

Research & Flourish

PRELIMINARY REPORT

2025

POLICY  
RESEARCH

# SURINAME SOVEREIGN WEALTH FUND MODEL

Fiscal Rules, Stabilization Mechanisms and  
Annuity Allocations

Prepared by  
(ir.) Michael James, MSc.

15-11-2025

[mj.eu@outlook.com](mailto:mj.eu@outlook.com)

## **About This Document**

This document represents a preview of an ongoing research project. The content included herein reflects a selection of material drawn from the full research study and is provided solely for demonstration and review purposes. The remaining sections of the study are currently under development. All findings, analyses, and conclusions presented in this preliminary version are provisional subject to refinement in the final publication.

## I. Abstract

Suriname’s discovery of substantial offshore oil reserves presents both an extraordinary opportunity and a profound policy challenge. Without strong fiscal institutions, resource wealth can easily lead to volatility, overspending, and long-term fragility. This is the first part of a broader study which focusses on a **comprehensive framework for a Sovereign Wealth Fund (SWF)** designed to transform volatile oil revenues into stable, rule-based fiscal flows. The framework integrates three components:

1. A **structural fiscal rule** linking spending to long-term oil price averages.
2. A **stabilization buffer** to smooth short-term revenue shocks.
3. A **savings fund** that builds financial assets to generate a permanent annuity.

Through simulation modelling (“Rule Engine”), the study shows how these mechanisms jointly ensure fiscal stability and intergenerational equity. The model is presented in a separate technical report. A cross-country benchmarking analysis further identifies Suriname’s structural strengths and gaps across key sectors. Finally, a priority scoring framework links the SWF’s sustainable annuity to strategic investment areas — education, infrastructure, inclusion, and environmental protection — ensuring that oil wealth contributes to resilient, inclusive, and sustainable growth.

## II. Executive Overview

### Building a Sovereign Wealth Framework for Suriname's Oil Era

Suriname is entering a defining chapter in its economic history. The discovery of large offshore oil reserves presents an extraordinary opportunity to reshape the nation's fiscal and development trajectory. However, the global experience of resource-rich economies shows that oil wealth can easily become a source of instability, debt, and missed opportunities if not managed within strong institutional and fiscal rules. To ensure that oil wealth translates into lasting prosperity, Suriname could benefit from a coherent *Sovereign Wealth Fund* (SWF) framework that anchors fiscal discipline, supports economic resilience, and promotes intergenerational equity.

### Purpose of the Study

This study develops a *comprehensive analytical framework* for designing Suriname's Sovereign Wealth Fund and associated fiscal rules. The goal is not only to manage oil revenues prudently but also to link them to national development priorities in a transparent, data-driven way. Specifically, the study aims to:

- **Design fiscal rules and fund mechanisms** that stabilize oil revenues and ensure long-term savings.
- **Simulate macro-fiscal scenarios** using a dynamic “Rule Engine” to test how stabilization, savings, and spending interact over time.
- **Benchmark Suriname against peer economies** to identify key sectoral gaps and strengths.
- **Develop a priority framework** that connects sustainable fiscal flows (the fund's annuity) to strategic investment areas such as education, infrastructure, and inclusion.

### Analytical Approach

The research combines quantitative modelling and comparative policy analysis:

- A **Rule Engine simulation** models the flow of oil revenues through structural pricing, stabilization buffers, and savings tranches, producing a stable annuity stream for the national budget.
- A **cross-country benchmarking exercise** identifies where Suriname leads or lags relative to peers across education, health, infrastructure, inclusion, and environment.
- A **priority scoring framework** ranks sectors based on empirical gaps and growth multipliers, ensuring that limited resources are allocated where impact is highest.
- Finally, **allocation scenarios** translate the sustainable annuity into realistic sectoral investment envelopes.

### Expected Outcomes

By the end of this study, the aim is to provide:

- A **fiscal rule design** suited to Suriname's context that is credible and transparent
- A **simulation-based understanding** of how savings, buffers, and annuity mechanisms behave under oil price volatility.
- A **sectoral prioritization framework** helping policymakers decide where to channel stable revenues for maximum long-term benefit.
- A **policy roadmap** for aligning the Sovereign Wealth Fund with Suriname's broader development strategy.

### **Significance of the Study**

Suriname's oil wealth can either entrench volatility or catalyse diversification. With strong rules, disciplined savings, and transparent allocation, it can finance the country's transition toward a resilient, inclusive, and sustainable economy. This study lays the analytical and institutional foundation for that transformation.

### III. Table of Contents

<b>I. Abstract</b> . . . . .	iii
<b>II. Executive Overview</b> . . . . .	iv
<b>III. Table of Contents</b> . . . . .	v
<b>1. Background and Rationale</b> . . . . .	1
<b>2. Research Objectives</b> . . . . .	2
<b>3. Research Framework</b> . . . . .	3
<b>4. Phase A   Scoping and literature</b> . . . . .	4
<b>5. Phase B   Data Collection, Cleaning and Exploration</b> . . . . .	6
5.1 Building the reproducible data pipeline . . . . .	6
5.2 Data Exploration . . . . .	7
<b>6. Phase C   Descriptive and Comparative Analysis</b> . . . . .	10
6.1 Descriptive exploration to create a visual atlas . . . . .	11
6.1.1 Coverage Heatmap (data completeness) . . . . .	12
6.2 Stylized Facts . . . . .	13
6.3 Foundations of Econometric Analysis . . . . .	17
6.4 Extending the model with controls . . . . .	22
6.4.1 Extending the model for Suriname only with controls . . . . .	24

# 1. Background and Rationale

Suriname, a small South American nation with a population of just over 600,000, is at a pivotal moment in its economic trajectory. The country is on the cusp of a major economic transformation as offshore oil discoveries are set to generate significant new revenues. The central challenge lies in ensuring that this income is effectively translated into long-term, broad-based economic development rather than contributing to economic volatility or the 'resource curse'. This research provides evidence-based policy recommendations on how Suriname can strategically allocate and manage oil revenues to strengthen key development sectors such as infrastructure, education, social development and environmental sustainability.

Offshore oil discoveries made in recent years by international consortia (including TotalEnergies and APA Corporation, in partnership with Staatsolie, Suriname's state oil company) have positioned the country as a potential new oil producer in the region. Estimates suggest that Suriname's oil reserves may reach billions of barrels, with first production anticipated before the end of the decade. The scale of these discoveries has the potential to fundamentally reshape Suriname's economy, state finances, and development prospects.

At present, Suriname faces significant development challenges. The country's economy has historically relied on extractive industries (bauxite, gold, and oil), resulting in vulnerability to commodity price fluctuations. Public debt levels remain high, inflationary pressures have been persistent, and poverty affects a substantial portion of the population. Infrastructure gaps — in transport, energy reliability, and digital connectivity — hinder broader economic diversification. Human capital development lags regional peers, with education outcomes and labour force skills not yet aligned to future growth sectors. The country is also highly exposed to environmental risks, including flooding and climate change impacts, which exacerbate vulnerabilities in the built environment.

The arrival of large-scale oil revenues thus presents both a historic opportunity and a profound challenge. If managed effectively, oil income could fund transformative investments in infrastructure, education, tourism development, and urban resilience, while supporting macroeconomic stability and fiscal sustainability. However, without robust governance and strategic planning, Suriname risks repeating the experiences of other resource-dependent economies that fell victim to the "resource curse": revenue volatility, Dutch disease effects, rent-seeking, and institutional weakening.

This research is designed to provide Suriname's policymakers and development partners with a comprehensive, evidence-based strategy for converting oil revenues into broad-based and sustainable economic development. It will combine rigorous quantitative modelling of economic impacts with qualitative insights from stakeholders and comparative case studies, producing policy recommendations tailored to Suriname's unique context.

## 2. Research Objectives

The objective of this research is to develop a **comprehensive fiscal and institutional framework** that enables Suriname to transform its forthcoming oil revenues into sustainable, inclusive, and long-term prosperity. The study is built around the creation of a **Sovereign Wealth Fund (SWF)** that integrates three key functions: stabilization, savings, and predictable fiscal support to development.

Using a dynamic simulation model — the **Rule Engine** — the research tests how different oil price paths, production levels, and fiscal rules would affect revenue stability, debt, and long-term savings. Complementing this, a benchmarking analysis compares Suriname’s performance with peer countries to identify priority investment gaps across education, infrastructure, health, and inclusion. These insights are synthesized into a priority scoring framework that guides how limited, stable resources (the SWF annuity) can be allocated to maximize growth and resilience. Ultimately, the research provides Suriname with a data-driven roadmap for managing oil wealth prudently — avoiding volatility and ensuring that today’s windfall translates into durable national assets.



### 3. Research Framework

This section lays out how this study is structured into different phases and their deliverables.

#### **Phase A | Scoping and literature**

- Determination of the project scope and tools required to answer the main objectives. Compile data sets and documents (e.g. Suriname SSFS law, IMF Article IV, World Bank country review, NREGI guidance).

#### **Phase B | Data Collection, Cleaning and Exploration**

- Download macro, fiscal, social, and energy datasets (e.g. World Bank, IMF WEO, BP/IEA/IEE, Rystad/industry press for reserves/production forecasts, national budget docs).
- Deliverable: clean R data objects and a reproducible data pipeline.

#### **Phase C | Descriptive and Comparative Analysis**

- Time series of GDP, government revenue, public debt, oil rents, FX reserves, exchange rates, CPI, unemployment, poverty, HDI, sector shares.
- Comparative metrics versus Norway, Timor-Leste, Ghana, Guyana, Azerbaijan.
- Deliverable: reproducible R markdown report.

#### **Phase D | Scenario and Econometric Modelling**

- Build oil price & production paths.
- Fiscal modelling: envelope of expected revenues, public spending envelopes under alternative fiscal rules (structural balance rule, fixed % withdrawal, smoothing rules).
- Macro modelling: simple Simulations —, non-oil GDP, government debt; regressions and structural scenario modelling.
- Deliverable: a technical report as part of the main report including simulation code (R).

#### **Phase E | Policy Recommendations and Implementation Plan**

- Fiscal rules (withdrawal limits, countercyclical buffers), SWF design (objectives, governance, transparency, investment policy), investment prioritization (human capital, infrastructure, diversification).
- Deliverable: policy brief + prioritized action plan with data-backed justifications.

## 4. Phase A | Scoping and literature

The study will employ a mixed-methods approach, combining advanced quantitative statistical modelling (using R-based analysis) with qualitative methods (case studies and policy analysis). This section lays out the overall scope of the research including the sources, tools and indicators that could be used.

### Key Datasets for Macro & fiscal

Readers are encouraged to consult additional sources for further insight into the following relevant subtopics.

- GDP (current & constant USD), GDP per capita — [World Bank](#).
- Government revenue, government expenditure, public debt (% GDP) — IMF/World Bank & Suriname budget documents. [International Monetary Fund](#)
- Exchange rate, CPI — World Bank / national bank.

### Empirical analyses and methodology

- **Regression and causal checks:** regress non-oil GDP growth on indicators, include controls to check for confounding. Use robust standard errors and sensitivity checks.
- **Prediction and cross-validation:** use smoothing, regression, and cross-validation to build models that forecast oil prices.
- **Simulations:** development of the annuity engine to compute oil price and production revenues and fiscal envelopes under withdrawal rules.
- **Policy evaluation:** estimate fiscal multipliers to prioritize spending areas.

### Comparative case studies — why these countries

- **Norway:** gold standard for large SWF + strict fiscal rule and transparency; useful for institutional design and investment strategy. [Norges Bank Investment Management](#)
- **Timor-Leste:** strong lessons on a small economy creating a petroleum fund but facing governance/capacity limits. [Natural Resource Governance Institute](#)
- **Ghana:** example of splitting revenues into stabilization vs heritage funds; lessons on governance and spending. [Bank of Ghana](#)
- **Guyana:** rapid growth example; watch out for governance and Dutch disease [risks](#).

### Preliminary policy instruments to evaluate and scenario testing

- **Sovereign Wealth Fund** (clear objectives: stabilization vs savings vs development) + investment policy & spending rules.
- **Fiscal rule:** e.g., withdraw  $x$  % of fund assets annually or structural balance rule (link withdrawals to non-oil GDP).
- **Reserve/hedging instruments:** e.g. buffer accounts.
- **Targeted public investment:** human capital (education/health), infrastructure (roads/ports), social developments — likely fiscal multipliers will be evaluated.
- **Institutions:** procurement reform, transparency, independent fiscal council, parliamentary oversight (analysis to follow in Part 2 of the study).

- **Social programs:** conditional cash transfers vs lump-sum citizen payments — compare long-term effects (analysis to follow in Part 2 of the study).

## **Risks & data limitations**

Industry production/reserve estimates can shift rapidly; many figures are company projections and uncertain — these will be treated as scenario inputs, not facts.

- Some fiscal data series are only available via IMF country reports or national budget docs — The tables will be extract from PDFs when necessary.

## 5. Phase B | Data Collection, Cleaning and Exploration

In phase B the actual real data will be pulled into R and tidy it so in later phases (descriptive analysis, modelling, policy scenarios) it will run smoothly.

### 5.1 Building the reproducible data pipeline

Since coding in **R**, the best format to pull data into the R environment depends on how it will be handled. The **csv** file format is preferred considering it has a number advantages: (`read.csv` or `readr::read_csv` functions), lightweight, portable, works across all platforms and recommended for quick import + wrangling.

#### Core datasets

For fiscal projections (oil revenue context), the International Monetary Fund (IMF) has been considered the most adequate [source](#). The World Bank data (WDI) is too patchy; therefore, the decision prioritise the use IMF data has been taken with the following trade-offs:

#### World Development Indicators (World Bank)

- + Easy to pull directly into R (no manual downloads).
- + Good for broad, long-term macro data (GDP, trade, population, etc.).
- Often lags by 1–2 years.
- Fiscal data (revenue, spending, debt) is sparse or missing for small economies like Suriname.

#### World Economic Outlook (IMF)

- + Contains fiscal and macro indicators (revenue, expenditure, debt, GDP, inflation, current account) in one place.
- + More up-to-date than WDI (forecasts up to 5 years ahead).
- + Consistent methodology across countries (so comparisons are easier).
- Requires more manual wrangling (pivoting, cleaning).
- Might not cover certain social indicators (e.g., population, human capital).

Best practice would be to use IMF WEO for fiscal, external, and macro projections and supplement the data with World Bank WDI for structural indicators (population, education, poverty, inequality, institutions) when necessary.

## Core indicator codes from WEO

Table 5.1 gives an example of the key fiscal and macroeconomic indicators from the IMF WEO from which data can be pulled in R.

Category	WEO Code	Meaning
Output	NGDPD	GDP, current prices (US\$)
	NGDPDPC	GDP per capita (US\$)
	NGDP_RPCH	Real GDP growth (%)
Fiscal	GGR_NGDP	General government revenue (% of GDP)
	GGX_NGDP	General government expenditure (% of GDP)
	GGXWDG_NGDP	General government gross debt (% of GDP)
	GGXONLB_NGDP	Non-oil balance (% of GDP) — if available
External	TX_RPCH	Export volume growth (%)
	BCAL_NGDPD	Current account balance (% of GDP)
Prices	PCPIPCH	Inflation, average consumer prices (%)

Table 5.1: Fiscal and macroeconomic indicators from IMF WEO.

## 5.2 Data Exploration

Initially the IMF-based dataset has been cleaned and visualised with fiscal + macro indicators for Suriname including comparison countries has been created. The reader is referred to the technical report file to view the reproducible code created to explore and visualise the data.

The cleaned IMF dataset allows for the exploration of Suriname's trends over time and visualise the country's GDP growth, inflation, current account, debt, revenue/expenditure over time.

Suriname is benchmarked against peer countries (Norway, Timor-Leste, Ghana, Guyana, Azerbaijan) to show how Suriname's trajectory compares to other resource-rich economies and help frame Suriname's fiscal space, growth volatility, and oil-revenue challenges in context. The macroeconomic data is summarised in the following graphs presented in the figures 5.1 and 5.2. Finally, summarising plots for the fiscal data are presented in the figures 5.3 and 5.4.

Figure 5.1 shows GDP growth and inflation development for Suriname.

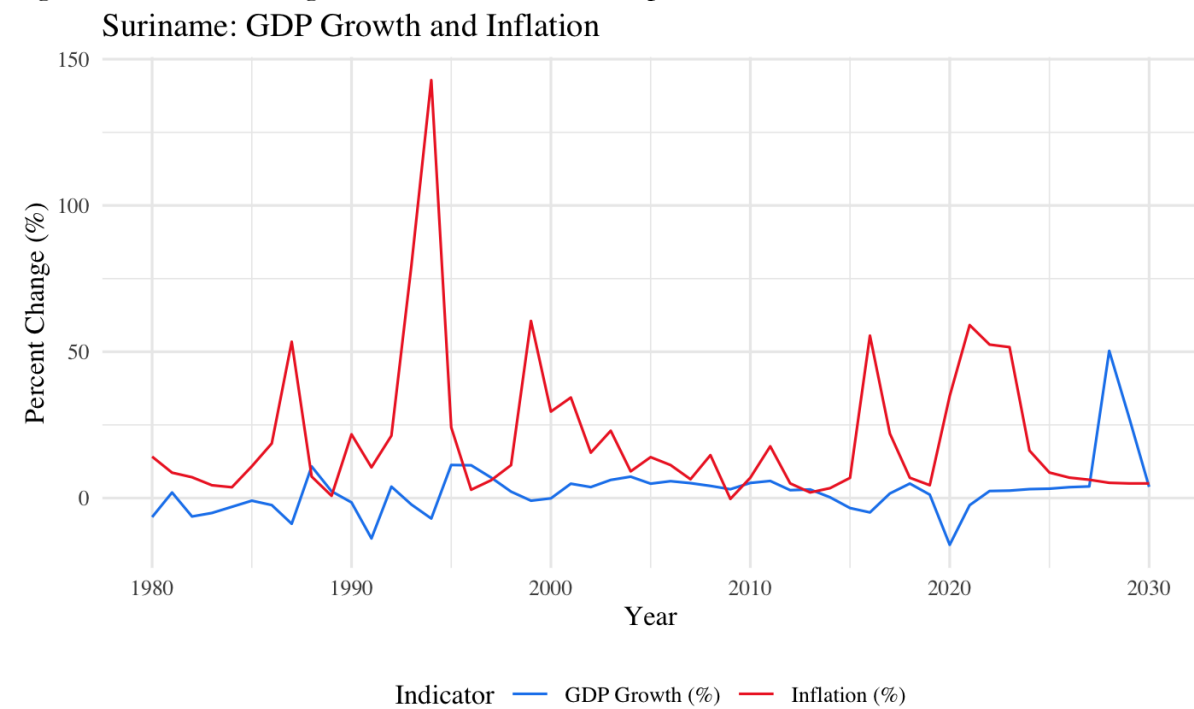


Figure 5.1: Suriname GDP Growth and Inflation.

Figure 5.2 shows the GDP growth and inflation development for Suriname and peer countries.

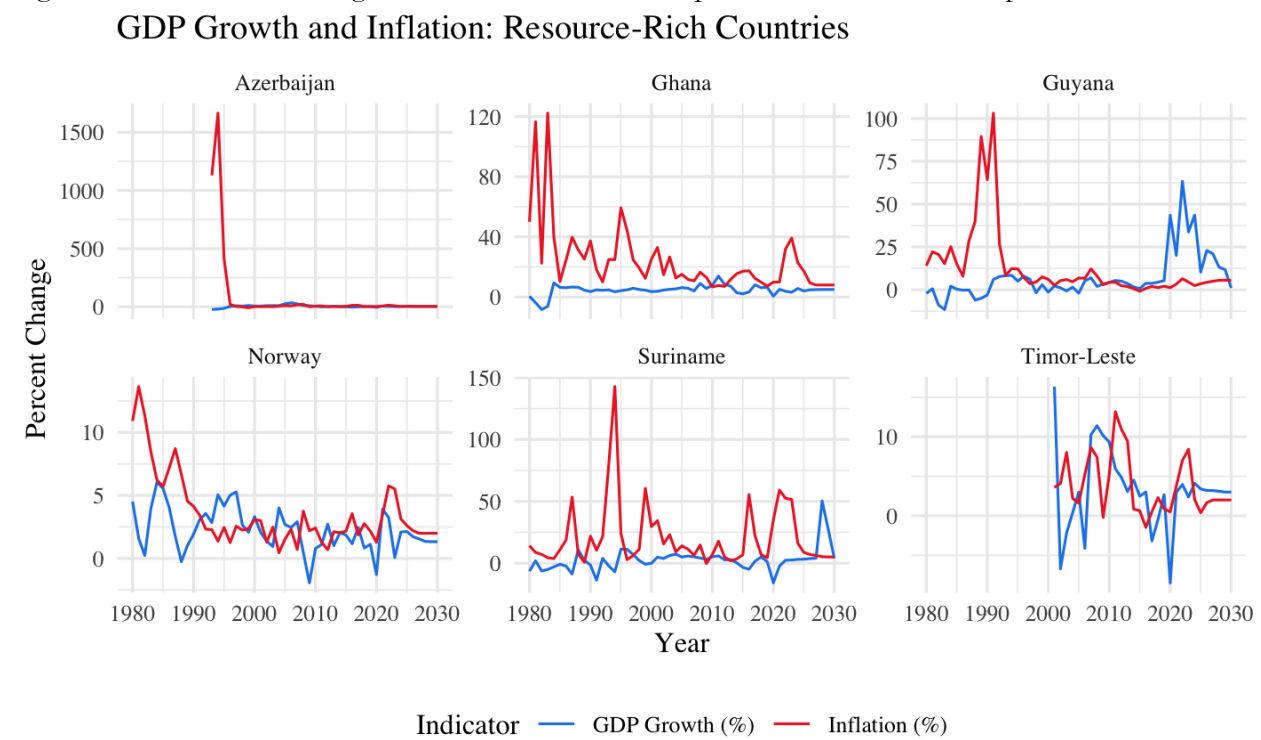


Figure 5.2: GDP Growth and Inflation development for Suriname and peer countries.

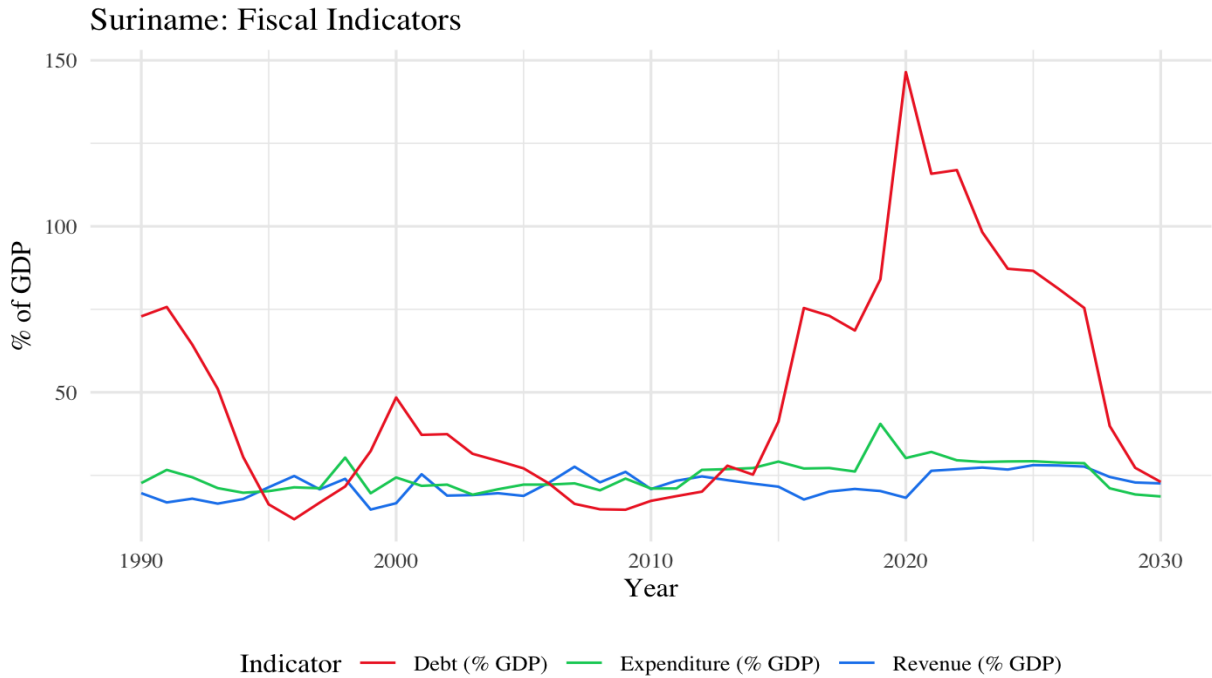


Figure 5.3: Suriname fiscal indicators.

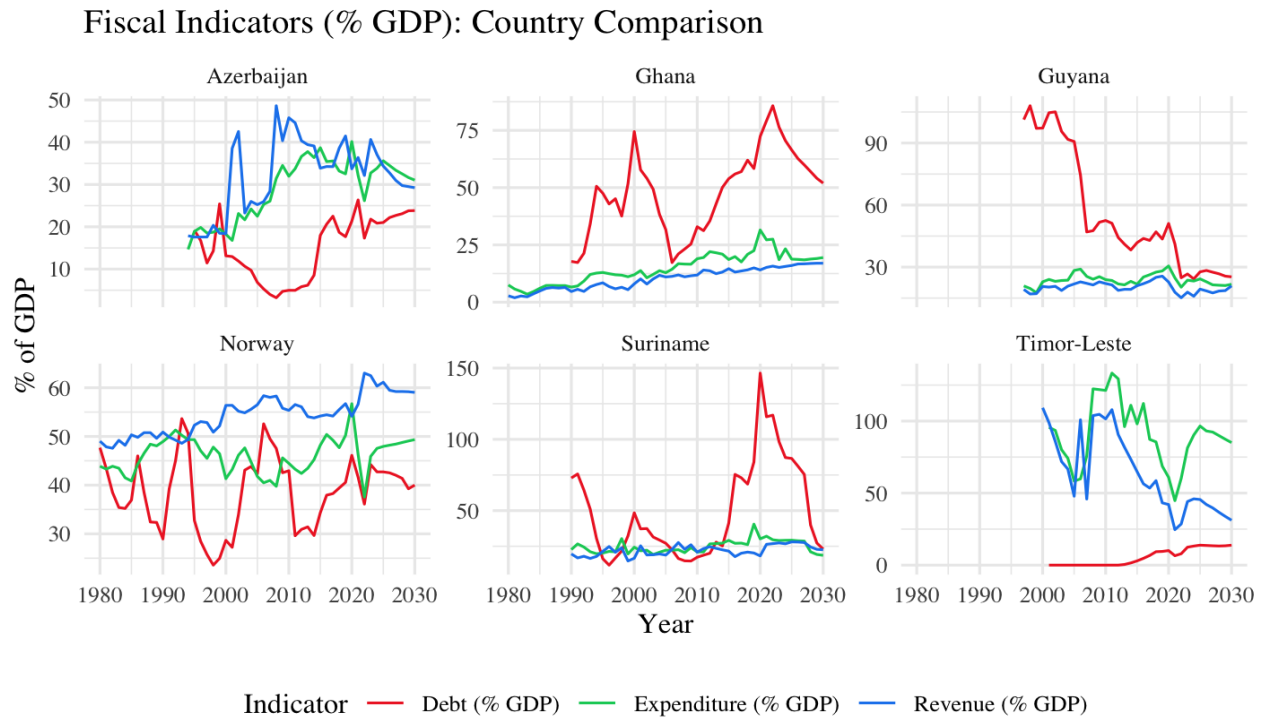


Figure 5.4: Fiscal indicators for Suriname and peer countries.

With Suriname's **macroeconomic (growth + inflation)** and **fiscal (revenue, spending, debt)** time series visualized from the IMF WEO data, the data wrangling & visualization foundation stage has now been completed.

## 6. Phase C | Descriptive and Comparative Analysis

This phase moves beyond descriptive plots and starts analysing patterns, thus transitioning from descriptive data exploration to structured comparative analysis. The guiding inquiry is: what can Suriname learn from other resource-rich economies about managing oil revenues for sustainable growth?

### **Macro–Fiscal Dynamic**

Examine correlations between oil driven economic surges.

- GDP growth volatility
- Government revenue vs. expenditure
- Debt accumulation

### **Compare Suriname to Peers**

- Norway (success story: strong fiscal rules, sovereign wealth fund).
- Ghana, Guyana, Timor-Leste, Azerbaijan (mixed experiences).

### **Econometric Angle**

- Run panel regressions (country-year) to see how fiscal balance and debt respond to oil revenue shocks.
- Explore whether higher oil revenues lead to higher growth or more volatility.

The cleaned IMF data will be used to build a combined macro–fiscal panel dataset that will allow for regressions and deeper comparisons in the following subsections.



## 6.1 Descriptive exploration to create a visual atlas

Plots are created by looping through each indicator in the panel dataset as shown in figure 6.1. For each, a multi-country time-series line plot is produced with Suriname in green. This gives a visual atlas of Suriname vs. peers.

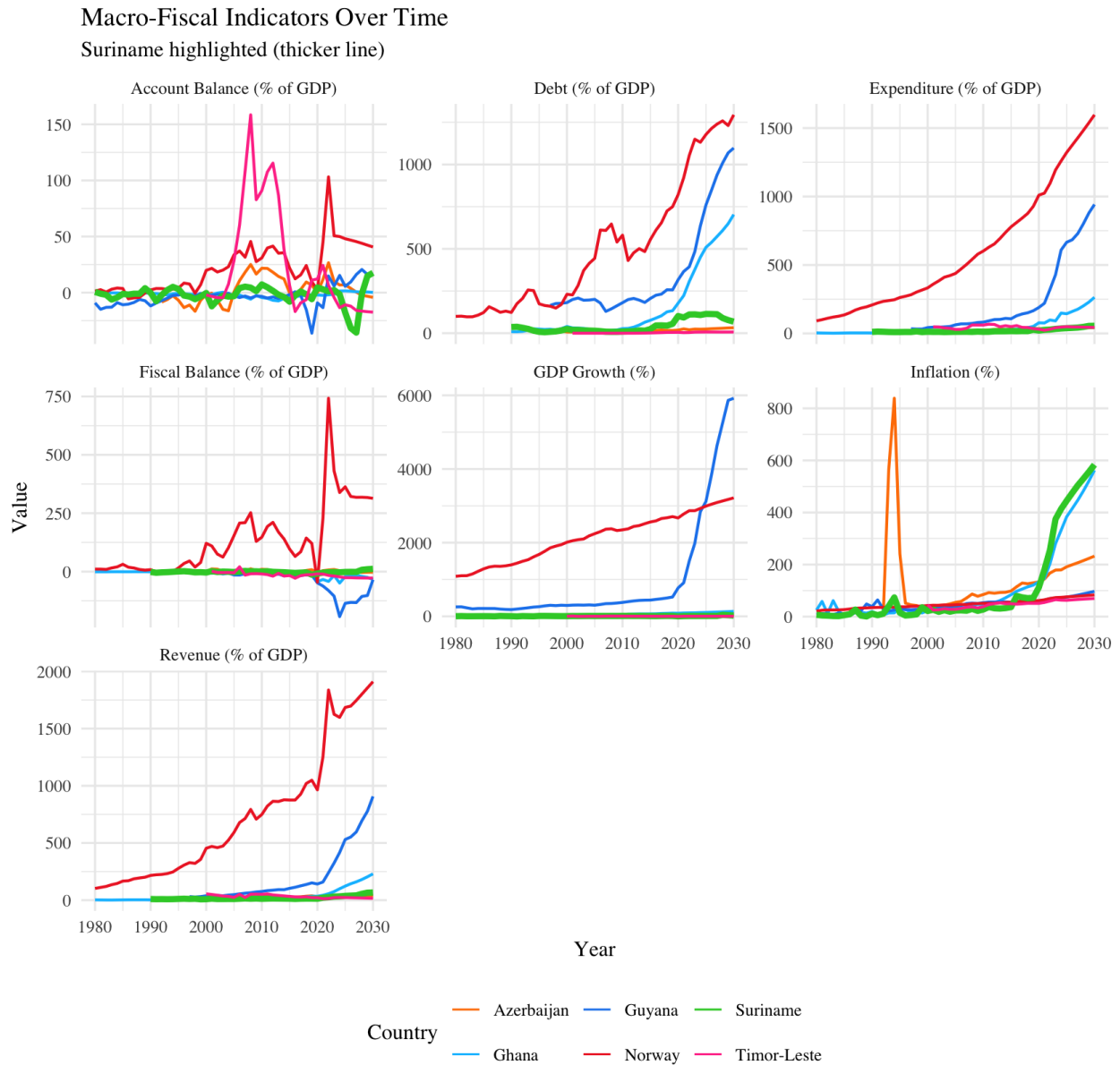


Figure 6.1 fiscal indicators for peer countries overtime.

Figure 6.2 presents plot similar to those in figure 6.1 of the same fiscal indicators on a logarithmic scale which gives an overview of the fiscal profile — how Suriname’s government finance dynamics compare to peers.

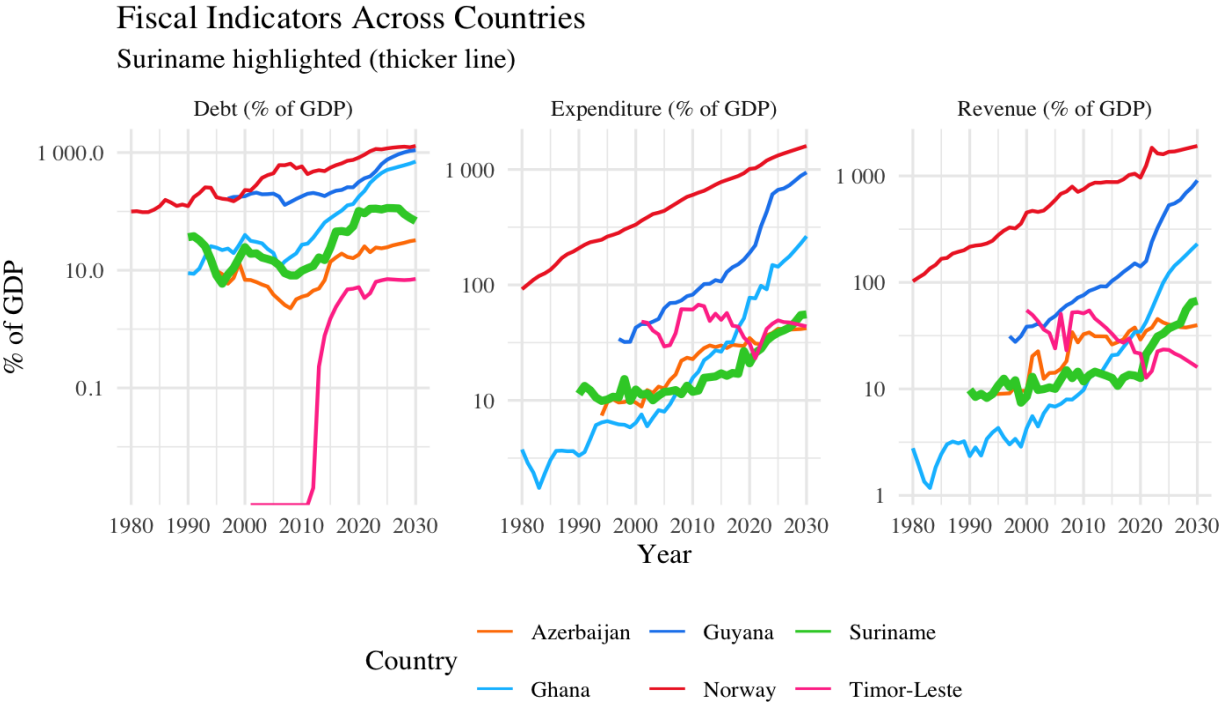


Figure 6.2 fiscal indicators logarithmic scale across countries.

### 7.2 Coverage Heatmap (data completeness)

For each indicator–country–year cell, it is verified if the data is or is not available (NA) in order to produce a heatmap (countries on y-axis, years on x-axis) for each indicator on a combined panel. It highlights which data are patchy and which are well covered before econometric analysis.

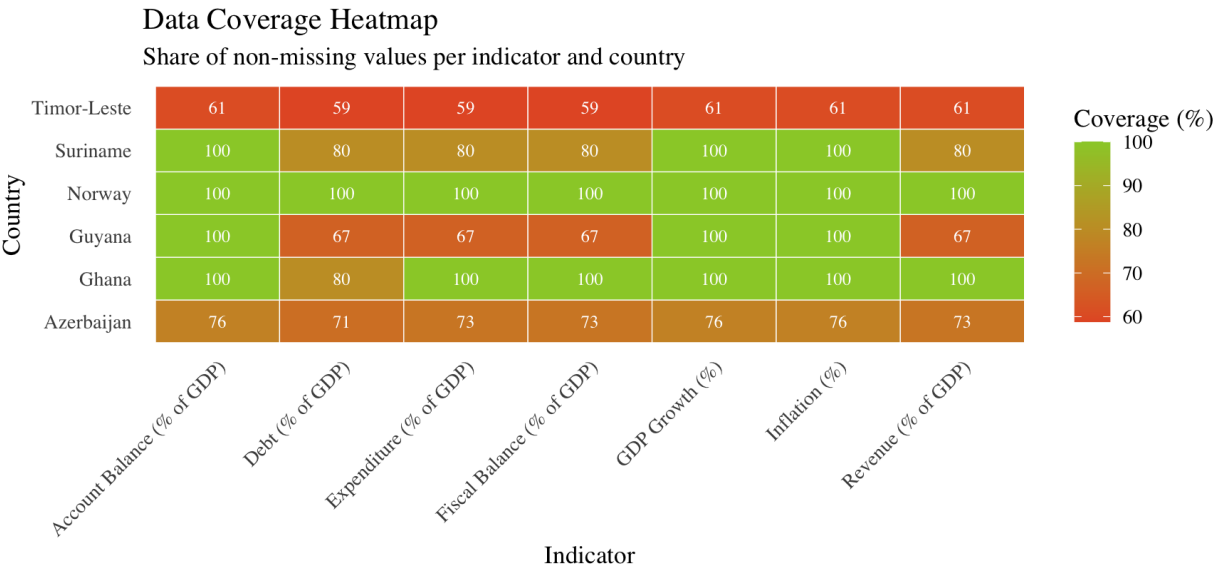


Figure 6.3: Data coverage heatmap.

## 6.2 Stylized Facts

### Context: Why Model Debt?

Public debt stands at the core of economic analysis because it links a country's **past decisions, present policies, and future constraints**. Debt is more than an accounting measure — it reflects how governments balance their ambitions for growth and development with fiscal and financial discipline. Modelling debt dynamics helps reveal whether a country's fiscal path is sustainable, how responsive it is to policy changes, and how external or macroeconomic shocks (such as inflation or growth fluctuations) transmit through its public finances. In essence, debt captures the cumulative outcome of a nation's choices — spending, taxation, borrowing, and investment — and determines its room to manoeuvre in the future. By examining how fiscal balance, growth, inflation, and resource rents shape debt, it can be understood how both the **mechanics** of fiscal sustainability and the **character** of economic management. Debt, therefore, is not simply a number; it is a reflection of a country's economic structure, credibility, and long-term policy priorities.

The next step is to go beyond line plots and start exploring relationships between variables:

- Revenue vs. Debt (% GDP) (fiscal sustainability).
- Growth vs. Fiscal Balance (fiscal stance vs. growth).

This will help test stylized relationships and set the stage for analysing how Suriname could use oil revenues sustainably.

First a panel regression of Revenue vs Debt (fiscal sustainability) is made to answer the question: what is the relationship between government revenue and government debt levels across countries?

More specifically:

- Do countries with higher government revenues (as a share of GDP) also tend to have higher or lower government debt (as a share of GDP)?
- How does this relationship vary across countries and over time?

Figure 6.4 presents the relation between government debt and revenue as percentage of GDP. The dashed line (a linear trend) suggests the direction and strength of that association.

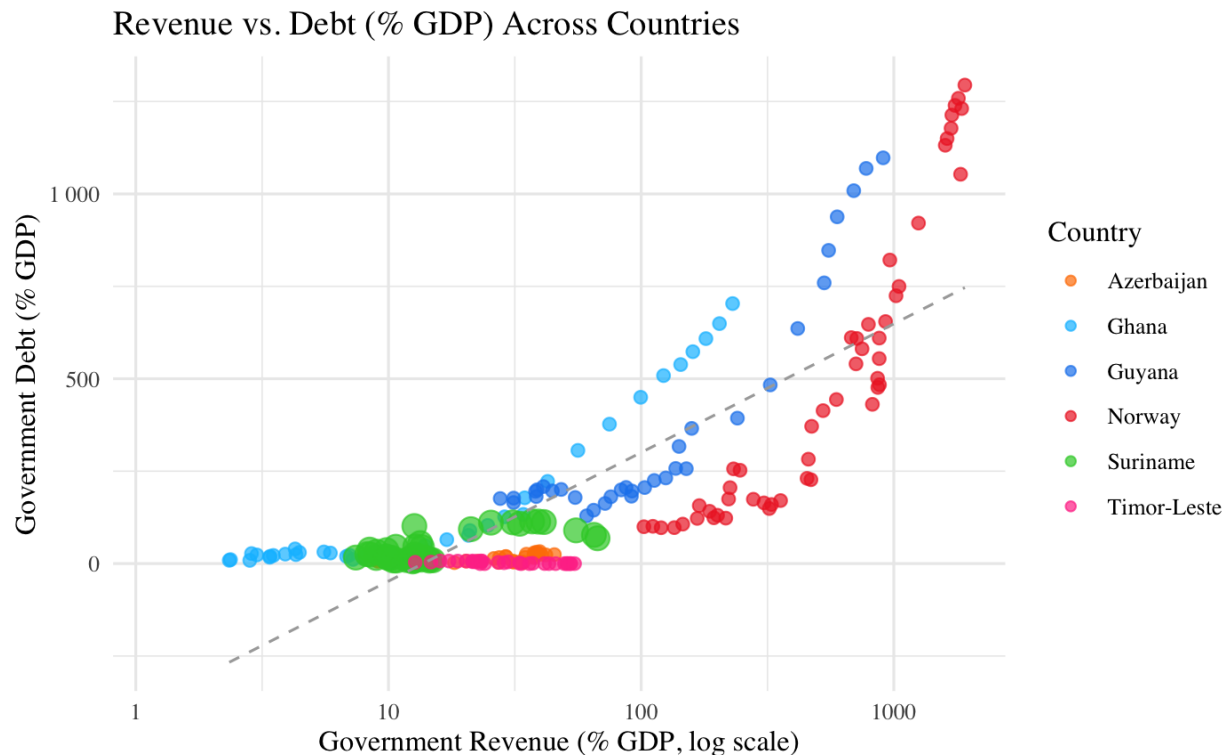


Figure 6.4: Revenue vs debt across countries.

The trend line slopes upward, implying a positive association which mean that countries with higher revenues tend to have higher debt levels. There's substantial variation across countries:

- Norway has high revenues and high debt, which might be influenced by sovereign wealth fund dynamics or public investment strategies.
- Timor-Leste and Azerbaijan appear to have low revenue and low debt.
- Suriname clusters in the middle with relatively stable revenue and moderate debt.

What this graph does *not* show:

- It shows levels, not flows or changes, so it doesn't reveal how debt builds up over time from fiscal imbalances.

### Interpretation summary:

Countries with more fiscal capacity (i.e. higher revenue collection relative to GDP) often also manage higher debt burdens — perhaps because they are more creditworthy, or because they have broader tax bases and can sustain more borrowing. This is a known phenomenon in fiscal economics: high-capacity states can carry more debt without triggering instability.

Next, a panel regression of GDP Growth vs Fiscal Balance (fiscal stance vs growth) is made to answer the question: do countries running faster-growing economies tend to have lower deficits or even surpluses?

In theory, during periods of high economic growth, governments tend to collect more tax revenue through automatic stabilizers and may reduce countercyclical spending. As a result, fiscal deficits typically shrink, and in some cases, surpluses emerge. In this sense, stronger economic growth is expected to improve overall fiscal performance. Figure 6.5 shows the relation between GDP growth and fiscal balance for Suriname and peer countries.

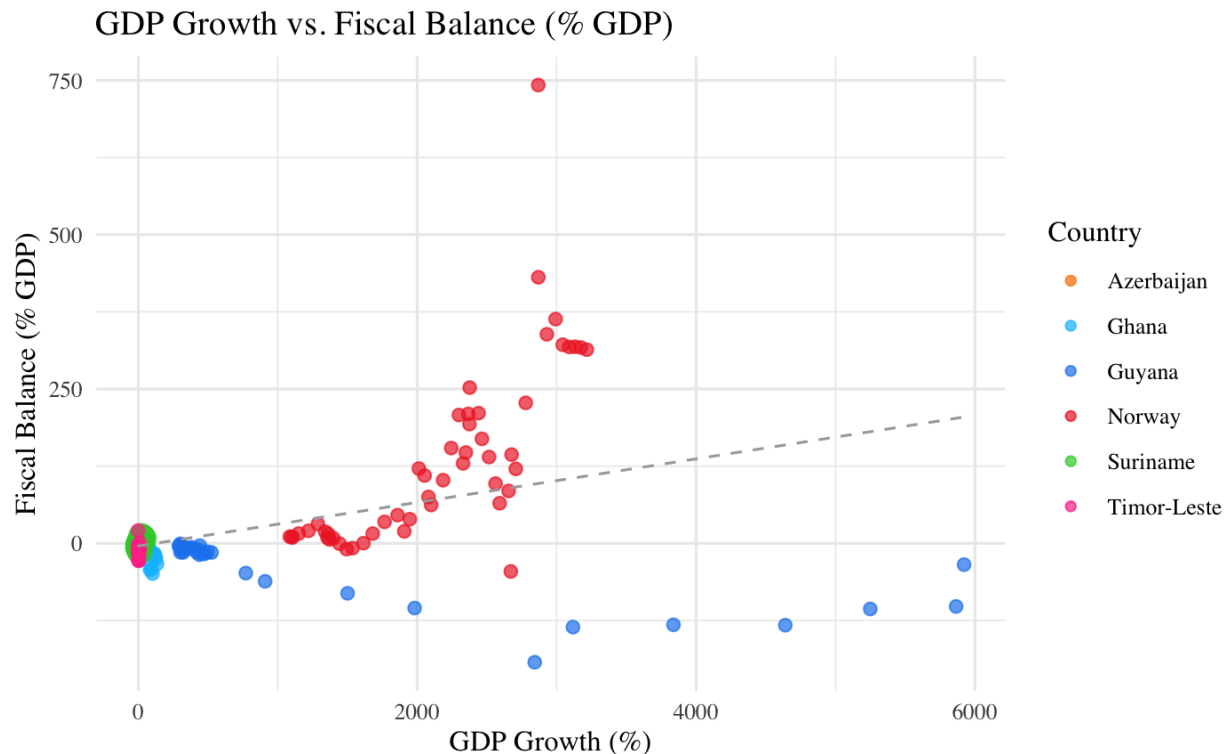


Figure 6.5: GDP Growth vs. Fiscal Balance (% of GDP).

The overall pattern shows dashed trendline slopes upward which leads to a positive relationship, thus higher GDP growth is associated with higher fiscal balances meaning smaller deficits or bigger surpluses. There are outliers:

- **Norway** dominates the higher GDP growth values — extremely high values (likely due to oil/gas revenues or base effects)
- Other countries like **Guyana** also show massive spikes in GDP growth — probably from resource shocks or base effects
- The cluster of most countries is around 0–20% GDP growth and fiscal balances between -10% and +10%

So, while the trend is positive, it's influenced heavily by a few countries with extreme values.

What this graph does *not* show:

- **Causality:** It does not show whether GDP growth causes improved fiscal balance, or vice versa
- **Time dynamics:** It's a scatter plot — not a time series, therefore it is not possible to see how growth and fiscal balance evolve over time
- **Heterogeneity:** It is not distinguishable whether the relationship is the same across all countries — Norway looks very different from Guyana, etc.

### **Interpretation summary**

Do faster-growing economies have better fiscal positions? The plot suggest: Yes — countries with higher GDP growth tend to have stronger fiscal balances (smaller deficits or larger surpluses). However, this conclusion is tentative, because the result appears heavily influenced by a few outliers (especially Norway and Guyana). Further regression and robustness checks will strengthen the conclusion (e.g., through fixed-effects controlling for country/time).

## 6.3 Foundations of Econometric Analysis

Initially a panel regression has been performed of government debt (% GDP) on fiscal balance (% GDP) across countries. Running a regression across countries provides a *general relationship* (e.g., surpluses reduce debt).

- Fiscal balance (% GDP) (revenue – expenditure). A surplus reduces debt; a deficit increases debt.
- Debt (% of GDP) reflects the accumulation of past fiscal deficits and surpluses.
- Intuition: If countries run persistent deficits, debt ratios should rise. If they run surpluses, debt ratios should stabilize or fall.

For Suriname, this is important because oil revenues could allow for fiscal surpluses (if saved), helping to stabilize debt. Inversely, if revenues are spent quickly (deficits), debt could spiral. Thus, two key questions arise:

- Is it empirically clear that higher fiscal balance is associated with lower debt across countries?
- how strong is this relationship?

The relationship between government debt and fiscal balance for Suriname is presented in figure 6.6.

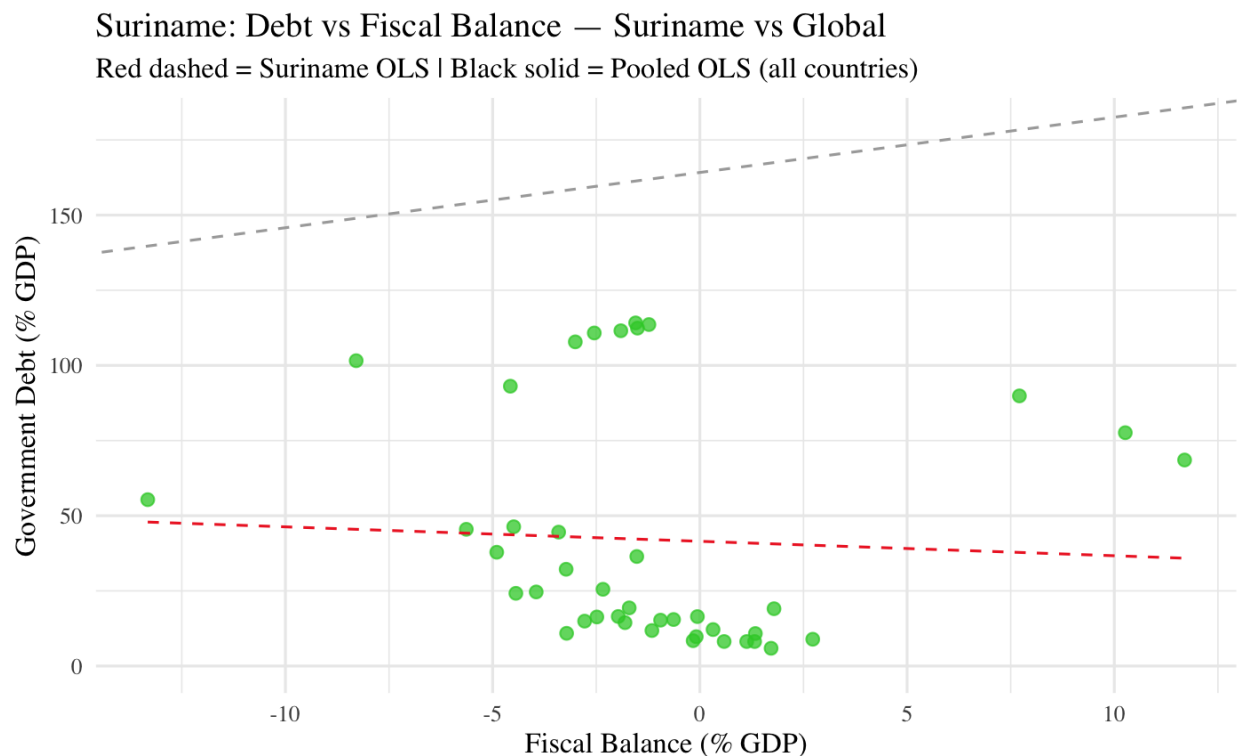


Figure 6.6: Suriname vs Global debt vs fiscal balance (% of GDP).

## Interpretation

The estimated coefficient (slope) on fiscal balance captures the relationship between the fiscal balance (% of GDP) and government debt (% of GDP) across countries over time.

- A **negative coefficient**—the theoretically expected outcome—indicates that higher fiscal balances (i.e., smaller deficits or larger surpluses) are associated with lower levels of public debt.
- Conversely, a **positive coefficient**, though unlikely, would suggest an anomalous relationship in which countries with stronger fiscal balances nonetheless exhibit higher debt ratios. Such a result could reflect structural characteristics, measurement issues, or lags between fiscal outcomes and debt accumulation.

The inclusion of country fixed effects accounts for persistent, country-specific factors influencing debt levels (for example, Norway’s structurally lower debt regardless of annual fiscal performance). Note: This specification is a descriptive panel regression, not a causal model. Its purpose is to assess the empirical association—rather than the causal effect—between fiscal balance and public debt.

## Does Suriname follow the global pattern?

Figure 6.6 shows Suriname’s trendline moving in opposite direction of the global trendline, this could mean that Suriname may have structural issues (weak institutions, shocks, or poor debt management). This is important because on average across countries, a higher fiscal balance should lead to lower debt. However, countries may deviate from that expectation due to: commodity dependence (oil, gold in Suriname), debt restructuring episodes (default, IMF program) or institutional weaknesses (governance, fiscal discipline). Plotting Suriname alone helps us see whether its debt actually responds to fiscal balance, or if other forces dominate.

## Interpretation guide

The reader is referred to the technical report – C4 to view the code.

- **What is expected:** The coefficient (slope) on fiscal balance is expected to be negative, *i.e.*, higher fiscal balances (surpluses) are associated with lower debt ratios.
- **model\_debt\_fb (FE):** gives the slope after absorbing country-specific fixed levels (best for testing the within-country relationship). If that slope is significantly negative, it supports the basic logic that deficits raise debt within countries.
- **model\_pooled\_lm:** useful for a visual global line and gives a simple average slope across all observations. It may differ numerically from the FE slope because it ignores country fixed effects.
- **model\_sur:** explains whether Suriname’s own slope is similar or different from the global average. If Suriname’s slope is much smaller (in absolute value), then fiscal balance changes there are less effective at moving debt — perhaps because of debt restructuring, external shocks, or institutions.

As can be seen in the figure 6.6, Suriname deviated from the global (pooled) slope which is positive, while Suriname’s slope is negative.



### **Why the Global Slope Appears Positive**

The positive global slope in the pooled regression does not reflect a genuine global relationship between fiscal balance and debt. Instead, it is largely driven by country composition effects, most notably the influence of Norway.

Norway consistently records large fiscal surpluses, primarily due to substantial oil revenues. Despite these surpluses, the Norwegian government continues to issue public debt, not to finance deficits, but to provide safe assets and maintain liquidity in domestic bond markets. Consequently, Norway exhibits both high fiscal surpluses and relatively high gross debt, which runs counter to the conventional expectation that stronger fiscal balances should correspond to lower debt.

From an accounting perspective, this pattern stems from the treatment of gross versus net debt. Norway's gross government debt is reported separately from its sovereign wealth assets held in the Government Pension Fund Global. When measured on a net basis, Norway is a substantial creditor nation, but in gross terms it appears as a high-debt, high-surplus country.

This outlier effect exerts a disproportionate influence on the pooled (global) OLS estimate, biasing the slope upward and creating the misleading impression that stronger fiscal balances are associated with higher debt levels across countries.

### **More generally**

While reverse causality may still play a role—since high-debt countries tend to adopt tighter fiscal policies under market or IMF pressure—the primary driver of the positive global slope in this sample is heterogeneity among resource-rich countries. For example, large oil-exporting economies with substantial fiscal surpluses (like Norway) differ from smaller resource exporters in their debt management and fiscal strategies, which affects the overall pooled relationship.

### **Why Suriname's Slope is Negative**

Suriname exhibits the expected negative relationship between fiscal balance and debt: improvements in the fiscal balance are associated with declines in government debt. This pattern reflects two key factors:

- Direct fiscal impact on borrowing needs: Changes in the fiscal balance have an immediate effect on the country's debt requirements. Unlike economies with large financial buffers, Suriname's borrowing largely mirrors its budgetary position, so fiscal tightening tends to reduce debt accumulation.
- Limited financial buffers: Suriname lacks extensive sovereign wealth funds or other fiscal stabilization mechanisms. Consequently, its debt dynamics respond more directly to changes in fiscal policy, without the mitigating effects that wealthier resource-exporting countries can exhibit.

Figure 6.7 show how Norway might be biasing the data. The blue line represents the slope of all countries without Norway.

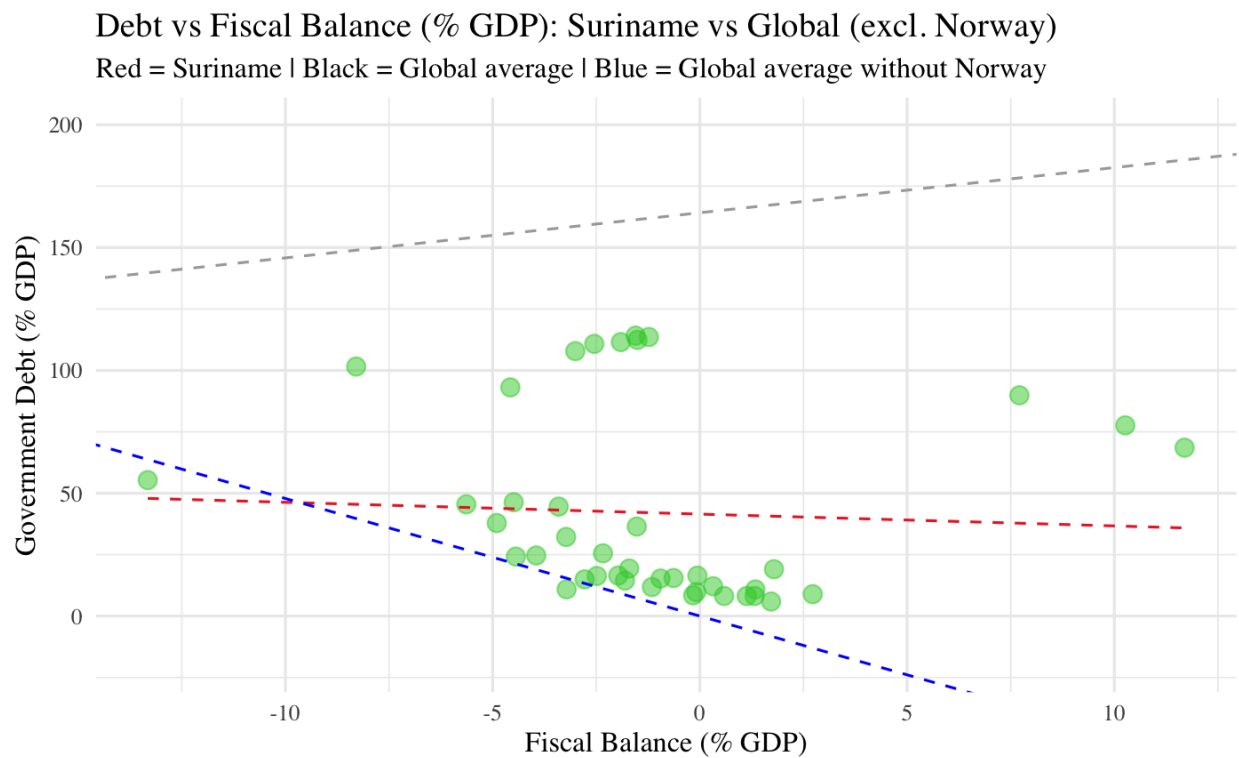


Figure 6.7: Debt vs fiscal balance (% GDP) excl. Norway.

This matters because if the slope flips (or weakens a lot) when Norway is removed, then Norway was driving the global result. If the slope stays positive and significant, then the Suriname vs. Global difference is real and broader, not just a Norway artifact. Judging by the graph, it can be reasonably assumed that Norway was driving the global result.

### Sensitivity Check — Is Norway driving the global slope?

In order to verify this, the global regression is run without Norway and the slope and significance is compared to the baseline model. The results are presented in table 6.1 below.

Model	Sample	$\beta$ (Slope)	SE	t	p	R <sup>2</sup> (Adj.)	Interpretation
(1)	All countries (with Norway)	1.57*	0.19	8.43	< .001	.22	Positive and significant. Across all countries, higher fiscal balances are associated with higher debt levels—largely due to Norway’s outlier status.
(2)	All countries (excluding Norway)	−4.78*	0.39	−12.37	< .001	.45	Strong, significant negative relationship. Once Norway is excluded, the expected pattern appears: stronger fiscal balances correspond to lower debt.
(3)	Suriname only	−0.48	1.43	−0.34	.74	.00	Negative but statistically insignificant. The expected direction holds, but the effect is weak, likely reflecting data volatility and country-specific shocks.

Table 6.1: Summary model regression.

### Interpretation

1. All countries (with Norway). The positive slope ( $\beta = 1.57$ ,  $p < .001$ ) indicates that, across the full sample, higher fiscal balances are correlated with higher debt. This counterintuitive result arises primarily from Norway, which runs large fiscal surpluses due to oil revenues but continues to issue debt as a safe asset and for liquidity management. These practices reflect accounting conventions, where gross debt is recorded separately from sovereign wealth assets, giving the appearance of high debt despite strong fiscal positions.

### 2. Excluding Norway

When Norway is removed, the slope turns negative ( $\beta = -4.78$ ,  $p < .001$ )—consistent with the textbook expectation that fiscal improvement (smaller deficits or surpluses) reduces debt levels. This demonstrates that the global positive slope was a composition effect, not a general pattern.

### 3. Suriname only

For Suriname, the slope is negative ( $\beta = -0.48$ ) but not statistically significant ( $p = .74$ ). The relationship moves in the expected direction, yet annual data may obscure the effect due to volatility, structural shocks, or external financing cycles.

### 4. Overall conclusion

The positive global slope is a cross-country artifact dominated by Norway’s unique fiscal structure. Excluding Norway reveals the expected negative relationship between fiscal balance and debt. Suriname’s pattern aligns with that logic, though statistically weaker, suggesting fiscal policy’s effect on debt is present but overshadowed by other dynamics.

## 6.4 Extending the model with controls

In this subsection, the model will be extended with controls to see if the negative slope (more fiscal deficit leading to higher debt) remains significant once other drivers are accounted for. The baseline model (debt on fiscal balance) showed a negative slope once Norway was removed. But it could be misleading if other factors drive both debt and fiscal balances (confounding).

Typical macroeconomic controls that might influence debt dynamics:

- **GDP growth:** faster growth can reduce debt ratios.
- **Inflation:** higher inflation erodes the real value of debt.
- **Natural resource rents:** for countries like Suriname, resource revenue shocks matter a lot.

By adding GDP growth, inflation, and resource rents, it can be tested whether the fiscal balance effect remains robust or disappears once accounted for economic fundamentals. The results are presented in table 6.2. The reader is referred to the technical report for the full table.

Model	Included Controls	$\beta$ (Fiscal Balance)	SE	t	p	Adj. R <sup>2</sup>	Interpretation
(1)	None (baseline, no Norway)	-4.78*	0.39	-12.37	< .001	.45	Strong negative link: when fiscal balances improve (deficits shrink), debt falls. Baseline model without macro controls.
(2)	GDP Growth	-1.83*	0.43	-4.26	< .001	.65	Still negative but weaker: growth explains part of the debt–balance link. Debt also rises slightly with higher growth ( $\beta = +0.13^{***}$ ).
(3)	Inflation	-4.37*	0.32	-13.49	< .001	.62	Similar magnitude to baseline. Inflation strongly raises debt ( $\beta = +0.57^{***}$ ), suggesting nominal instability adds fiscal strain.
(4)	Resource Rents	-3.50*	0.24	-14.44	< .001	.62	Fiscal balance effect remains robust. Resource rents weakly reduce debt ( $\beta = -0.40$ , $p \approx .06$ ), consistent with resource windfalls easing debt pressures.
(5)	All Controls (growth, inflation, rents)	-2.21*	0.33	-6.67	< .001	.72	Fiscal balance remains significantly negative, even after controlling for all factors. Growth and inflation increase debt; resource rents reduce it slightly but insignificantly.

Table 6.2: Summary model regression with controls.

## Interpretation

### Baseline model (no controls)

Without Norway, the relationship between fiscal balance and debt is strongly negative ( $\beta = -4.78$ ,  $p < .001$ ) — the expected textbook pattern: improving fiscal balances are associated with lower debt ratios. Countries that run higher surpluses (or smaller deficits) tend to have lower debt ratios, even after controlling for growth, inflation, and resource rents.

This aligns with economic intuition: better fiscal discipline reduces reliance on borrowing. This model explains roughly 45% of within-country variation.

### Controlling for GDP growth

Adding growth reduces the fiscal balance coefficient ( $-1.83$ ), meaning part of the debt–balance link operates through the business cycle. Periods of stronger growth both improve balances and reduce debt accumulation, but growth itself slightly raises debt ( $\beta = +0.13^{***}$ ), possibly reflecting procyclical borrowing or investment during booms. A country growing faster usually finds it easier to stabilize debt.

### Controlling for inflation

When inflation is added, the fiscal balance effect remains strong ( $-4.37^{***}$ ), while inflation is positively associated with debt ( $\beta = +0.57^*$ ) \*\*. The positive and highly significant inflation coefficient ( $p < .001$ ) indicates that periods of higher inflation are typically associated with increases in government debt. This reflects that inflation often arises during episodes of fiscal stress—when governments finance deficits through borrowing or monetary expansion. Rather than eroding debt, inflation in these contexts signals macroeconomic instability: higher interest rates, rising debt-servicing costs, and weaker fiscal credibility combine to push debt upward alongside prices.

### Controlling for resource rents

Adding resource rents shows that countries earning higher natural resource rents tend to have slightly lower debt ( $\beta = -0.40$ ,  $p \approx .06^*$ ). The negative (though only marginally significant) coefficient on resource rents suggests that higher natural resource revenues are generally associated with lower government debt. This pattern reflects that resource windfalls can temporarily strengthen fiscal balances and reduce borrowing needs. However, the weak statistical significance implies that this effect is not consistent across countries or years—likely because resource revenues are volatile and often accompanied by higher spending, which can offset their debt-reducing potential.

### Full model with all controls

When all variables are included, the fiscal balance coefficient remains strongly negative ( $-2.21$ ,  $p < .001$ ), confirming that fiscal discipline robustly lowers debt even after accounting for growth, inflation, and resource rents.

1. Growth ( $\beta = +0.12$ ) and inflation ( $\beta = +0.35$ ) both increase debt, possibly reflecting that governments borrow more during booms or inflationary instability.
2. Resource rents ( $\beta = -0.26$ ) have the expected negative sign, though not statistically significant.
3. The model explains about 72% of within-country debt variation, indicating a good overall fit.

## Summary Insight

Across all specifications, the negative link between fiscal balance and debt remains statistically robust. Controlling for macroeconomic factors like growth, inflation, and resource rents reduces the magnitude but not the significance of the effect. This confirms that fiscal stance is the key driver of debt dynamics, while growth and inflation primarily act as reinforcing or amplifying mechanisms rather than substitutes for fiscal adjustment.

### 6.4.1 Extending the model for Suriname only with controls

Next step would be to compare Suriname's regression results (OLS with controls) to these global coefficients, that way, it can be tested to what extent Suriname differs. Note the equation is used to represent the within-country (fixed-effects) specification used to estimate the effect of fiscal balance, GDP growth, inflation, and resource rents on government debt (% of GDP). The coefficients are denoted with  $\beta$  and the error term with  $\varepsilon_t$  in the formula below.

$$\text{Debt}_t = \beta_0 + \beta_1 \text{Balance}_t + \beta_2 \text{Growth}_t + \beta_3 \text{Inflation}_t + \beta_4 \text{Rents}_t + \varepsilon_t$$

The results are summarised in the table 6.3 below.

Model	Sample	$\beta$ (Fiscal Balance)	$\beta$ (Growth)	$\beta$ (Inflation)	$\beta$ (Resource Rents)	Adj. R <sup>2</sup>	Interpretation
(1)	Global (5-country panel)	-2.21*	+0.12**	+0.35***	-0.26	.72	Debt decreases with stronger fiscal balances, but rises with higher growth and inflation. Resource rents slightly reduce debt, though insignificantly.
(2)	Suriname	-2.48 **	-1.24*	+0.39***	+0.07	.81	Fiscal balance still reduces debt, but growth now lowers it (opposite to global). Inflation again raises debt sharply; resource rents have no discernible effect.

Table 6.3: Summary model regression.

### Fiscal balance effect

In both the global and Suriname models, the fiscal balance coefficient is negative and statistically significant, meaning that improved fiscal positions (smaller deficits or larger surpluses) are associated with lower debt ratios.

- Globally:  $\beta = -2.21$  ( $p < .001$ )
- Suriname:  $\beta = -2.48$  ( $p = .0013$ )

The magnitude is almost identical, suggesting that Suriname's debt responds to fiscal adjustment much like the global average, confirming a strong "textbook" debt-deficit link.

## GDP growth

Here the **direction reverses**:

- Globally, growth was **positively associated with debt** ( $\beta = +0.12$ ) — indicating that globally, higher growth is associated with rising debt, suggesting that governments often borrow more during economic upswings rather than using growth periods to reduce debt.
- In Suriname, growth significantly reduces debt ( $\beta = -1.24$ ,  $p = .032$ ), likely because periods of rapid expansion boost government revenues — particularly from exports — allowing the country to repay debt or reduce new borrowing needs.

## Inflation

Both models show **a strong positive and highly significant relationship** between inflation and debt:

- Globally:  $\beta = +0.35$  ( $p < .001$ )
- Suriname:  $\beta = +0.39$  ( $p < .001$ ) Inflation is positively and significantly associated with debt, both globally and in Suriname. Although inflation can, in theory, reduce the real value of outstanding debt, in practice it tends to coincide with periods of fiscal stress and macroeconomic instability. Rising prices often reflect or exacerbate fiscal imbalances — through higher interest costs, exchange-rate depreciation, and increased debt-servicing needs. The positive coefficient therefore indicates that inflation and debt typically move together, not because inflation causes borrowing, but because both emerge from the same underlying fiscal pressures, such as persistent budget deficits, monetary financing of government spending, and rising interest or exchange-rate costs.

## Resource rents

Resource rents have **opposite but weak effects**.

- Globally, slightly negative ( $\beta = -0.26$ , ns).
- In Suriname, slightly positive ( $\beta = +0.07$ , ns). The coefficient on resource rents is small and statistically insignificant in both the global and Suriname models, indicating that fluctuations in natural resource revenues have no consistent effect on government debt. Globally, resource rents are weakly associated with lower debt, reflecting that resource-rich countries can use windfalls to strengthen fiscal balances and reduce borrowing. In Suriname, however, the relationship is slightly positive, suggesting that resource income does not systematically translate into debt reduction. This likely reflects the volatility of resource revenues, procyclical fiscal spending, and limited saving mechanisms to channel windfalls toward debt repayment.

## Model fit

Suriname's model has a higher adjusted  $R^2$  (0.81) than the global one (0.72), meaning the variables explain a larger share of debt variation within Suriname. This reflects how closely debt movements in Suriname are tied to these macroeconomic indicators, particularly fiscal stance and inflation.

## Summary interpretation

Suriname's results broadly align with global patterns but reveal distinct national dynamics. Fiscal balance remains the strongest determinant of debt reduction, underscoring the importance of fiscal discipline. Economic growth, unlike in the global sample, helps Suriname lower its debt ratio, suggesting that growth periods are used to consolidate rather than expand borrowing. Inflation, however, sharply increases debt, highlighting Suriname's vulnerability to price instability and rising financing costs. Resource **rents** show no consistent debt-reducing effect, likely reflecting volatile revenues, limited fiscal buffers, and procyclical spending behaviour.

## References

Source	Reference
1. Chile — Structural Balance Rule	Marcel, M. (2013, July). <i>The Structural Balance Rule in Chile: Ten Years, Ten Lessons</i> . Inter-American Development Bank. <a href="http://dx.doi.org/10.18235/0006959">http://dx.doi.org/10.18235/0006959</a>
2. Norway — Bird-in-Hand Stabilization Fund	Harding, T., & van der Ploeg, F. (2009). <i>Is Norway's Bird-in-Hand Stabilization Fund Prudent Enough? Fiscal Reactions to Hydrocarbon Windfalls and Graying Populations</i> (CESifo Working Paper No. 2830). CESifo. Retrieved November 1, 2025, from <a href="https://ideas.repec.org/p/ces/ceswps/_2830.html">https://ideas.repec.org/p/ces/ceswps/_2830.html</a>
3. Ghana — Petroleum Revenue Management Act	Ministry of Finance. (n.d.). <i>Petroleum Revenue Management Act 815</i> . Ghana Ministry of Finance. Retrieved November 1, 2025, from <a href="https://www.mofcp.gov.gh/publications/acts-and-policies/petroleum-revenue-management-act-815">https://www.mofcp.gov.gh/publications/acts-and-policies/petroleum-revenue-management-act-815</a>
4. World Bank – Suriname country data (GDP, GDP pc, CPI, FX, etc.)	World Bank. (n.d.). <i>Suriname</i> . World Bank Open Data. Retrieved November 1, 2025, from <a href="https://data.worldbank.org/country/suriname">https://data.worldbank.org/country/suriname</a>
5. IMF / World Bank / Suriname budget documents — fiscal indicators	Government of Suriname; International Monetary Fund; World Bank. (n.d.). <i>Fiscal indicators and budget documentation for Suriname</i> [Various reports]. Retrieved November 1, 2025, from <a href="https://share.google/W8wuiAZfHsYWPanc5">https://share.google/W8wuiAZfHsYWPanc5</a>
6. Exchange rate & CPI — World Bank / Central Bank	World Bank. (n.d.). <i>Prices &amp; exchange rate indicators for Suriname</i> . World Bank Open Data. Retrieved November 1, 2025, from <a href="https://data.worldbank.org/country/suriname">https://data.worldbank.org/country/suriname</a> Central Bank of Suriname. (n.d.). <i>Official statistics (exchange rate, CPI)</i> . Retrieved November 1, 2025, from <a href="https://www.cbvs.sr">https://www.cbvs.sr</a>



**Completion Notice**

Additional content is under construction and will be included in the final version of the report. This material is confidential and reserved for authorized review only.