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National Institute of Economic Research's Fiscal Sustainability Projections – A Method Description

This appendix describes the analytical framework used by the National Institute of Economic Research (NIER) for fiscal sustainability projections. It begins by outlining the overarching purpose of the projections and their relation to the fiscal policy framework. This is followed by a description of various macroeconomic assumptions as well as projections for public expenditure and revenue. Finally, it explains how NIER's definition of fiscal sustainability can be derived from the intertemporal budget constraint.

The Fiscal Policy Framework

The fiscal policy framework is based on four budgetary policy objectives. Some parts of the framework are regulated by law, while others are the result of practices developed since the crisis of the 1990s.

The **net lending target** is defined as the financial savings in the public sector averaging 1/3 percent of GDP over a business cycle. In 2027, this surplus target is proposed to be replaced with a balanced budget target, meaning that savings should instead average 0 percent of GDP over a business cycle.

In addition, there is a **debt anchor** for the Maastricht debt, with a reference value of 35 percent of GDP. If the debt deviates from the anchor by more than 5 percent of GDP, the government must submit a special report to the parliament.

Furthermore, the parliament, upon proposal from the government, must decide on an **expenditure ceiling** for the state and the old-age pension system for the next three years. This decision clarifies the spending limits, which is intended to facilitate achieving the net lending target.

Finally, the **balanced budget requirement** means that municipalities and regions must prepare budgets where expenditures do not exceed revenues. This requirement sets the minimum acceptable result level. Municipalities and regions must also maintain sound financial management in their operations.

Introduction

Long-term fiscal sustainability analyses aim to evaluate whether the public sector's ability to meet its current and future obligations—whether explicit or implicit—is financially viable.[1] Welfare provided to today's population must be funded in a sustainable way to ensure that future generations have the same opportunities for welfare as people do today.

In the Fiscal Sustainability Report, NIER analyses the implications for public finances as the size and composition of the population change over the coming decades. The main question is whether current tax revenues are sufficient to fund future public expenditure as demographics change, given current welfare services and replacement rates in the transfer systems. These projections illustrate the potential consequences of any imbalance between revenue and expenditure if left unaddressed. Large deficits in net lending can contribute to public debt growing in such a way that the public sector may struggle to meet its debt obligations. These calculations can also be used to assess the extent of the adjustments that may need to be made today to avoid imbalances between revenues and expenditures.

In Sweden, the fiscal policy framework acts as a steering mechanism for fiscal policy (see margin box "The Fiscal Policy Framework"). It includes goals and principles aimed at ensuring

[1] See, for example, Burnside (2005), Calmfors (2020), and the European Commission (2024).

long-term fiscal sustainability.[2] The framework thus effectively acts as a constraint on public finances already in the short and medium term. However, in the sustainability projections, public finances are not aligned with the surplus target or debt anchor within the framework. Instead, the purpose is to assess the magnitude of any imbalances caused by demographic changes. Thus, the projections should not be seen as a scenario for future development but rather as a consequence analysis under certain assumptions.

There are various ways to define sustainable public finances. NIER's definition is based on the public sector's financial net position—financial assets minus gross debt. Public finances are considered sustainable if the net position and the Maastricht debt (see margin box "Net Financial Position and Maastricht Debt") do not deteriorate noticeably as a share of GDP over a long time. It is also important that the Maastricht debt does not become too large, as this could lead to higher risk premiums and increasing interest expenditures, while financial assets may be difficult to realize in practice.

Net Financial Position and Maastricht Debt

The **net financial position** is the net of financial assets and the gross debt of the public sector. If the financial assets exceed the gross debt, the public sector has a net financial wealth. If the assets are less than the gross debt, the public sector has a net financial debt.

The **Maastricht debt** refers to the consolidated gross debt of the public sector. It is considered consolidated in the sense that internal debts within the public sector are excluded. Thus, it represents the total debt that the central government, the municipal sector, and the old-age pension system collectively owe to lenders outside the public sector.

Fiscal Assumptions in the Sustainability Projections

This section outlines the fiscal assumptions that underlie the sustainability projections. A fundamental assumption in projecting public expenditures is that the scope of various welfare services is maintained, as are the replacement rates in the transfer systems. This corresponds to several specific assumptions in the projection of government consumption and transfers.

These assumptions are guided by the core question driving the fiscal sustainability projections: can today's tax rules finance the existing welfare system in light of future demographic changes? The assumptions implicitly suggest that no new political decisions are made to adjust expenditures. The projected trajectories of public revenues and expenditures are determined by this question and should not be viewed as forecasts or policy recommendations.

A LONG-TERM MACROECONOMIC SCENARIO

The foundation of the sustainability projections is a long-term macroeconomic scenario. The starting point is NIER's most recent short-term forecast and medium-term scenario. After this point, the economy is assumed to be in cyclical balance. GDP then grows at the rate of potential output, which is determined by the economy's supply side.

[2] As an EU member state, Sweden must also comply with the rules of the Stability and Growth Pact, which among other things regulate the size of public sector deficits.

Statistics Sweden's population projections and data from the Labour Force Survey (AKU) form the basis for forecasting various labor market variables. Employment rates and labor force participation are calculated based on population composition—by sex, age, and country of birth—at an aggregated level. An important assumption is that the average age of labor market exit will increase over time. The assumption is based on the expectation that life expectancy in the population will continue to rise, as will the statutory retirement ages in the pension system. Thus, labor force participation rises, impacting both the number of people in the labor force and in employment.

In the scenario, the value added in the economy (GDP) is determined by hours worked (number of employed people and their average working hours) and a trend assumption for labour productivity growth. Inflation is assumed to be in line with the inflation target (2 percent per year, measured by CPIF), forming the basis for computing various deflators and hourly wages. The policy rate and market interest rates are assumed to converge toward long-term equilibrium levels.

GDP is then distributed on the demand side using various assumptions, including the long-term share of investment in GDP, the import content of different components, and the long-term current account balance as a share of GDP. Government consumption is determined entirely by demographic factors.

Individual and Collective Services

Government consumption can be divided into individual and collective services. Individual services are those that are demanded and consumed by a single individual, while collective services are those that are provided simultaneously to all individuals. Examples of individual services include education, healthcare, elderly care, and personal assistance. Approximately 75 percent of all government consumption is classified as individual, and the majority of these are found within the municipal sector. Examples of collective services include defence, emergency services, the judicial system, maintenance of roads and railways, as well as research and development. About 25 percent of all government consumption is collective, and the majority of this is found within the central government.

ASSUMPTIONS FOR PUBLIC EXPENDITURES

The projection of primary public expenditures is based on assumptions regarding government consumption, investment, and transfers.[3] These assumptions are grounded in today's replacement rates in transfer systems and the scope of welfare services.

Government Consumption

For welfare services aimed at individuals (i.e., individual consumption, see margin box "Individual and Collective Services"), it is assumed that the level of service per user remains unchanged. This includes, for example, preschools, schools, and elderly care. In the projections, the number of employees increases in line with the demographically driven demand for each welfare service, meaning that staffing levels remains constant. Thus, employment levels within each service area depend on the population size of the age groups that use the service and how much each cohort currently utilizes it. Additionally, the need for care services among those aged 70 and older is assumed to decrease at the same rate as life expectancy increases.

[3] Public sector revenues and expenditures can be divided into primary revenues and expenditures, which stem from core operations, and capital income and expenditures, which derive from financial assets and liabilities.

For collective services (i.e., collective consumption) such as defense, judiciary, emergency services, and environmental protection, it is assumed that the population as a whole will continue to have the same level of access. For many such services, it is reasonable to assume that if the population doubles, the number of employees must also double to maintain service levels. Hence, employment in collective services increases in step with overall population growth (see the margin box "Calculating Government Consumption Costs at Constant Staffing Levels" for a description of how the costs of government consumption are calculated).

Social Transfers to Households

Transfer payments are assumed to grow in line with the population across different age groups, based on how those groups currently use the systems. In addition, expenditure is projected using the development of the average hourly wage in the economy. This implies that replacement rates (i.e., benefit per user relative to wages) remain constant over time. As a result, transfers as a share of GDP will mainly vary due to demographic changes—i.e., how the number of eligible individuals changes relative to the number of employed persons.

However, income pensions do not follow this principle, as they are determined within the pension system. Their development may differ from the assumption of constant replacement rates depending on the balance between assets and liabilities in the system (see "Sector-Specific Assumptions" below).

Public Investments

Investments are assumed to increase to the extent required to support the projected production of public services. Municipal investments are modeled to grow in line with municipal consumption in current prices. The investment share thus depends on demographic developments. Central government investments—mainly in infrastructure and defense—are assumed to grow with nominal GDP, and thus also indirectly depend on population growth.

Transfers to Businesses and Abroad

Transfers to businesses are assumed to retain current subsidy rates and therefore grow in line with nominal GDP. The same assumption applies to transfers abroad (e.g., EU contributions, NATO fees, and foreign aid), which are largely determined by GDP or GNI levels.

Calculating Costs for Government Consumption at Constant Staffing Levels

In the fiscal sustainability projections, NIER assumes that the staffing levels in welfare services remain constant over time. In addition, it is assumed that expenditures on wages, intermediate goods, and capital depreciation constitute fixed cost shares in the production of each welfare service—an assumption consistent with historical patterns. This setup allows the standard of goods and services consumed to improve over time. Such quality improvements result from wages generally rising faster than prices of intermediate goods. Therefore, the quality and/or volume of consumables increases over time when cost shares are held constant.

A portion of public welfare services is produced by private providers, such as independent schools or privately operated elderly care facilities. The share of services procured from private providers is assumed to remain constant relative to the cost of public sector production, as is the share of public services financed through fees.

In the projection of public welfare services, labor productivity growth is close to zero. This means that the value added from public services (gross output minus consumption) in constant prices nearly follows the development of hours worked.

ASSUMPTIONS FOR PUBLIC REVENUES

Primary public revenues are assumed to develop in line with current tax legislation, as per the latest decisions made by the parliament, municipalities, and regions.[4] This means that tax revenues evolve in step with their respective tax bases. Since different tax bases are taxed at different rates, the composition of the tax base affects the overall development of tax and fee income. For example, demographic developments influence the evolution of household consumption. As a result, taxes and fees may vary somewhat as a share of GDP over time in the projections.

SECTOR-SPECIFIC ASSUMPTIONS

In the projections, imbalances within the public sector are reflected in the central government's net lending and, in turn, in its net position and debt. The public pension system is self-financing and designed to counteract large deficits through an automatic "brake" mechanism.[5] In municipalities and regions,

[4] For the municipal sector, it is assumed that the average municipal tax rate remains unchanged. Given this assumption, any compositional effects on the average tax rate due to internal migration or tax rate adjustments in response to a shrinking tax base are not captured.

[5] See the Swedish Pensions Agency (2025).

income-statement net income—and the sector's total net lending—are governed by the balanced budget requirement and the requirement for sound financial management. In the projections, the net lending of both the pension system and local governments are stabilized. This section describes how the calculations of these sub-sectors are done.

Income Pensions Are Calculated Within the Pension System

The public pension system is a standalone system entirely funded by contributions. In the fiscal sustainability projections, pensions (excluding the guarantee pension and occupational pensions) are projected using the Swedish Pensions Agency's pension model. Income pensions and premium pensions are thus determined within the pension system and do not necessarily follow the assumption of constant replacement rates.[6] If pension liabilities exceed the system's assets, the brake mechanism is activated, and pension payments are indexed to a balance index instead of the income index.

If large surpluses accumulate in the pension system over time, NIER assumes that these are redistributed to retirees through pension increases exceeding the income index—a mechanism equivalent to a "accelerator" in the system.[7] The extent of pension increases is governed by how the system's assets (the buffer funds) grow as a share of GDP. Without such a balancing mechanism, the pension system's net position risks expanding at an accelerating pace. Under current legislation, however, the assets in the pension system may only be used to finance pensions—not other public expenditures.

The Local Government Sector

In the fiscal sustainability projections, municipalities and regions are assumed to comply with the Local Government Act's requirement for sound financial management. Although there is no precise definition of what this entails in terms of income-statement net income or net lending according to the national accounts, it typically implies that municipalities and regions show positive net income over time. Thus, the requirement for sound financial management is stricter than the balanced budget requirement. NIER interprets sound financial management to mean that the net position of the local government sector should remain stable over time as a share of GDP. In the

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[6] See the Swedish Pensions Agency (2024). Note that the premium pension system is classified in the national accounts as part of the private sector and is therefore not considered a transfer from the public sector. The guarantee pension and pension supplements, as well as housing supplements and elderly support allowances, are paid by the state and not by the public income pension system. These are treated in the same manner as other transfers and are assumed to follow wage developments.

[7] This is done for computational purposes in the long-term projection, i.e., beyond NIER's medium-term scenario.

sustainability projections, this is assumed to occur when the sector's net lending is –0.3 percent of GDP, which corresponds to a positive overall net income for the sector.[8]

Municipalities and regions provide and finance most welfare services, including education, healthcare, and elderly care. As noted above, these services in the projections are determined by demographic developments. At the same time, local tax rates are assumed to remain unchanged. Thus, government grants to the local sector are adjusted in the calculations to ensure that the sector's net lending aligns with NIER's definition of sound financial management. This implies that any imbalances in the municipal economy in the fiscal sustainability projections will appear in the net lending of the central government and, in turn, in the overall public sector.

ASSUMPTIONS ON ASSETS AND LIABILITIES

In the projections, each sector's net lending influences the development of financial assets, liabilities, and thereby the net position. Assets and liabilities then generate capital income and expenses, which affect the net lending in the following period.

In addition to savings, the financial net position of each sector is also affected by assumed changes in the value of assets and liabilities.[9] For the central government, it is assumed that there are no new acquisitions, divestments, or equity issuance in the state-owned company portfolio. Therefore, the value of the central government's non-interest-bearing assets only changes due to the assumed valuation change and declines as a share of GDP, while interest-bearing assets are assumed to grow in line with GDP. For the local government sector, financial assets are assumed to grow with government consumption, and valuation changes are assumed to be zero. In these sectors, surpluses or deficits affect only debt. In contrast, assets in the pension system are influenced by both valuation changes and the net lending.

The Budget Constraint for the Public Sector

The intertemporal budget constraint states that the present value of the public sector's future revenues, together with its initial financial net position, must be equal to or greater than the present value of all future expenditures. The constraint can be expressed as

$$nd_0 \leq \sum_{t=1}^{\infty} \frac{pb_t}{(1+r)^t}$$

where nd_0 is the financial net debt as a share of GDP at the starting point, pb_t is the primary net lending as a share of GDP in year t and r is the growth-adjusted interest rate (approximately equal to the interest rate minus GDP growth, see below), which is assumed to be constant over time.

The implication of the intertemporal budget constraint is that the public sector's expenditures must be financed in some way. If expenditures are not fully financed during a given period, this results in a deficit in the net lending, which in turn weakens the public sector's net position. As a share of GDP, the change in net debt, Δnd_t, can be written as:

$$\Delta nd_t = rnd_{t-1} - pb_t.$$

Disregarding valuation effects, the change in net debt depends on three factors:

- The size of the initial net debt as a share of GDP, nd_{t-1}.
- The so-called growth-adjusted interest rate or interest-growth differential, r, which is given by the difference between the nominal implicit interest rate on the financial net debt, i and the nominal GDP growth rate, γ. This can be expressed as: $r = (i-\gamma)/(1+\gamma)$.
- The primary net lending as a share of GDP, pb_t, i.e. the public sector's net lending excluding capital income and capital expenditures.

A Definition of Long-Term Sustainability

To assess fiscal sustainability, NIER evaluates how the financial net position and the Maastricht debt evolve in the projections, given their initial levels. Since the projections are not adjusted to meet the surplus target, the net lending may show surpluses or deficits depending on emerging imbalances.

[8] For a discussion of the balanced budget requirement and sound financial management, as well as NIER's interpretation of these concepts, see The National Economic Research Institute (2019).

[9] The assumptions regarding valuation changes in the central and local government sectors are roughly in line with historical averages since the 2008 financial crisis.

THE INTERTEMPORAL BUDGET CONSTRAINT

The theoretical basis for most sustainability analyses is the intertemporal budget constraint (see margin box "The Budget Constraint for the Public Sector").[10]

This condition implies that the present value of future revenues, together with the initial financial net position, must equal or exceed the present value of future expenditures. In other words, public sector spending must ultimately be financed (see margin box "Conditions for Stabilizing the Net Position of the Public Sector").[11]

The budget constraint permits large and repeated deficits over long periods, provided that sufficiently large surpluses are expected to arise later. It does not set a specific limit on how large the public debt can be, but the larger the debt and associated interest payments, the smaller the fiscal space for public services, transfers, and investments. A significant deterioration in the net position due to rising debt implies that future revenues must increasingly go toward covering interest payments—potentially undermining solvency.

CRITERIA FOR LONG-TERM SUSTAINABILITY

NIER evaluates fiscal sustainability based on the level and trajectory of the financial net position and the Maastricht debt, both as shares of GDP. These metrics are calculated by projecting revenues and expenditures based on demographic trends, assuming today's tax rules and welfare levels.

The Financial Net Position Indicates Sustainability

The financial net position is the most appropriate basis for assessing long-term sustainability, as it captures the full balance sheet of the public sector—unlike the Maastricht debt. The net position is influenced by financial surpluses or deficits over time, as well as valuation changes unrelated to savings. Asset values fluctuate with economic developments, while debt values vary with interest rates and exchange rates.

A trend of deteriorating net position is not considered sustainable, as it jeopardizes payment capacity. Conversely, a strengthening net position may be considered sustainable, though it entails a redistribution from current to future generations.

A Trend of Rising Debt Is Not Sustainable

In practice, a growing Maastricht debt can indicate unsustainable development, even if the net position remains stable. In Sweden,

Conditions for Stabilizing the Net Position of the Public Sector

The debt dynamics of the public sector can be expressed in terms of the change in net wealth, Δna_t,

$$\Delta na_t = r_t na_{t-1} + pb_t + v_t$$

where all variables except r_t are expressed as a share of GDP. Unlike the previous section, this equation includes a residual term, v_t, and allows the interest-growth differential to vary over time. If the differential is written as $r_t = (i_t - \gamma_t)/(1 + \gamma_t)$ the equation becomes:

$$\Delta na_t = \left[\frac{i_t}{1+\gamma_t} na_{t-1} - \frac{\gamma_t}{1+\gamma_t} na_{t-1}\right] + pb_t + v_t$$

Here, $i_t na_{t-1}$ represents the net capital income of the public sector, and $\gamma_t na_{t-1}$ the effect of GDP growth on net wealth. The interest rate is assumed to be the same for both assets and liabilities.

The residual term, v_t, includes valuation changes in the public sector's financial assets. In Sweden's case, this is particularly significant, as the public sector—unlike in many other countries—holds large non-interest-bearing assets. These assets, in addition to generating direct returns included in the capital balance, also give rise to valuation changes. This includes revaluations of unlisted state-owned enterprises and changes in the value of equity holdings within the state and the old-age pension system. A positive valuation change means that the primary net lending can be lower without weakening the net position. For simplicity, the following analysis assumes that valuation changes are zero.

In the case of a negative net position (i.e. gross debt exceeds assets), primary net lending surpluses are required in the future to stabilise the net position as a share of GDP over time. However, this only applies if the interest-growth differential is positive ($i_t > \gamma_t$), If the differential is instead negative ($i_t < \gamma_t$) the net position stabilises at a certain level even with a primary net lending deficit. If the differential is zero ($i_t = \gamma_t$), a balanced primary budget will stabilise the net debt as a share of GDP.

In the case of a positive net position, the opposite applies—partly because the interest effect becomes an income rather than a cost. Sweden has had a positive net position since 2006.

When the net position is negative, it is easier to achieve a long-term stable level if the interest-growth differential is negative or zero, compared to when it is positive. When the differential is negative, the net position always converges towards a stable equilibrium as a share of GDP, as long as future primary net lending deficits are limited and do not push debt to unsustainable levels. Even when the differential is positive, there exists an equilibrium level for the net position, but it is not automatically stable in the sense that the economy will return to it after a deviation. In such cases, primary net lending must be adjusted to offset the interest cost on the debt in order to stabilise the net position.

[10] See, for example, Burnside (2005), Chapter 2, for a theoretical overview.

[11] Large deficits are also possible if the so-called interest-growth differential is negative (see the margin box "Conditions for Stabilizing the Net Position of the Public Sector").

public sector financial assets largely reside within the pension system, while Maastricht debt is distributed across the state and local government. Because the pension system is self-balancing and cannot incur large, persistent deficits, it is inherently sustainable.

However, the pension system cannot drive long-term deterioration in the net position. It can improve the net position through value increases or surpluses. Yet these assets cannot be used to meet other public needs unless the Swedish parliament changes the rules. Therefore, a net position where rising debt in the state and local sectors is offset by rising pension assets is not deemed sustainable—unless those assets can be reallocated to cover deficits elsewhere.

Other public assets, such as holdings in state- or municipally-owned companies, are often illiquid due to their social function. Thus, a stable net position may still coincide with fiscal unsustainability, especially if Maastricht debt trends upward.

The Size of the Debt Matters

It is also critical that Maastricht debt does not become too large, as a high debt level increases sensitivity to rising interest rates or slowing growth. Larger debt can also lead to higher risk premiums, even when the net position is positive.[12] However, an excessively low debt level is also undesirable, as government bonds are crucial for financial market operations.

There is no universally accepted threshold for "too high" or "too low" debt. For Maastricht debt, it is common to reference Sweden's debt anchor of 35 percent of GDP, the upper limit of 40 percent, or the EU's Stability and Growth Pact ceiling of 60 percent. Some countries manage higher debt levels without losing creditworthiness. The analysis should also consider public assets: a country with large assets can sustain higher debt. However, evaluating what level of net position is unsustainable is even more complex.

Joint Assessment of Net Position and Debt

To conclude, NIER assesses that public finances are sustainable in the long run if neither the financial net position nor the Maastricht debt shows a clear trend of deterioration in the fiscal sustainability projections. A net position that stabilizes or improves, while debt remains stable or falls, is considered sustainable.

Time Horizon

Finally, the time horizon for evaluating net position and debt trajectories is essential. There is no standard horizon for such assessments, and the choice influences conclusions. Demographic

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[12] In the fiscal sustainability projections, however, the interest rate is assumed to be independent of the size of the debt.

uncertainty increases over time, but demographic changes today may have effects lasting decades. NIER has chosen to focus primarily on a 40-year horizon in its main analysis, often supplemented by an 80-year horizon.

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