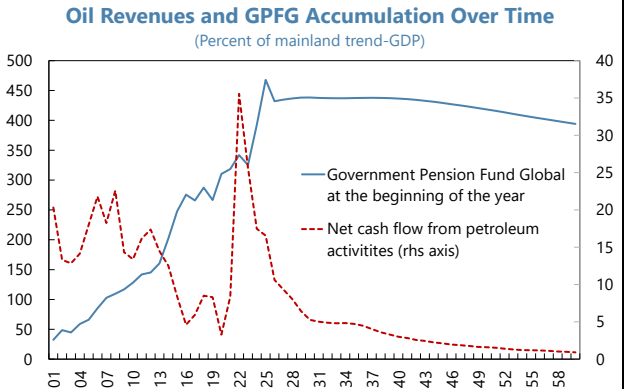
14. Petroleum revenues and the GPFG have been central to Norway's fiscal framework, providing a stable source of financing for the structural non-oil deficit. The country's fiscal framework has evolved around the management of these revenues, leading to the accumulation of financial assets in the GPFG, now the largest sovereign wealth fund globally. Since 2001, the fiscal rule, through the GPFG, has played a central role in anchoring fiscal policies and financing public needs. Norway's fiscal trajectory has been shaped by the evolution of the GPFG. This section examines the significance of petroleum revenues and the GPFG, analyzes public expenditure trends and efficiency, and assesses the cyclicality of fiscal policy in response to both GDP and GPFG fluctuations. By drawing on cross-country data and empirical analysis, the section aims to provide insights into how Norway's fiscal dynamics can be further strengthened to address emerging challenges (IMF, 2022; OECD, 2022).

Fiscal Revenues and the Significance of Oil and the Government Pension Fund Global

15. Norway's fiscal revenues reflect a combination of high taxation and resource wealth transfers, with petroleum revenues transforming into financial assets within the GPFG (Annex 1). Since its establishment, the GPFG has grown significantly, reaching approximately 490 percent of mainland GDP in 2024, driven by consistent inflows from petroleum revenues and strong investment returns. The fund's annualized real return has averaged about 4 percent since 1998, reflecting its robust long-term performance. However, the relatively stable overall annualized rate masks highly volatile real and nominal annual returns, with significant fluctuations tied to global financial market conditions. This volatility underscores the risks associated with relying on the GPFG value as a primary fiscal buffer, as sharp declines in its value could necessitate abrupt adjustments to public spending. Moreover, the importance of the oil sector as a contributor to the overall economy and to the value of the GPFG is expected to shrink over time, as oil production is forecast to peak and decline in the coming years (Bjørnland and Thorsrud, 2019; IMF, 2022).



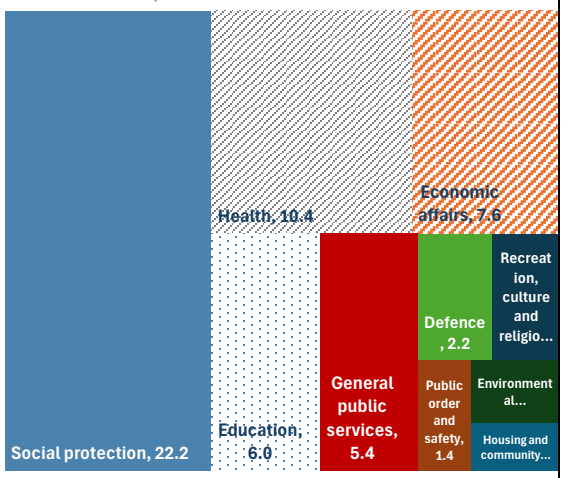
Source: Norwegian authorities and IMF staff calculations.
Inflation is shown with a negative sign.



Source: Norwegian authorities and IMF staff calculations.

Public Expenditure Trends and Cross-Country Comparisons

16. Norway's central government expenditure has risen substantially since 2001—nearly quadrupling in nominal terms—with transfers to households and other entities outpacing operating costs and capital formation. These rapidly rising transfers largely mirror strong commitments to social welfare, as evident in the high shares of total spending allocated to health and social protection. As of 2022, health and social protection spending amounted for about 1/3 of general government expenditures.



17. Comparative cross-country data indicate that Norway's total public spending stands out among advanced economies, with social protection and health continuing to account for substantial outlays. Over 2010–19, total government expenditure relative to mainland GDP rose steadily, underpinned by robust welfare commitments and expanding allocations to core public services. From 2020 onward, pandemic-related spending placed further upward pressure on expenditures, although a sharp increase in petroleum revenues partly offset the impact of higher outlays and global financial volatility.

Table 3. Norway: Heatmap of General Government Expenditures by Function
(In percent of GDP)

	2001						2019						2022					
Highest value / Lowest value	EA20	Denmark	Finland	Sweden	**Norway** (percent of mainland GDP)	**Norway**	EA20	Denmark	Finland	Sweden	**Norway** (percent of mainland GDP)	**Norway**	EA20	Denmark	Finland	Sweden	**Norway** (percent of mainland GDP)	**Norway**
Total	47.0	52.8	47.3	52.6	57.2	44.1	46.9	49.7	53.3	49.7	59.9	51.1	50.2	45.0	53.3	48.9	59.5	38.4
General public services	7.8	8.4	7.4	7.0	7.3	5.6	5.8	5.9	8.0	5.3	5.6	4.7	6.1	5.8	7.7	5.1	5.4	3.5
Defence	1.3	1.5	1.3	2.0	2.3	1.7	1.2	1.1	1.2	1.2	2.2	1.9	1.2	1.2	1.3	1.7	2.2	1.4
Public order and safety	1.6	0.9	1.3	1.3	1.3	1.0	1.7	1.0	1.2	1.3	1.4	1.2	1.7	0.9	1.1	1.4	1.4	0.9
Economic affairs	4.6	3.4	4.6	3.8	6.1	4.7	4.3	3.1	4.2	4.8	7.0	5.9	5.8	2.9	4.6	5.4	7.6	4.9
Environmental protection	0.8	0.6	0.3	0.4	0.7	0.5	0.8	0.4	0.2	0.5	1.1	0.9	0.8	0.4	0.2	0.6	1.3	0.8
Housing and community amenities	0.9	0.5	0.4	0.8	0.4	0.3	0.6	0.2	0.3	0.7	1.0	0.8	1.0	0.2	0.4	0.7	1.0	0.6
Health	6.3	6.9	5.8	6.3	9.2	7.1	7.1	8.4	7.1	7.1	10.1	8.6	7.9	8.0	7.4	7.1	10.4	6.7
Recreation, culture and religion	1.1	1.6	1.1	1.4	1.7	1.3	1.1	1.6	1.5	1.4	2.1	1.8	1.1	1.4	1.4	1.4	2.0	1.3
Education	4.7	6.4	5.9	7.3	7.1	5.5	4.6	6.3	5.6	7.6	6.5	5.6	4.6	5.3	5.5	7.1	6.0	3.9
Social protection	17.8	22.7	19.2	22.2	21.3	16.4	19.7	21.7	24.1	19.6	22.9	19.5	19.9	18.9	23.5	18.4	22.2	14.3

Source: Eurostat and IMF staff calculations.
Cell shading reflects relative spending levels within each row and year across countries. Darker red indicates higher expenditure as a percentage of GDP, based on a continuous gradient. White cells represent the lowest value in a given year and expenditure item across countries.

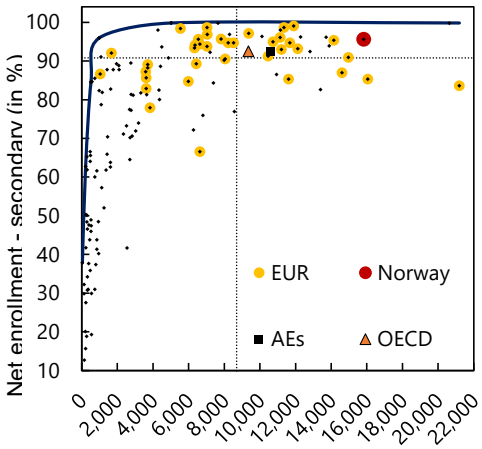
Table 4. Norway: Heatmap of the Change in General Government Expenditures by Function
(Percentage points of GDP)

	Change between 2001 and 2019						Change between 2001 and 2022					
Highest value / Lowest value	EA20	Denmark	Finland	Sweden	**Norway** (percent of mainland GDP)	**Norway**	EA20	Denmark	Finland	Sweden	**Norway** (percent of mainland GDP)	**Norway**
Total	-0.1	-3.1	6.0	-2.9	2.7	7.0	3.2	-7.8	6.0	-3.7	2.3	-5.7
General public services	-2.0	-2.5	0.6	-1.7	-1.7	-0.9	-1.7	-2.6	0.3	-1.9	-1.8	-2.1
Defence	-0.1	-0.4	-0.1	-0.8	-0.1	0.2	-0.1	-0.3	0.0	-0.3	-0.1	-0.3
Public order and safety	0.1	0.1	-0.1	0.0	0.2	0.2	0.1	0.0	-0.2	0.1	0.1	-0.1
Economic affairs	-0.3	-0.3	-0.4	1.0	0.9	1.2	1.2	-0.5	0.0	1.6	1.6	0.2
Environmental protection	0.0	-0.2	-0.1	0.1	0.4	0.4	0.0	-0.2	-0.1	0.2	0.6	0.3
Housing and community amenities	-0.3	-0.3	-0.1	-0.1	0.6	0.5	0.1	-0.3	0.0	-0.1	0.6	0.3
Health	0.8	1.5	1.3	0.8	0.9	1.5	1.6	1.1	1.6	0.8	1.1	-0.4
Recreation, culture and religion	0.0	0.0	0.4	0.0	0.5	0.5	0.0	-0.2	0.3	0.0	0.3	0.0
Education	-0.1	-0.1	-0.3	0.3	-0.5	0.1	-0.1	-1.1	-0.4	-0.2	-1.0	-1.6
Social protection	1.9	-1.0	4.9	-2.6	1.6	3.1	2.1	-3.8	4.3	-3.8	0.9	-2.1

Source: Eurostat and IMF staff calculations.
Cell shading reflects relative spending levels within each row and year across countries. Darker red indicates higher change in expenditure as a percentage of GDP, based on a continuous gradient. White cells represent the lowest value in a given year and expenditure item across countries.

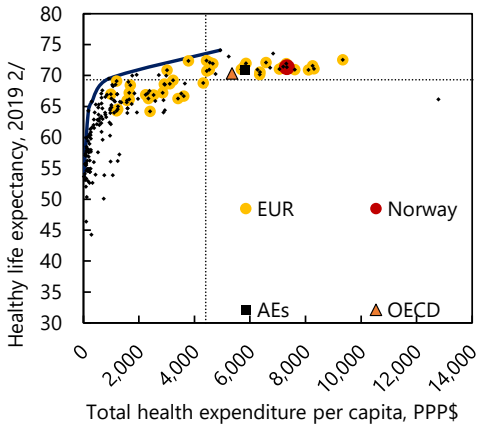
18. Norway's substantial public spending on education and health ensures broad access and coverage, yet available indicators suggest room for improving cost-effectiveness. International benchmarking indicates that despite high expenditure levels, indicators such as student performance and healthy life expectancy remain around the average, underscoring the need for targeted efficiency improvements. Expanding this analysis to a broader range of public services and social outcomes could help pinpoint areas where spending efficiency can be enhanced, ensuring better value for money, while mitigating long-term fiscal pressures (See Chapter 2 "Raising the Effectiveness of Public Spending", OECD, 2024).

Government Education Spending and Outcome, Secondary, Latest Value Available 1/



1/ Dashlines are the average of EUR.
Source: IMF FAD Expenditure Assessment Tool (EAT), World Bank.

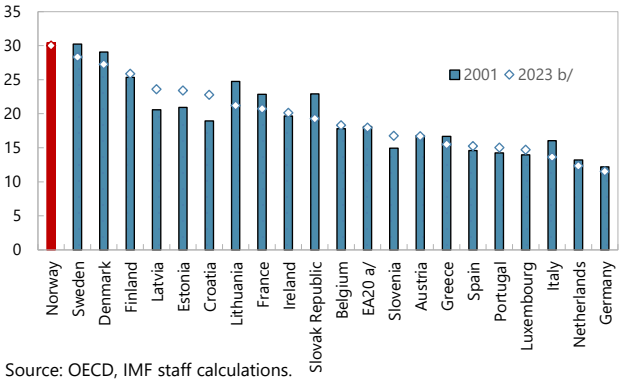
Health Efficiency Frontier, Latest Value Available 1/ 2/



1/ Dashlines are the average of EUR.
Source: IMF FAD Expenditure Assessment Tool (EAT), World Health Organisation.
2/ Healthy life expectancy (HALE) is a measure of health expectancy that applies disability weights to health states to compute the equivalent number of years of life expected to be lived in full health.

19. Norway's high level of public employment is a persistent characteristic of its public sector, with potential implications for efficiency. As of 2023, public employment in Norway accounted for approximately 30 percent of total employment, significantly higher than the Euro Area average (excluding Cyprus and Malta) of around 18 percent. This high level of public employment is consistent with Norway's welfare state and its emphasis on delivering public services such as healthcare, education, and social protection. While Norway's public workforce is extensive compared to many advanced economies, evidence suggests that service outcomes do not always align with this high staffing level. In particular, healthcare and education appear to yield only average or modestly improving results, prompting questions about whether substantial resources are translating into commensurate service benefits. Potential reforms to tackle these shortcomings include enhanced performance-based budgeting, further digital transformation, and improved workforce management, all aimed at streamlining processes, reducing costs, and raising productivity (OECD, 2024; IMF, 2022).

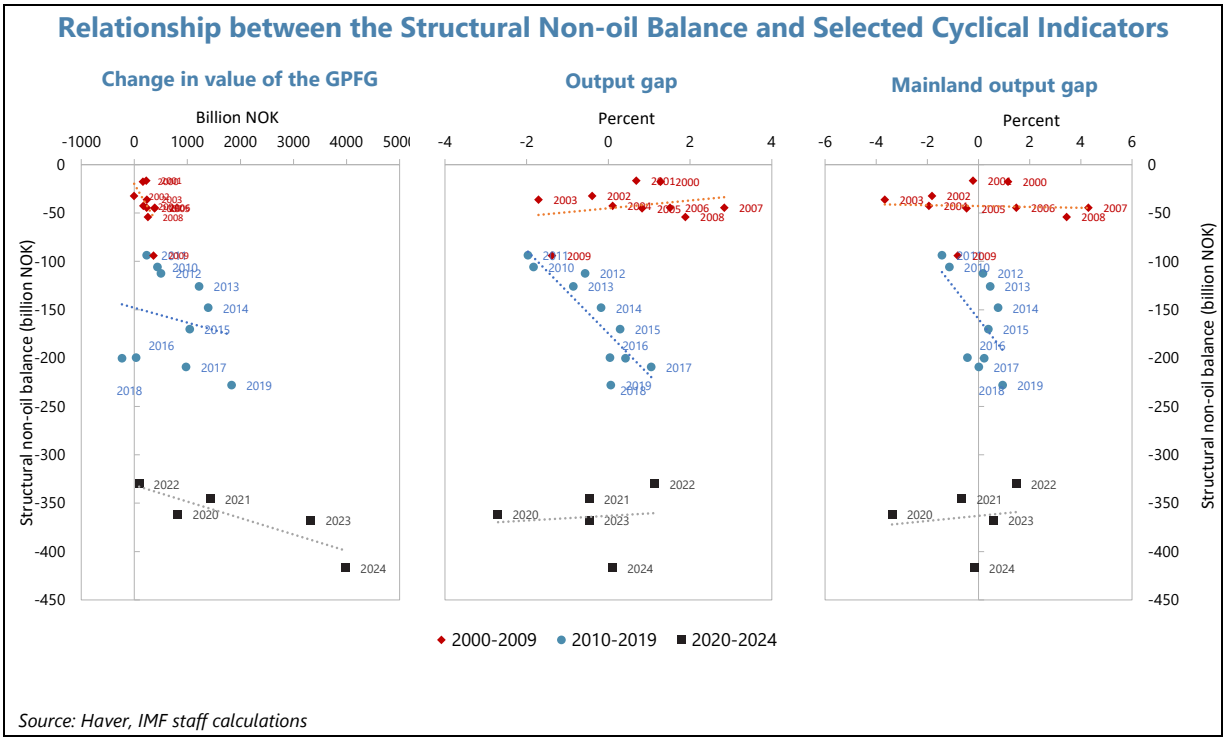
Share of Employment in the General Government
(In percent)



Source: OECD, IMF staff calculations.
a/ Excludes Cyprus and Malta.
b/ Data corresponds to 2022 for Portugal, Norway and EA20.

Fiscal Cyclicality in Norway

20. Norway's fiscal stance is shaped not only by economic cycles but also by changes in the GPFG and oil sector activity. Unlike most advanced economies—where policy mainly responds to GDP fluctuations—Norway's framework also factors in the GPFG's performance and net cash inflows from oil-based industries when setting structural non-oil balances. Because withdrawals from the GPFG finance a large share of the non-oil deficit, swings in the fund's value can translate directly into changes in government spending. This evolution underscores the need to consider both conventional economic cycles and GPFG volatility in preserving the countercyclical orientation of Norway's fiscal framework (Bjørnland and Thorsrud, 2019; IMF, 2022).



Source: Haver, IMF staff calculations

21. Empirical analysis suggests that Norway's fiscal policy exhibits countercyclical behavior in response to GDP cycles but procyclicality in response to GPFG fluctuations. The econometric results on Table 5 show that a 1 percentage point increase in the output gap (measured as a percentage of mainland GDP) is associated with a 0.45 percentage point increase in the structural non-oil balance, indicating a countercyclical fiscal response to economic cycles. However, the response to changes in the GPFG's value suggests the opposite dynamic. Large increases in the GPFG's value have led to higher fiscal transfers and a widening of the structural non-oil deficit, while significant declines have resulted in fiscal tightening. This reflects the design of the fiscal rule, which links structural transfers to the GPFG's market value—a variable heavily influenced by global financial markets. The divergence between global asset price cycles and Norway's domestic business cycle introduces unintended exposure of fiscal policy to global market developments. This procyclical response to GPFG cycles highlights a vulnerability in Norway's fiscal framework, as it amplifies the impact of financial market volatility on public finances. For instance, during periods of strong GPFG

performance, fiscal policy has tended to expand, contributing to overheating risks. Conversely, sharp and prolonged declines in the GPFG's value could force abrupt fiscal adjustments, exacerbating economic downturns and undermining fiscal stability (Cabezon and Henn, 2018; IMF, 2022). As the GPFG's value has increased significantly, the magnitude of the impact has become more pronounced.

Table 5. Norway: Fiscal Cyclicality in Norway

VARIABLES	(1) Diff Struct. Non-oil Balance	(2) Diff Struct. Non-oil Balance	(3) Non-oil Revenues/ Mainland GDP	(4) Non-oil Revenues/ Mainland GDP	(5) Non-oil Expenditure /mainland GDP	(6) Non-oil Expenditure /mainland GDP
Output gap (overall economy)	0.450**		-0.029		-0.859***	
	(0.194)		(0.174)		(0.293)	
Output gap (mainland GDP)		0.278		0.046		-0.691**
		(0.191)		(0.153)		(0.273)
Cycle in GPFG (pct. of GDP)	-0.024***		0.000		0.023	
	(0.007)		(0.008)		(0.018)	
Cycle in GPFG (pct. of Mainland GDP)		-0.020***		-0.001		0.022*
		(0.007)		(0.010)		(0.012)
Fuel Index	0.003	0.003	-0.000	-0.001	-0.002	0.004
	(0.003)	(0.003)	(0.005)	(0.005)	(0.008)	(0.006)
Lagged, Diff(Structural Non-Oil Balance, % Mainland GDP)	-0.452***	-0.425***				
	(0.093)	(0.114)				
Lagged Non-oil Revenues/Mainland GDP			0.573***	0.589***		
			(0.165)	(0.169)		
Lagged Non-oil Expenditures/Mainland GDP					0.625***	0.535***
					(0.109)	(0.107)
Observations	23	23	24	24	24	24
R-squared	0.663	0.428	0.393	0.396	0.722	0.648

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The table reflects the results from a country-specific regression for Norway's data. The econometric specification follows closely the standard fiscal policy reaction function (Golinelli and Miligliano, 2009). The dependent variables include the change in the structural non-oil balance (columns 1–2), and revenue and expenditure ratios to GDP (columns 3–6). Explanatory variables include measures of the output gap (based on both overall and mainland GDP), the cycle in the Government Pension Fund Global (GPFG), and the international fuel price index. The output gap is computed using a production function approach, while the GPFG cycle is derived from an HP filter applied to the fund's value relative to GDP. Lagged values of the dependent variable are included to account for fiscal inertia, capturing gradual adjustments in policy and the persistence of spending or revenue decisions over time. The inclusion of the international fuel price index reflects Norway's high dependence on petroleum-related revenues and the impact of global commodity prices not captured by the GPFG or business cycles.

22. Expenditure plays a stabilizing role over the business cycle. As shown in columns (3) and (4) of Table 5, revenues do not exhibit a consistent countercyclical or procyclical pattern. By contrast, expenditure, examined in columns (5) and (6), responds countercyclically to the output gap, consistent with the operation of automatic stabilizers. At the same time, the positive and significant coefficient on the GPFG cycle (0.022) implies that expenditure increases during periods of high fund returns, which may reflect procyclical pressures tied to perceptions of increased fiscal space. Taken together, these results suggest that while expenditures are responsive to the business cycle in a countercyclical direction, they may still be influenced by asset-market-driven fluctuations in the GPFG. This duality underscores the importance of further insulating expenditure policies from oil and financial markets volatility, while preserving their stabilizing function.

23. The dual nature of Norway's fiscal cyclicality—countercyclical to GDP but procyclical to GPFG—poses challenges for fiscal stability and underscores the need for reforms.
While the countercyclical response to GDP cycles helps stabilize the mainland economy, the procyclical response to GPFG fluctuations undermines this stabilizing effect. The fiscal framework

effectively shields the budget from short-term oil price volatility and allows automatic stabilizers to operate with respect to domestic GDP fluctuations. However, it remains exposed to shocks originating in global financial markets due to the close link between GPFG transfers and its market value. This dual dynamic is particularly concerning as the GPFG's large and increasing value is subject to significant volatility, driven by global financial market conditions. Mitigating the impact of the GPFG-driven volatility on government spending by introducing expenditure rules or smoothing mechanisms for GPFG transfers should be considered (IMF, 2022; OECD, 2022).

D. Complementing Norway's Fiscal Rule with an Operational Expenditure Rule: Impact on Public Finances

24. Norway's spending trends underscore the need to enhance the existing fiscal framework by explicitly incorporating expenditure efficiency and countercyclicality. Despite the GPFG's substantial buffer, structural non-oil deficits have widened over time, largely driven by increasing reliance on GPFG transfers. With petroleum revenues expected to decline and demographic pressures mounting, these trends highlight vulnerabilities in Norway's fiscal setup. Empirical analyses indicate that Norway's expenditures in percent of mainland GDP remain particularly elevated compared to peer countries (Table 3 and Table 4), exacerbating fiscal risks from economic shocks and volatility in commodity and stock markets. Moreover, current mechanisms have not fully insulated fiscal policy from commodity and financial markets fluctuations, demonstrating some degree of procyclicality. Accordingly, a complementary operational anchor—focusing on expenditure-to-GDP or deficit-to-GDP metrics—could strengthen medium-term guidance while remaining consistent with the long-run 3-percent withdrawal principle.

25. Against this background, two benchmark fiscal scenarios are evaluated to assess how operational enhancements could complement the current rule. To facilitate comparison, the simulations focus on two stylized and clearly delineated options[8]:

- **Preservation Rule.** Full adherence to the existing 3-percent real return guideline: structural non-oil deficits is equal, in every year, to three percent of the lagged value of the GPFG. This benchmark mirrors broadly past fiscal outcomes, with annual withdrawals aligned with the rule's real return guideline around the 3-percent level.

- **Deficit-to-GDP Anchor (DGA) Rule.** This alternative adopts an expenditure-based approach that translates a predetermined path for the non-oil deficit—expressed as a percent of mainland GDP—into annual ceilings for GPFG withdrawals. For simplicity we assume that revenues as percent of mainland GDP are constant. This transforms the fiscal balance target into annual expenditure ceilings, thereby limiting procyclical swings tied to the GPFG's valuation. The expenditure and deficit trajectories would be designed to be consistent with the long-run

[8] The two simulation options are a simplified version of the "preservation rule" and the "business cycle rule" (named DGA rule in this document) proposed by Norges Bank Investment Management (NBIM, 2023) and are applied in a partial equilibrium framework to examine their implications for fiscal resilience. Technical details of the benchmark scenarios are provided in the Annex.

3-percent-of-GPFG guideline, ensuring intertemporal sustainability, while smoothing spending dynamics. Such an anchor could discourage persistently rising deficits during favorable periods, enhancing credibility and control over medium-term expenditure trends.

Long-term projections for both scenarios assume convergence to expected macroeconomic paths: mainland GDP growth of 1.5 percent, real returns on the GPFG of 3 percent, and inflation near the 2 percent target.

26. In the proposed framework, the preservation rule is defined by full adherence to the current fiscal rule. Specifically, non-oil deficits are capped at 3 percent of the GPFG's value—its estimated long-run real return. This scenario preserves the credibility of the existing rule without introducing any expenditure-specific targets. While the fiscal rule allows flexibility to stay below the 3 percent threshold, maximum annual withdrawals are assumed for benchmarking purposes to assess the limits of fiscal prudence. Under this assumption, fiscal spending passively tracks the performance of the GPFG. This approach supports ensuring intergenerational equity and wealth preservation but provides limited responsiveness to changing domestic economic conditions and lacks a mechanism to ensure expenditure efficiency.

27. In contrast, the DGA rule introduces an operational, expenditure-based framework designed to limit exposures to GPFG volatility. While still anchored and calibrated to the long-term real return benchmark, this rule provides a structured mechanism to temporarily deviate from the 3 percent guideline, based on short- and medium-term expenditure targets expressed as deficits in percent of mainland GDP.[9] These targets can be calibrated so that, over the medium term, the implied structural deficit is broadly compatible with the 3-percent-of-GPFG benchmark—thereby avoiding the need for frequent or discretionary changes to the real return rate guideline. This mechanism could be periodically recalibrated to remain aligned with the GPFG's long-term expected real return. By decoupling the non-oil fiscal deficit from short-term fluctuations in the GPFG's value, the rule enhances countercyclicality, embeds expenditure efficiency considerations, and reduces fiscal vulnerability to market volatility. The implementation of this active spending framework would require strong institutional safeguards—such as credible medium-term expenditure ceilings—to ensure alignment with sustainability objectives and to curb spending pressures during GPFG expansions.

28. The simulations highlight the trade-offs between the two schemes. The preservation rule promotes long-run fiscal soundness and intergenerational equity but may amplify short-term spending fluctuations driven by volatility in GPFG performance. By contrast, the DGA rule improves

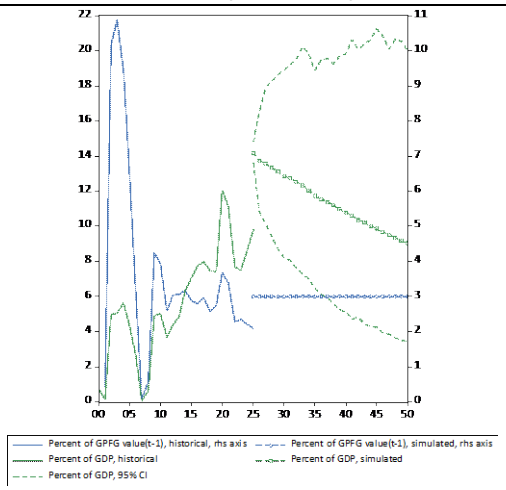
[9] To avoid mechanical pro-cyclicality, the expenditure ceiling could be set with reference to trend (potential) mainland GDP—rather than contemporaneous GDP—so that the nominal limit does not fall automatically in downturns. Additional design choices (e.g., targeting net primary expenditure that excludes interest payments, and specifying escape clauses for deep recessions) could be considered as well.

fiscal responsiveness and expenditure quality but introduces implementation challenges and the need for stronger fiscal institutions.[10]

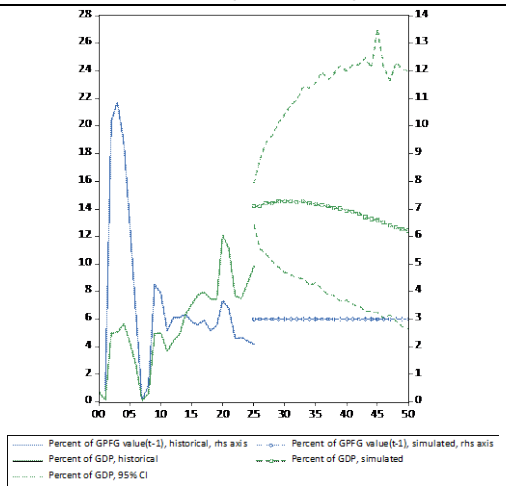
Preservation Rule

Simulations of GPFG Withdrawals (In Percent of Mainland GDP and Lagged GPFG Value)

Excludes future oil inflows

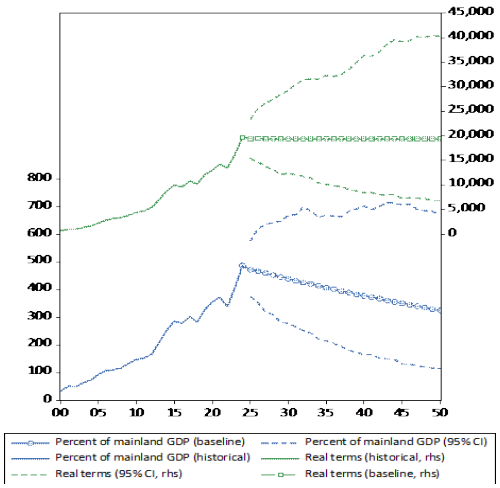


Includes future oil inflows

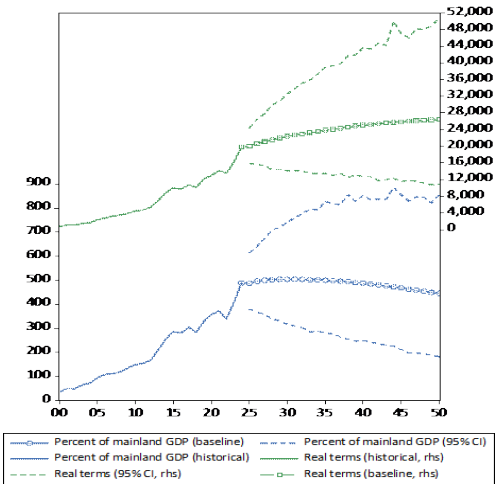


Simulations of GPFG Value (In Percent of Mainland GDP and in Real Terms)

Excludes future oil inflows



Includes future oil inflows



29. Both the DGA rule and the preservation rule are effective in preserving the real value of the GPFG under risk-free scenarios. In both frameworks, the future trajectory of the GPFG

[10] Implementation challenges include the need for clear expenditure calibration, effective enforcement, and transparent adjustment mechanisms. Stronger fiscal institutions—such as independent fiscal councils—help monitor compliance and maintain credibility. While Norway lacks a formal fiscal council, it benefits from the Advisory Committee for Fiscal Policy Analysis, an independent and respected body that regularly evaluates fiscal policy and adherence to the fiscal rule. Expanding its area of responsibilities would help enhance fiscal governance.

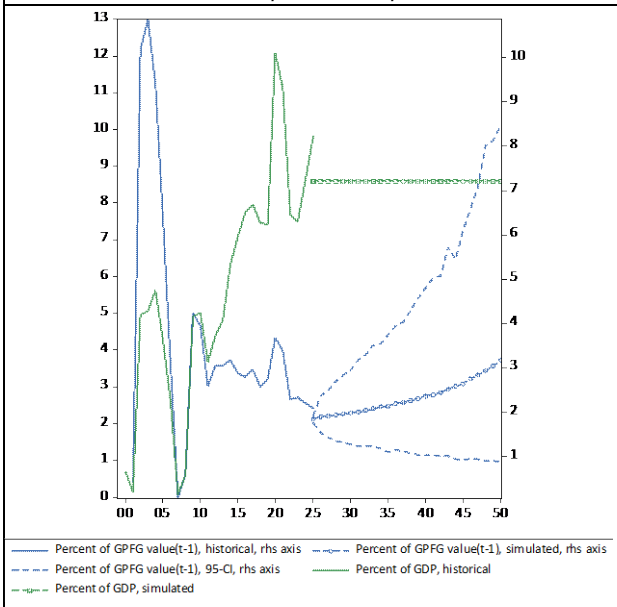
depends heavily on projected oil inflows, which have a strong and positive impact on fund performance. By design, the preservation rule maintains, at least, a constant real GPFG value over the long term. Anchoring the non-oil deficit to a constant share of GDP under the DGA rule enhances the likelihood of preserving the fund's value, as suggested by simulations that hold the deficit constant at its 2024 level (see Panel A and Panel B). However, if deficits were to increase persistently, the results could reverse, reducing the probability of long-term preservation (see Panel C and sensitivity analysis in the Annex).

30. The volatility of the GPFG's real returns is the main driver of uncertainty in the simulation results. The wide confidence intervals for both GPFG valuations and withdrawals stem largely from the volatility of the fund's real return. Thus, fiscal planning that incorporates this uncertainty should aim at more ambitious fiscal targets to hedge against the risks posed by large fluctuations in the GPFG's value. Sensitivity results suggest that a fiscal balance of about 5 percent of GDP could help preserve the GPFG's real value within a 95 percent confidence interval. These results are meant solely for illustrative purposes (see additional sensitivity analysis results in the Annex). Importantly, achieving such prudence does not require mechanical adjustments to the 3-percent real return rule; instead, a well-calibrated expenditure (or deficit) anchor can translate into de-facto withdrawal rates that fluctuate within a narrow, credible corridor over the cycle.

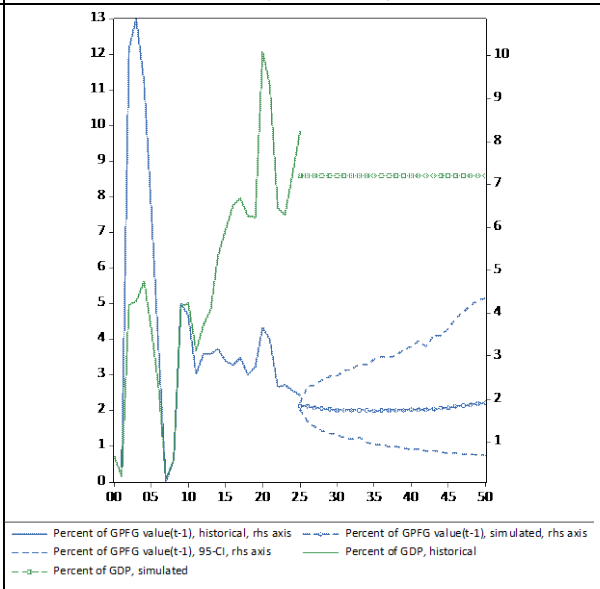
DGA Rule*

Simulations of GPFG Withdrawals (In Percent of Mainland GDP and Lagged GPFG Value)

Excludes future oil inflows

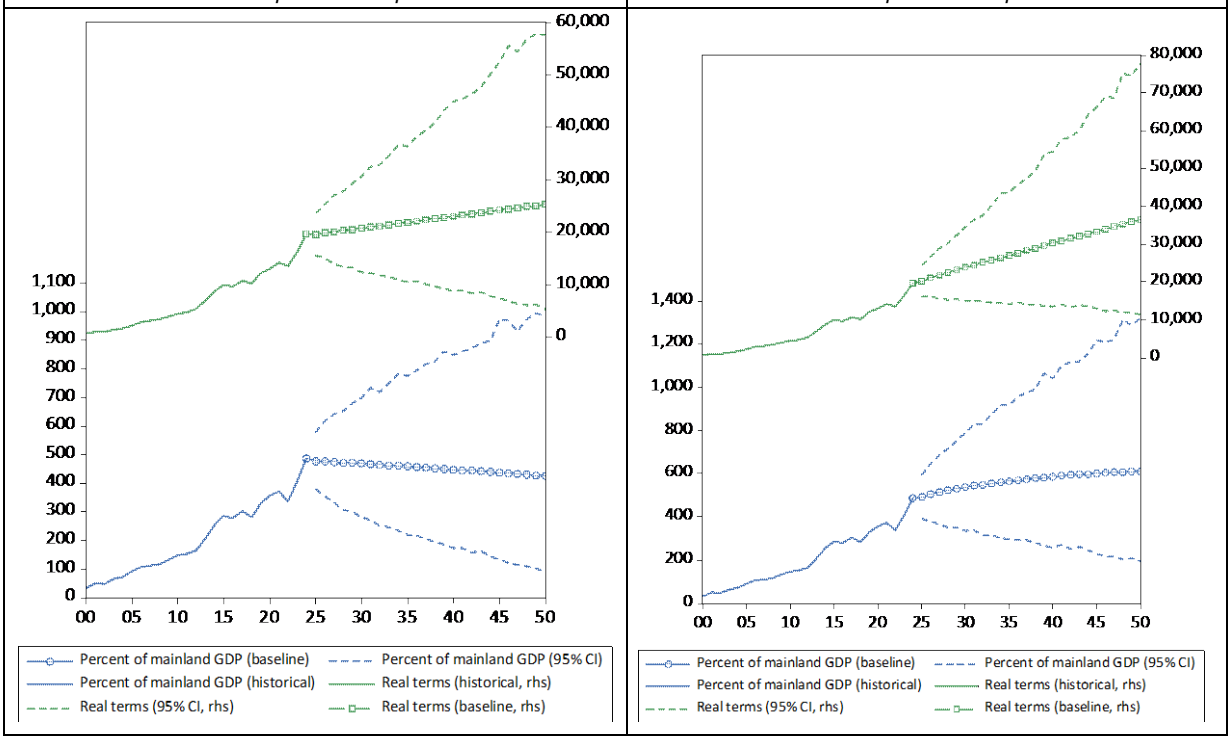


Includes future oil inflows



* An important objective of the exercise is to illustrate that introducing expenditure ceilings can be broadly compatible with the 3 percent guideline embedded in the current fiscal rule over the medium term. Therefore, in this version of the DGA rule simulations, cumulative withdrawals from the GPFG do not match the 3 percent guideline exactly. As a result, the real value of the Fund may persistently rise or fall over time.

Simulations of GPFG Value (In Percent of Mainland GDP and in Real Terms)

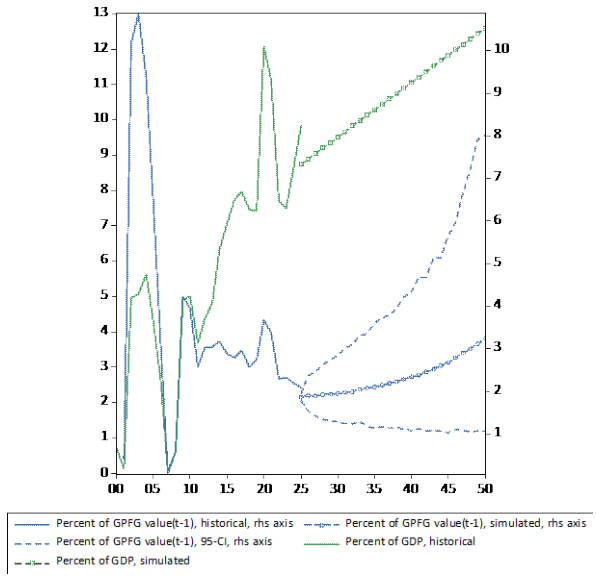


Scenario with Increasing Expenditure Needs

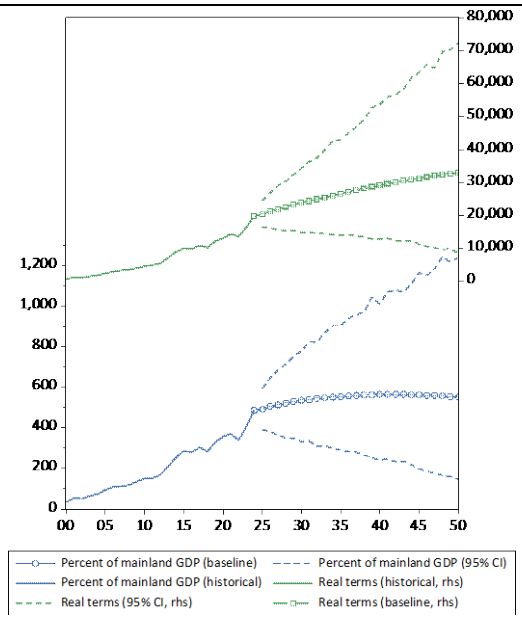
31. The results under the preservation rule do not align with the projected widening of the fiscal gap. The 2024 Long-Term Perspectives of the Norwegian Economy report estimates that the fiscal deficit is projected to widen by approximately 6 percentage points of GDP by 2060 (mainly due to demographic changes), whereas full compliance with the fiscal rule under the preservation rule scenario would require reducing the non-oil fiscal deficit over the long run (see Panel C). These findings underscore that relying solely on the 3-percent benchmark leaves fiscal policy overly exposed. By contrast, an operational deficit anchor—as illustrated in the DGA rule simulations—can guide short- and medium-term spending without formal changes to the headline rule, thereby preserving credibility while enhancing resilience.

Simulations of GPFG Withdrawal and Value – Increasing Expenditure Needs

a) GPFG Withdrawals



b) GPFG Value



E. Remarks and Policy Recommendations

32. The above analysis suggests that, while the current fiscal rule served Norway well, the resilience of its fiscal framework could be strengthened to better respond to evolving fiscal challenges. Two options could be considered: (i) recalibrating the 3-percent rule more frequently to better reflect changing economic conditions; and (ii) complementing the existing framework with a medium-term orientation and an expenditure rule to anchor fiscal policy more firmly to the real economy. These alternatives, along with their implications, are discussed below.

33. Revising the 3-percent rule alone would only partially address concerns around spending efficiency, fiscal procyclicality, and the volatility of GPFG returns. While lowering or modifying the guideline might marginally reduce headline transfers, it would not tackle the core issue—expenditure growth has increasingly tracked financial market fluctuations rather than the underlying performance of the real economy. The 3-percent rule, grounded in the expected real return of the fund, remains a credible and transparent. Adjusting it frequently could undermine the framework's clarity and predictability without delivering lasting improvements to fiscal resilience. Addressing current challenges requires a more fundamental shift that better insulates fiscal policy from asset price cycles and reinforces incentives for efficient public spending.

34. Recent refinements to Norway's fiscal framework reflect a recognition of asymmetric risks to fiscal sustainability. Norway has already taken steps to temper the 3-percent guideline by introducing an "asymmetric buffer" that accounts for downside risks to the GPFG's long-run returns. As outlined in the 2024 National Budget, three asymmetry sources of risks—macro-financial crises, the rigidity of fiscal spending in downturns, and the gradual phasing out of counter-cyclical

measures—justify lowering the structural withdrawal guideline by around 0.3 percentage points. Accordingly, in normal years, fiscal policy targets GPFG withdrawals of 2.7 percent rather than the expected long-run real return of 3 percent. The formalization of this prudential margin to guard against downside risks illustrates the government's willingness to refine the fiscal rule based on empirical evidence. The measures proposed in this paper can be viewed as analogous refinements, aimed at strengthening the framework's resilience and its alignment with long-term fiscal objectives.

35. Strengthening the fiscal framework through an expenditure-based operational anchor can enhance resilience, efficiency, and sustainability. This alternative approach would complement the current rule by translating a pre-set medium-term path for the structural non-oil deficit—expressed as a share of mainland GDP—into annual expenditure ceilings.[11] Such a rule would retain the long-term orientation of the existing framework while offering a more direct lever to guide fiscal policy. Any enhancement to the fiscal framework should preserve flexibility to allow timely fiscal policy responses to shocks. Specifically, the measures proposed below would enhance insulation from asset price volatility, improve fiscal discipline, internalize expenditure efficiency elements, and help preserve space to address demographic and security needs. Furthermore, staff simulations indicate that capping expenditure growth would be necessary to preserve the real value of the GPFG in the long term under a risk scenario. Key proposals include:

- *Introducing an operational expenditure ceiling compatible with the 3 percent rule.* Specific guidelines for periodic recalibration of the ceiling should be carefully discussed among all stakeholders. An option worth considering is the establishment of a ceiling on central government non-oil spending growth, aligned with potential mainland GDP growth. Internalizing GPFG value volatility and incorporating spending efficiency elements into the fiscal framework would enhance predictability, support countercyclical policy, and preserve intergenerational equity.

- *Integrating the expenditure target into a binding medium-term expenditure framework* (MTEF). The central government should incorporate baseline appropriations aligned with performance objectives. New permanent spending initiatives should be accompanied by identified offsetting savings or new revenue sources. Adjustment mechanisms and emergency escape clauses should be defined to address deviations from the ceiling beyond predefined margins.

- *Expanding the mandate of the Advisory Panel on Fiscal Policy Analysis to reinforce transparency and compliance*. Benchmarking the Advisory Panel on Fiscal Policy Analysis against international best practices for independent fiscal councils would further enhance transparency and accountability. Building on its current responsibilities, the responsibility of the Advisory Panel could be expanded to include: i) assessing adherence to the enhanced framework and ii) publishing periodic reports on the trajectory of Norway's general government net worth—including the GPFG, remaining petroleum assets, and gross liabilities.

[11] The government currently prepares internal three-year projections but does not publish multi-year budgets.

- *Introducing complementary expenditure review cycles to help improve value for money and create space for priority needs*. Conditional, time-bound GPFG withdrawals to finance major investment projects could be allowed, if subject to rigorous, independent cost-benefit analysis, in line with best practices among resource-rich economies. This would reduce lower-efficiency spending and allow savings to be redirected toward priority areas.

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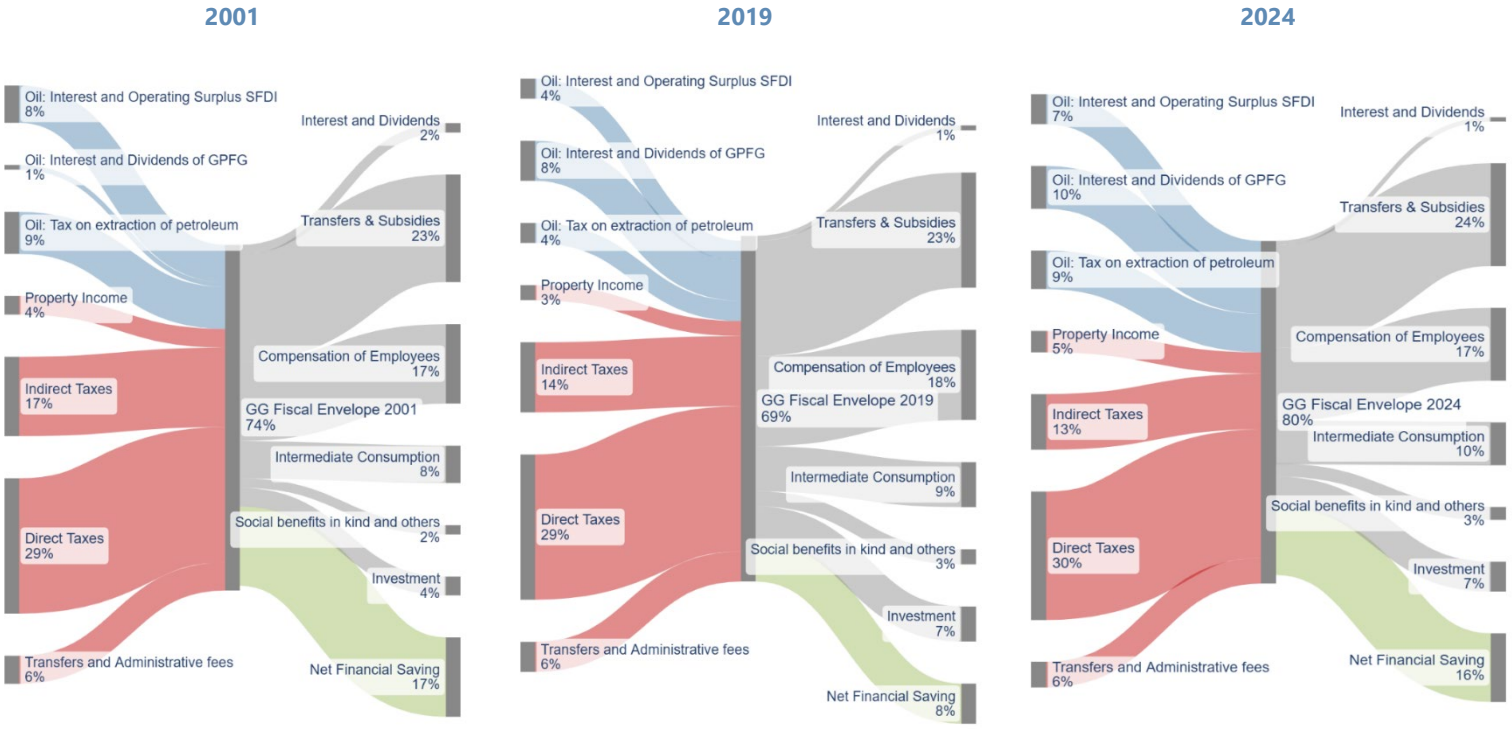
Annex I. Data, Methodology, and Sensitivity Analysis of Simulation Models

Annex I. Table 1. Norway: General Government Fiscal Envelope

(In percent of Mainland GDP)



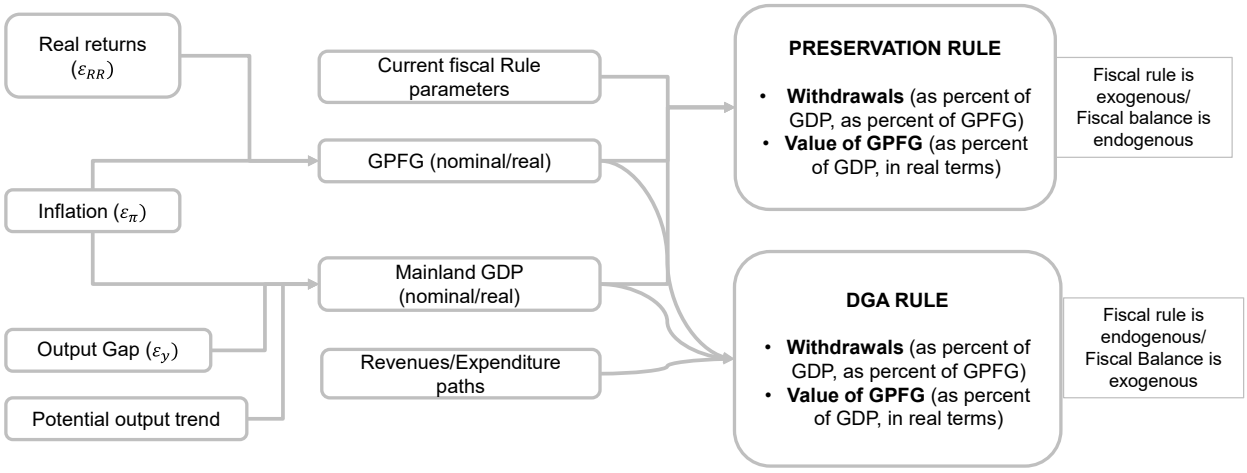
Simulation Models

This appendix outlines the methodology used to simulate the fiscal paths for Norway under alternative fiscal rules. The simulations follow a stochastic macroeconomic framework which is a simplified version of NBIM (2023), focusing on the evolution of the Government Pension Fund Global (GPFG), its real and nominal value, and associated withdrawals.

Fiscal Rule Scenarios

We analyze two benchmark fiscal rules:

- Preservation Rule: The government finances the structural non-oil budget deficit each year up to the amount permitted by the fiscal rule (3 percent of the GPFG's value).
- DGA Rule: GPFG withdrawals cover a fixed share of mainland GDP, based on a pre-determined path of the non-oil deficit.[1]



Macroeconomic Framework

The following diagram provides an overview of the macroeconomic structure. It maps the relationships among the fiscal rule assumptions, real and nominal variables, and fiscal aggregates:

A simplified stochastic macroeconomic framework can be derived by assuming dynamic functions for the evolution of GPFG real returns, inflation, and mainland GDP (including its trend and cyclical variations captured by the output gap).

[1] The size of the deficit must be calibrated to be aligned with the intergenerational equity, wealth preservation and expenditure efficiency objectives.

Based on the historical behavior of real returns, inflation, and output gap, we estimate regressions that ensure that they will converge to their expected long-run steady state, and we save the stochastic component (error term).

The following autoregressive processes are estimated using historical data, ensuring mean reversion to long-run values:

$$RGDP_t^{Gap} = \beta^{RGDP\_Gap} \cdot \left(RGDP_{t-1}^{Gap}\right) + \varepsilon_t^{RGDP\_Gap} \quad (1)$$

$$\pi_t = (1 - \delta^{\pi}) \cdot \bar{\pi} + \delta^{\pi} \cdot \pi_{t-1} + \varepsilon_t^{\pi} \quad (2)$$

$$RR_t^{GPFG} - \overline{RR} = \varepsilon_t^{RR} \quad (3)$$

GDP Projections

Where $RGDP_t^{Gap}$ is the output gap; π_t is the inflation rate and RR_t^{GPFG} corresponds to the real return of the GPFG, all at year t. We assume $\bar{\pi} = 2\ percent$ and $\overline{RR} = 3\ percent$. For simplicity, β and δ are coefficients estimated by OLS regressions and ε are the error terms.

Based on (1) and (2), and assuming a long-term growth rate for real mainland GDP ($\gamma^{RGDP\_trend} = 1.5\ percent$), it is possible to build a projected path for real ($RGDP_t$) and nominal ($NGDP_t$) GDP, accounting for the uncertainty surrounding the output gap and inflation:

$$RGDP_t^{trend} = RGDP_{t-1}^{trend} \cdot \left(1 + \gamma^{RGDP\_trend}\right)$$

$$RGDP_t = RGDP_t^{trend} \cdot \left(1 + RGDP_t^{Gap}\right)$$

$$NGDP_t = RGDP_t \cdot \left(\frac{CPI_t^{2024=100}}{100}\right)$$

GPFG Value Dynamics

Similarly, the GPFG evolves according to the following identity:

$$GPFG_t^{value} = GPFG_{t-1}^{value} \cdot \left(1 + RR_t^{GPFG} + \pi_t\right) + net\_cash\_flow\_oil - GPFG_t^{withdrawal}$$

Where $net\_cash\_flow\_oil$ is an exogenous time series reflecting the government's latest expectations of oil-related inflows into the GPFG.

Budget Balance Components

Withdrawals from the GPFG are determined according to the fiscal rule scenario being considered: either as a function of the fund's value (preservation rule) or as a share of mainland GDP (DGA rule).

$$GPFG_t^{withdrawal} = \overline{RR} \cdot GPFG_{t-1}^{value};\ \text{under the Preservation Rule scenario}$$

$$GPFG_t^{withdrawal} = (\alpha^S - \alpha^R) \cdot NGDP_t \ ; \text{ under the DGA Rule scenario}$$

$$GPFG_t^{withdrawal} = (\alpha_t^S - \alpha_t^R) \cdot NGDP_t \ ; \text{ under the DGA rule with increasing fiscal gap scenario}$$

Under the DGA scenario, for simplicity $\alpha^S and\ \alpha^R$ are constant and remain at the level of the latest historical value. This assumption is relaxed in the "DGA with increasing fiscal gap" scenario, where $\alpha_t^S\ and\ \alpha_t^R$ are allowed to vary over time. Depending on the rule assumed, the fiscal deficit may adjust endogenously to ensure consistency with the rule (preservation case), or be fixed exogenously with implications for required GPFG withdrawals (DGA case).

Simulation Outputs and Calibration

Stochastic simulations generate distributions of key macroeconomic and fiscal variables (GPFG value, withdrawals, non-oil balance, GDP and inflation) over the projection horizon. Our analysis covers a time horizon from 2025 to 2050, selected to assess long-term fiscal resilience under different policy rules.

Long-term model parameters are calibrated based on expected values (e.g. inflation target of 2 percent), while their short-term dynamics and uncertainty are estimated based on Norwegian historical data. Sensitivity tests are conducted for alternative assumptions on key inputs, such as the size on non-oil fiscal deficits. These simulations are used to assess the probability distribution of fiscal outcomes and to quantify risks to fiscal sustainability under current and reformed fiscal frameworks.

Confidence Intervals and Correlated Shocks

Confidence intervals around the baseline projections are generated using stochastic simulations. The error terms $\varepsilon_t^{RGDP\_Gap}$, ε_t^{π} and ε_t^{RR} are assumed to follow a multivariate normal distribution, with a variance-covariance matrix estimated from regression estimates.

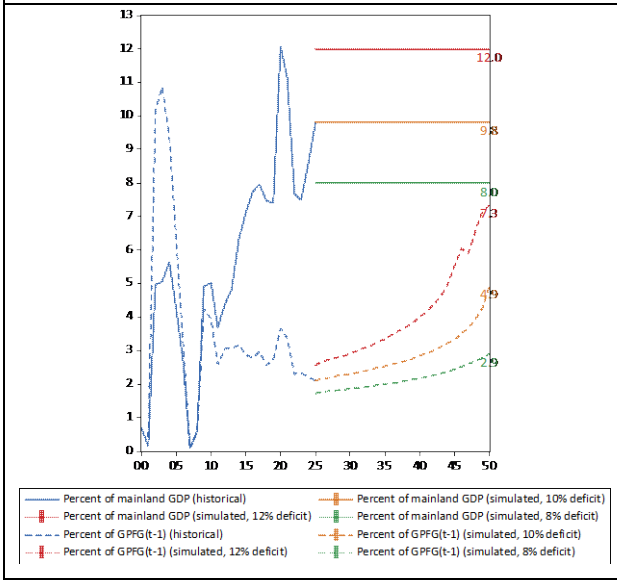
This allows for a realistic correlation structure between shocks to real returns, inflation, and the output gap. As a result, the simulations preserve interdependencies across macroeconomic shocks, allowing us to construct empirical confidence bands (95 percent intervals) for key fiscal aggregates, such as the value of the GPFG, withdrawals, and the structural non-oil deficit.

These confidence intervals provide a probabilistic assessment of fiscal outcomes under each scenario, illustrating the degree of uncertainty and the likelihood of adverse developments under each fiscal scenario.

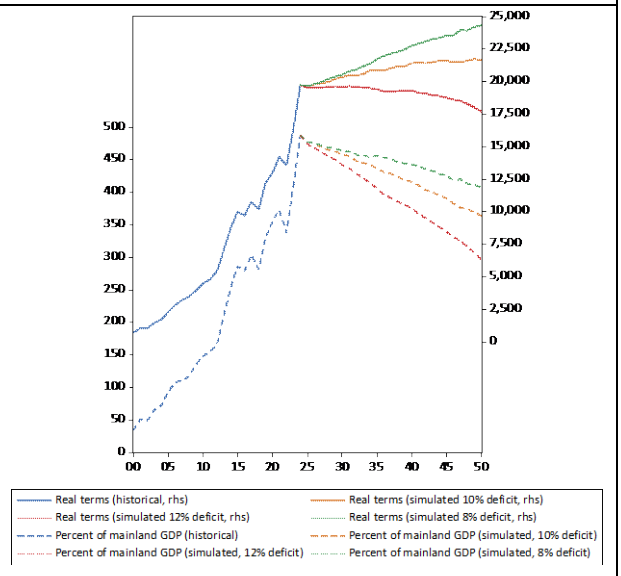
Sensitivity Analysis

Annex I. Figure 1. Norway: DGA Scenario, *excluding* Future Oil Inflows

a) GPFG Withdrawals

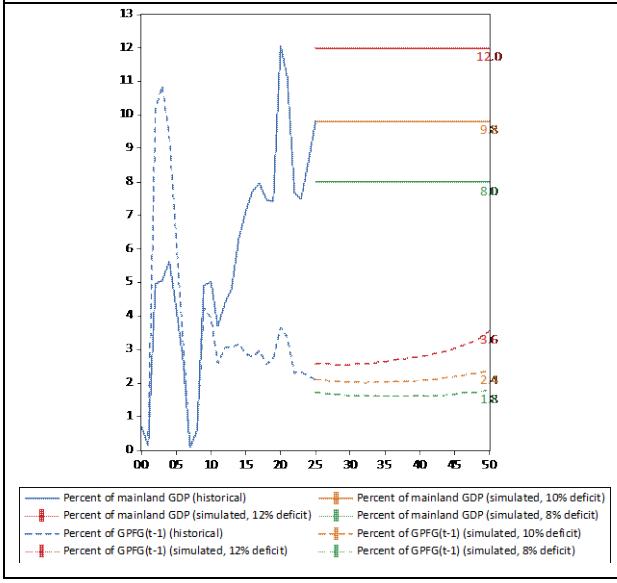


b) GPFG Value



Annex I. Figure 2. Norway: DGA Scenario, *including* Future Oil Inflows

a) GPFG Withdrawals



b) GPFG Value