

PRACTICE PROJECT · MACROECONOMICS & FINANCE

Growth and Stability of the Banking Sector of Bangladesh

What do the macroeconomic indicators say?

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1. Executive Summary

This documentation presents an analysis of the economic actions and performance of the banking sector of Bangladesh, and their correlation with the country's broader economic performance as reflected in macroeconomic indicators. Data was sourced from **World Bank**, **IMF-Financial Soundness Indicators (FSI)**, and **Kaggle** (compiled macroeconomic dataset). Key indicators were:

- GDP per capita
- Inflation of Consumer Prices
- Total Investment
- Broad Money of GDP
- Domestic Credit to Private Sectors of GDP
- Total Loans
- Loans to Domestic Economy
- Deposits to Loan Percentage
- Non-performing Loans Percentage

The analysis finds that while macroeconomic indicators reflect genuine growth over the period, banking sector performance reveals deeper structural vulnerabilities that constrained that growth's full potential.

2. Purpose of This Project

This was undertaken as the second practice exercise data science project. The scope of practice was:

- Using **PostgreSQL** (DDL, DML, DCL, TCL) for real world situations: creating a database locally, connecting to it using Terminal/Shell, managing it, loading data, doing analytical queries, and bringing out results in an applicable format.
- Doing a project with **bigger datasets** from **multiple sources** and distinct data files.
- Doing a **Finance** focused project, essentially Finance of Bangladesh.

3. Methodology

```
├─ data_clean
├─ data_raw
├─ documentation
├─ results
│   └─ Plots
├─ scripts
└─ sql
```

3.1. Data Extraction

All data were downloaded manually from respective sources. The downloaded raw data were stored in the [data_raw](#) directory. The data ranges from minimum 1980 to maximum 2024.

- [BD_economic_indicators.csv](#) — **Kaggle** macroeconomic indicators of Bangladesh.

- [world_bank1.csv](#) and [world_bank2.csv](#) — **World Bank** macroeconomic and banking indicators.
- [IMF-FSI-A.BD.FSGDLD_XDC.csv](#) — total loans in millions.
- [IMF-FSI-A.BD.FSKNL_PT.csv](#) — net non-performing loans in percentage.
- [IMF-FSI-A.BD.FSANL_PT.csv](#) — non-performing loans of total loans in percentage.
- [IMF-FSI-A.BD.FSCD_PT.csv](#) — customer deposits to total loans in percentage.

3.2. Cleaning Data

Raw data were cleaned using Python scripts in the [scripts](#) directory and saved in the [data_clean](#) directory.

- [BD_macroeconomic_clean.py](#), [world_bank1_clean.py](#), [world_bank2_clean.py](#), [GDLD_imf_clean.py](#), [KNL_imf_clean.py](#), [ANL_imf_clean.py](#), [CD_imf_clean.py](#) — script names correspond directly to the files they process.
- [clean_duplicate_values.py](#) and [clean_partition_sqlMacroData.py](#) cleaned intermediate dataframes.
- [recalculate_change.py](#) and [reshape_change.py](#) modified dataframes for final SQL loading.

3.3. SQL

PostgreSQL was used for creating the database, schema, performing test analysis, saving data tables, and exporting shaped tables for visualization. In the [sql](#) directory:

- [schema.sql](#) defined tables: `dim_time`, `dim_indicator`, `dim_source`, `fact_macro`, `fact_banking`.
- [load_macro.sql](#), [load_fsi.sql](#), [load_wb.sql](#) — loaded cleaned data from `data_clean`.
- [views.sql](#) defined joined views to simplify analysis.

The analytical queries were done in interactive terminal sessions and the necessary ones saved as CSV extracts for visualization in the [results](#) directory.

4. Macroeconomic Overview

The macroeconomic environment in Bangladesh throughout the observation period shows a developing economy juggling fiscal restraints, inflationary cycles, and growth demands.

4.1. Economic Growth

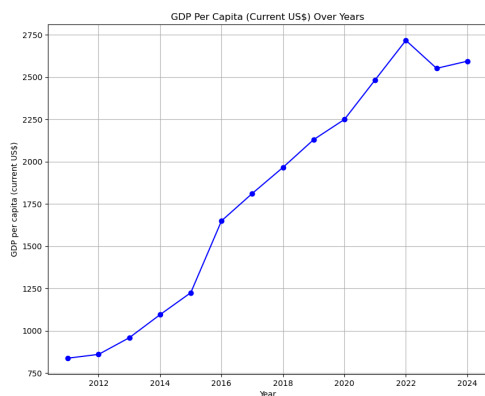


Figure 1: GDP per Capita

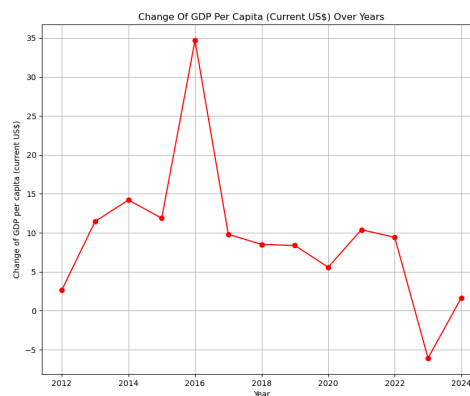


Figure 2: Change in GDP per Capita

Bangladesh’s GDP per capita grew remarkably for around eleven years, then beginning in 2022 it started to decline. The rate-of-change data supports this — growth peaked in 2015 before pulling back in 2016, slowed again in 2022, and recovered to more stable levels by 2023.

4.2. Investment & Employment

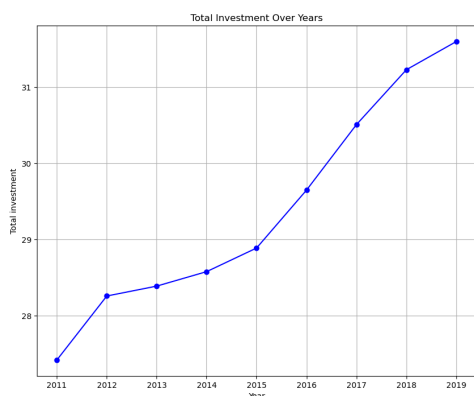


Figure 3: Total Investment

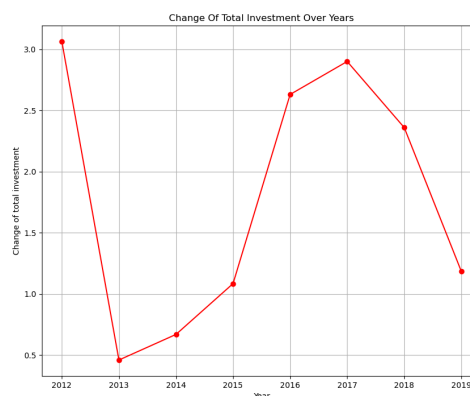


Figure 4: Change in Total Investment

Over the course of the study, total investment steadily increased — a positive signal for the nation’s long-term socioeconomic development.

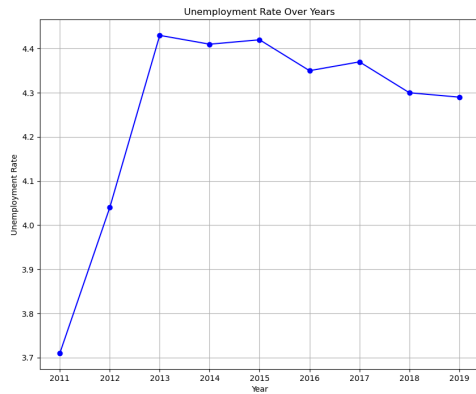


Figure 5: Unemployment Rate

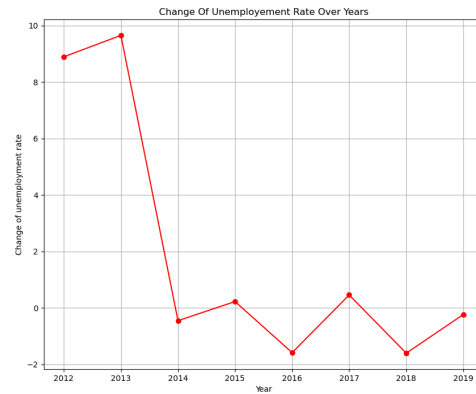


Figure 6: Change in Unemployment Rate

2011 saw a significant rise in unemployment despite a period of general economic expansion — a reminder that aggregate growth does not always translate immediately into job creation. By 2013, the rate had been brought to stable levels.

5. Price & Monetary Environment

5.1. Inflation

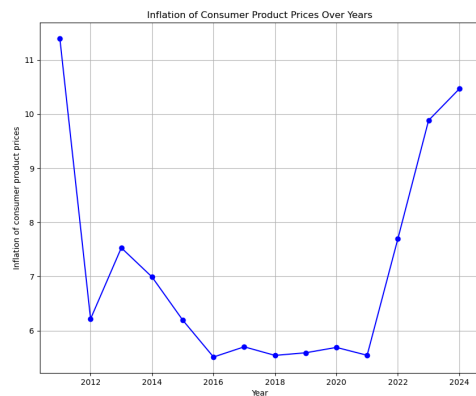


Figure 7: Inflation — Consumer Prices



Figure 8: Change in Inflation — Consumer Prices

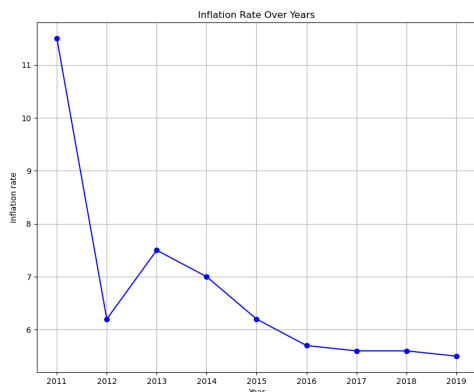


Figure 9: Inflation Rate

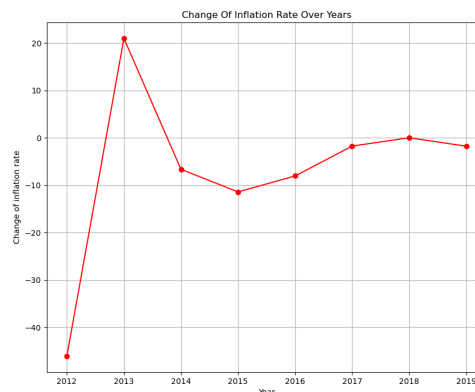


Figure 10: Change in Inflation Rate

2011 proved to be an inflection point for price stability: inflation fell to nearly half its prior level and held there for close to eight years. From 2019 onwards, however, **a steep reversal brought inflation back toward earlier highs** — a trend that has yet to fully unwind.

5.2. Broad Money Supply



Figure 11: Broad Money of GDP

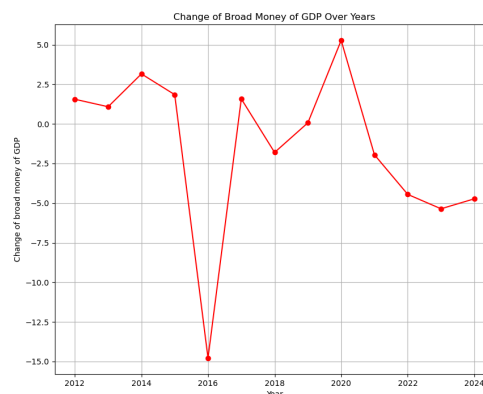


Figure 12: Change in Broad Money of GDP

Between 2011 and 2015, broad money as a percentage of GDP increased. The rate-of-change data presents a more sobering picture: over the majority of the period, money supply growth was negative relative to GDP, indicating that **monetary expansion was decelerating even as the broader economy grew**.

6. Fiscal Position

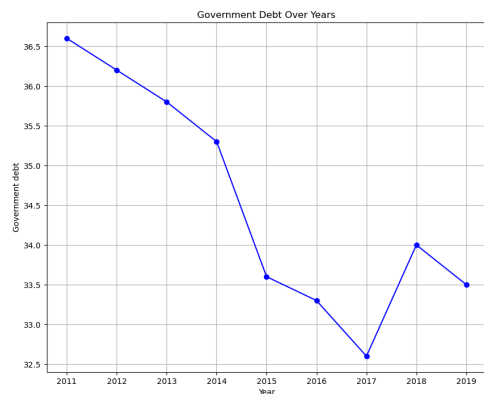


Figure 13: Government Debt

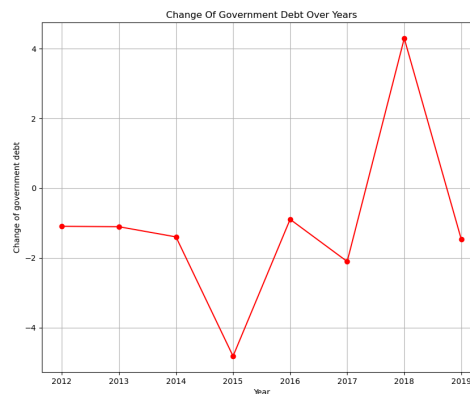


Figure 14: Change in Government Debt

Government debt declined as a whole across the studied period, suggesting fiscal prudence — though as explored in the synthesis section, the relationship between public borrowing and private credit access complicates this reading.

7. Banking Sector — Lending Activity

The credit intermediation data presents a mixed picture. While headline totals appear relatively stable, the composition and quality of credit shifted meaningfully — and not always in a healthy direction.

7.1. Total Loans

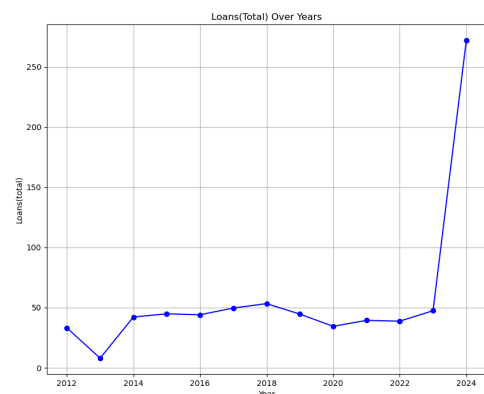


Figure 15: Total Loans

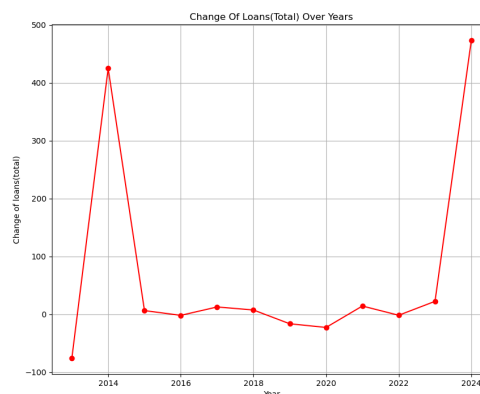


Figure 16: Change in Total Loans

Total loans held broadly steady in nominal terms, though the rate-of-change data reveals two sharp peaks in lending growth. **These bursts of credit expansion, absent a corresponding improvement in loan quality, are worth reading as early warning signals in hindsight.**

7.2. Domestic Credit to Private Sector

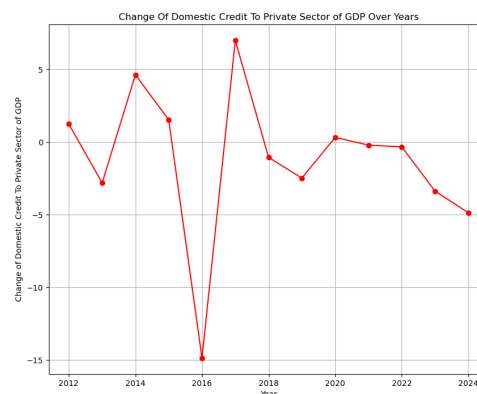
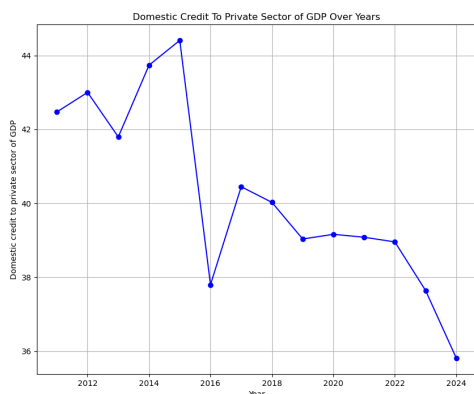


Figure 17: Domestic Credit to Private Sector

Figure 18: Change in Domestic Credit to Private Sector

Over the course of the study, the value of domestic credit flowing to the private sector decreased — a worrying trend for an economy where private enterprise is the primary driver of growth and employment.

8. Banking Sector — Health & Risk

8.1. Liquidity Position

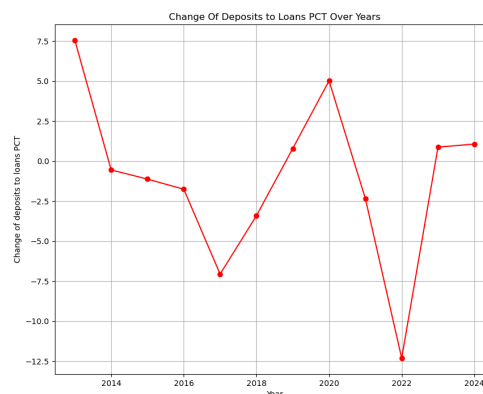


Figure 19: Deposits to Loans %

Figure 20: Change in Deposits to Loans %

The deposits-to-loans ratio declined consistently across the studied period. A falling ratio sustained over a decade indicates that loan books were growing faster than deposit funding — pointing to a structurally thinner liquidity cushion in the banking system.

8.2. Loan Quality

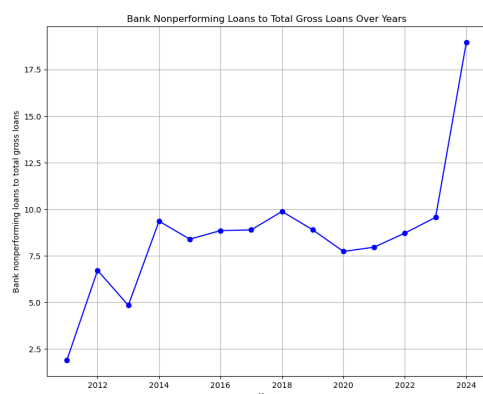


Figure 21: Non-Performing Loans

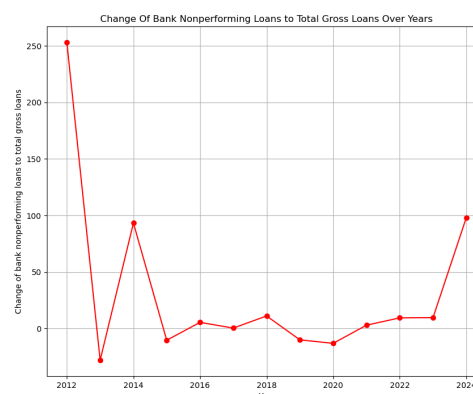


Figure 22: Change in Non-Performing Loans

The non-performing loans data is the most telling indicator in this section. **NPLs rose steadily across the period, with particularly sharp jumps in 2011 and 2024.** A banking system carrying an expanding stock of bad debt cannot efficiently recycle capital into productive lending.

9. Synthesis: Growth above the surface, tension underneath

9.1. Did economic slowdown drive the banking stress?

There is a clear lag in the relationship between GDP per capita growth and NPL accumulation. Around 2019–2020, growth began to slow down, and in the years that followed, non-performing loans accelerated — consistent with the typical one-to-two year transmission lag.

Engineered Banking Stress: The sharp NPL jump around 2024 likely reflects something more acute than a routine downturn: the compounding effect of political instability, capital flight, and a weakened state capacity to enforce credit discipline. **Bangladesh’s banking stress was not merely cyclical — it was structurally enabled.**

9.2. Credit Boom and Bust Cycle

Private sector credit expanded through the mid-2010s, broadly coinciding with the period of strong GDP growth and rising investment. This expansion, however, was not matched by improvements in underwriting discipline — as the subsequent steady rise in non-performing loans makes clear.

A contraction driven by stress, not strategy: The pullback in private credit from 2019 onwards may look like prudent tightening on a chart, but in context it reflects banks retreating due to deteriorating balance sheets. **A credit contraction driven by institutional stress constrains productive investment precisely when the economy needs it most.**

9.3. Monetary Expansion and Price Effects

Broad money growth broadly tracks the inflation trajectory with a short lag. The relative price stability between roughly 2012 and 2019 coincided with moderating monetary

expansion. The inflationary resurgence from 2019 onwards aligns with renewed monetary loosening, likely driven by government financing pressures and post-pandemic liquidity support.

Limited independence for Bangladesh Bank: The data points to a central bank with constrained operational independence when fiscal demands pull in the other direction.

9.4. Fiscal Pressure on the Banking Sector

Government debt as a share of GDP declined over the studied period, which appears fiscally responsible. However, the declining domestic credit to the private sector over the same window suggests **a possible crowding-out dynamic: as the government continued drawing on domestic financial markets, private borrowers faced tighter credit availability and higher effective borrowing costs.**

The private sector squeezed from both sides: Combined with rising NPLs — which erode bank capital and reduce the capacity to extend new credit — **the private sector found itself constrained from two directions simultaneously.** This helps explain why aggregate investment figures remained positive even as the credit environment for private enterprise quietly worsened.

10. Insights

Bangladesh's macroeconomic trajectory over the studied period (2011–2024) is, on balance, a story of genuine progress. GDP per capita grew steadily for over a decade, investment expanded, unemployment stabilised, and government debt declined. These are durable foundations that tend to produce growth even under unfavourable institutional conditions.

What is surprising — or perhaps not, given the history — is **how consistently the banking sector failed to convert that macroeconomic momentum into a healthy credit environment. Non-performing loans climbed steadily. Private credit contracted. The deposits-to-loans ratio deteriorated.** These sit at the centre of how a developing economy translates aggregate growth into broad-based opportunity. When the banking sector underperforms, it acts as a ceiling on what the macroeconomic fundamentals can actually deliver.

10.1. A Country Shaped by Its Own History

Bangladesh is a young country in the most literal sense. It emerged from a devastating liberation war in 1971 with barely half a decade to rebuild its institutions before the pressures of governance took hold. Political instability has been a near-constant feature of Bangladesh's post-independence history, and the period studied here is no exception.

The non-performing loans trajectory does not just reflect economic cycles. **It reflects governance failure.**

The student-led uprising and subsequent overthrow of the incumbent government — which had held power across much of this study's timeframe — was the surface expression of years of accumulated institutional decay: corruption embedded in state structures, money

channelled through politically connected enterprises, and a banking system that functioned, at least in part, as an instrument of patronage rather than credit intermediation.

10.2. Where This Leaves Bangladesh

An economy that grows despite its institutions rather than because of them is an economy leaving a significant portion of its potential unrealised. The gap between what the macroeconomic indicators suggested and what banking sector performance actually delivered is precisely the size of that institutional drag.

The path forward is not complicated to describe, even if genuinely difficult to execute: transparent institutions, accountable governance, and a banking system that allocates credit on the basis of economic merit rather than political proximity.

What comes next depends on whether the institutional failures documented here are treated as the emergency they are.

11. Author's Note

This was an exercise project designed to move to a bigger project (larger datasets, diverging fields, more functional complexity) and to practice the practical use of SQL-RDBMS on local systems for data manipulation and database handling.

The reader is asked not to view this work under the same lens as impactful data science research respected by the community. The practice grows progressively into more real-world application-oriented ideas and toolings. Check out the [PracticeProjects](#) repo for the full progression. Other original research ideas and interesting projects are currently under development.