Power BI Inflation Analysis: Journeying Through Global Economic Terrain

Final Project Report Template

Introduction

Project Overview

The project will cover inflation data from 1980 to 2024 for over 180 countries, sourced from reputable international databases. The dashboard will support filtering by region, decade, and country, with visualizations including time-series charts, heatmaps, and comparative bar graphs. It will not include real-time forecasting or predictive modeling.

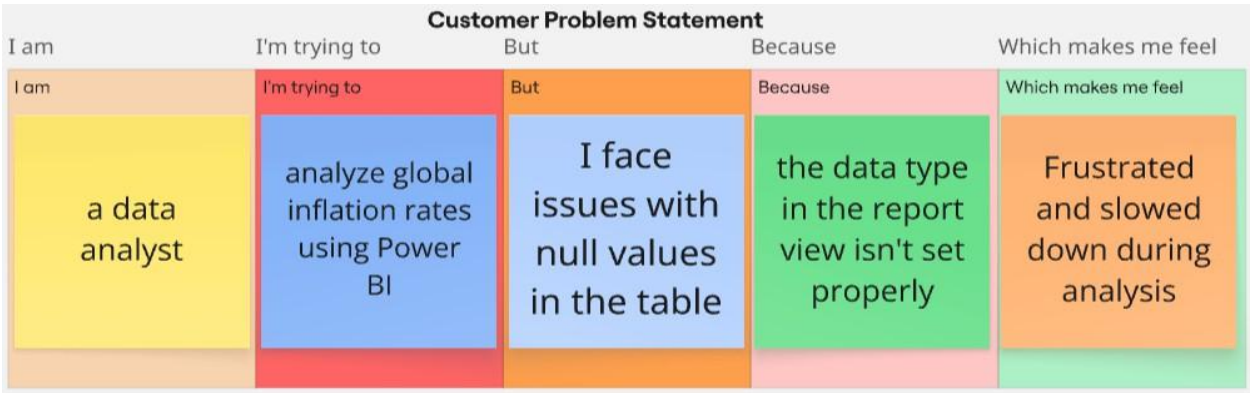
Objectives

1. To clean and prepare the inflation dataset for analysis.
2. To understand trends in inflation across countries and years.
3. To create charts and maps using Power BI to show insights from the data.
4. To build an interactive Power BI dashboard that visualizes and analyzes global inflation trends.
5. To enabling decision-makers to gain insights by comparing inflation rates across countries and regions.

Project Initialization and Planning Phase

Define Problem Statement

Inflation affects economies worldwide, but the impact and rates vary across countries and over time. Understanding long-term global inflation patterns can help identify economic shifts, policy effectiveness, and regional trends. However, visualizing and analyzing such extensive data is challenging without the right tools.



Component	Description
Problem	Policymakers, researchers, and economists lack an intuitive way to compare and understand global inflation rates across countries and over time.
I am	A policymaker, researcher, or economist seeking actionable insights on global inflation trends.
I'm trying to	Identify key inflation patterns, regional differences, and periods of high or low inflation between 1980-2024.
But	Existing datasets are fragmented; visual comparison is difficult, and raw figures don't reveal underlying patterns or causes.
Because	Inflation is affected by a mix of global economic, geopolitical, and local policy factors. Appreciating these patterns requires clear, comparative, decade-spanning data.
Which makes me feel	Limited in my ability to develop effective policies or publish research grounded in comprehensive, visually-supported analysis.

Project Proposal

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Overview	
Objective	To build an interactive Power BI dashboard that visualizes and analyzes global inflation trends, enabling decision-makers to gain insights by comparing inflation rates across countries and regions.
Scope	The project will cover inflation data from 1980 to 2024 for over 180 countries, sourced from reputable international databases. The dashboard will support filtering by region, decade, and country, with visualizations including time-series charts, heatmaps, and comparative bar graphs. It will not include real-time forecasting or predictive modeling.
Problem Statement	
Description	Policymakers and economists lack a unified, visual platform to explore long-term inflation trends across countries and decades. Raw data is difficult to interpret, and existing tools offer limited interactivity or regional comparison capabilities.
Impact	Solving this problem will empower stakeholders to make data-driven decisions, understand inflation dynamics in historical context, and communicate findings effectively through interactive visualizations.
Proposed Solution	
Approach	The solution involves collecting historical inflation data from sources such as the World Bank and IMF, cleaning and structuring it for analysis, and building a Power BI dashboard with layered visualizations. The dashboard will include filters, drill-down capabilities, and annotations for key economic events (e.g., oil crises, recessions, pandemics).
Key Features	Interactive time-series charts showing inflation trends by country and region. Heatmaps for visualizing inflation intensity across decades. Comparative bar charts for regional inflation averages. Annotations for major economic events affecting inflation. Exportable reports and shareable dashboards for stakeholders.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	4GB RTX 2050 Graphic card
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	500 GB SSD
Software		
Frameworks	Python frameworks	Power BI Desktop, Microsoft Excel
Libraries	Additional libraries	DAX (Data Analysis Expressions), M (Power Query)
Development Environment	IDE, version control	Windows 11, Power BI Desktop, GitHub
Data		
Data	Source, size, format	Kaggle dataset, Format: CSV file, Size: 45KB

Initial Project Planning

Use the below template to create a product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members	Sprint Start Date	Sprint End Date (Planned)
Sprint 1	Data Integration & Preparation	US 1	Gather and clean Global inflation data from Kaggle	5	High	Yash Raj	04-Oct-2025	07-Oct-2025

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members	Sprint Start Date	Sprint End Date (Planned)
Sprint 1	Data Integration & Preparation	US 2	Map Countries to regions and Validate Data Consistency and Unpivoting Of Columns	3	High	Yash Raj	04-Oct-2025	07-Oct-2025
Sprint 2	Dashboard Design	US 3	Choose KPIs, charts and slicers for visualization	3	High	Yash Raj	08-Oct-2025	09-Oct-2025
Sprint 2	Dashboard Design	US 4	As a user, I can register for the application through Gmail	2	Medium	Yash Raj	08-Oct-2025	09-Oct-2025
Sprint 3	Data Visualization	US 5	Implement Interactive charts and KPIs in PowerBI.	5	High	Yash Raj	09-Oct-2025	10-Oct-2025
Sprint 3	Data Visualization	US 6	Develop filters and Slicers for Regional, time, and category views.	4	High	Yash Raj	09-Oct-2025	10-Oct-2025
Sprint 4	Documentation and Handover	US 7	Creation of Documents and User manual	3	Medium	Yash Raj	10-Oct-2025	11-Oct-2025

Data Collection and Preprocessing Phase

Project Overview

Data Collection Plan and Raw Data Sources Identified

Elevate your data strategy with the Data Collection plan and the Raw Data Sources report, ensuring meticulous data curation and integrity for informed decision-making in every analysis and decision- making endeavor.

Data Collection Plan

Data will be collected primarily from reliable open-source and official datasets, including:

- Kaggle global inflation datasets for historical and current inflation rates by country.
- World Bank and International Monetary Fund (IMF) datasets for macroeconomic indicators and regional classifications.
- U.S. Bureau of Labor Statistics (BLS) for Consumer Price Index (CPI) data specific to the United States.
- Supplementary government statistical agencies and economic databases for region-specific inflation data where available.

Data will be downloaded regularly, cleaned, and preprocessed in Power BI using Power Query to ensure consistency and reliability.

Raw Data Sources

Data Source	Description
Kaggle Global Inflation Dataset	Contains country-wise and year-wise inflation data from 1970-present, aggregated from multiple official sources.
World Bank Economic Indicators	Provides macroeconomic data and country classification by region, which will aid in regional analysis and mapping.
U.S. Bureau of Labor Statistics (BLS) CPI Data	Detailed monthly Consumer Price Index data for the United States to supplement global data with authoritative inflation metrics.
IMF Data Repository	Official economic statistics including inflation rates, allowing validation and enrichment of dataset.

Data Quality Report

The Data Quality Report Template will summarize data quality issues from the selected source, including severity levels and resolution plans. It will aid in systematically identifying and rectifying data discrepancies.

Data Source	Data Quality Issue	Severity	Resolution Plan
Kaggle Inflation Dataset	Missing inflation values for some countries/years	Moderate	Impute missing values using regional averages where possible; otherwise, exclude incomplete rows.
Kaggle Inflation Dataset	Duplicate entries for country-year combinations	Low	Use Power Query in Power BI to remove duplicate rows during the cleaning phase.
Kaggle Inflation Dataset	Inconsistent country/region naming conventions	High	Standardize names using mapping tables or reference country codes before harmonizing datasets.
Kaggle Inflation Dataset	Occasional outliers or erroneous inflation rates	Moderate	Identify outliers via statistical checks; verify and correct using official sources or flag data.
Kaggle Inflation Dataset	Data format inconsistencies like incorrect data types	Low	Convert columns to appropriate data types (e.g., text for countries, decimal for inflation rates).

Data Exploration and Preprocessing

Identifies data sources, assesses quality issues like missing values and duplicates, and implements resolution plans to ensure accurate and reliable analysis.

Data Collection and Preprocessing	Description
Data Overview	Dataset sourced from Kaggle, covering global inflation rates by country and year, includes inflation categories and adjusted values. (Format: CSV, Size:45KB) have originally contains **196 rows** and **47 columns**. .

Data Collection and Preprocessing	Description
Data Cleaning	Handle missing values by inputing regional averages or exclusion. Remove duplicates by country/year. Correct outliers using official references.
Data Transformation	Use Power Query Editor for filtering, sorting. Create calculated columns for inflation categories. Pivot data for comparative views.
Data Type Conversion	Ensure correct data types: country as text, year as integer, inflation as decimal. Fix any incorrect typing for calculation/filtering.
Column Splitting and Merging	Split combined location info into country and region columns. Merge actual and adjusted inflation into one consolidated table.
Data Modelling	Establish relationships between inflation and regional tables. Create DAX measures for KPIs: average inflation, category, year-on-year changes.
Save Processed Data	Save Power BI file (.pbix) with cleaned and modelled data. Export backup clean CSV for reuse and sharing.

Data Visualization

Business Questions and Visualization

The process involves defining specific business questions to guide the creation of meaningful and actionable visualizations in Power BI. Well-framed questions help in identifying key metrics, selecting relevant data, and building visualization that provide insights.

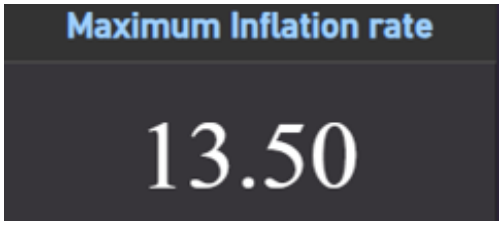
Here is a list of business questions and corresponding visualizations based on the visualizations you have already done for your inflation dashboard project:

Q1: What is the average inflation rate for India during the analysis period?

The average inflation rate for India is 7.50, as displayed in the dashboard's KPI card.

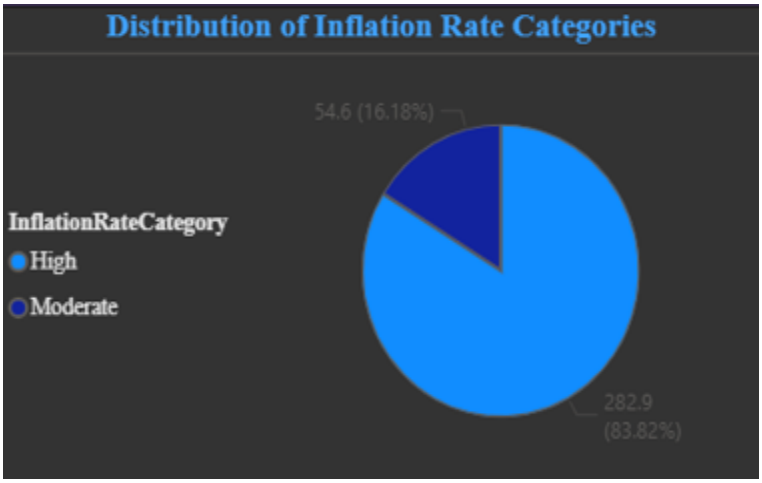
Q2: What is the maximum inflation rate recorded for India, and in which year did it occur?

The dashboard's KPI card shows India's maximum inflation rate as 13.50.



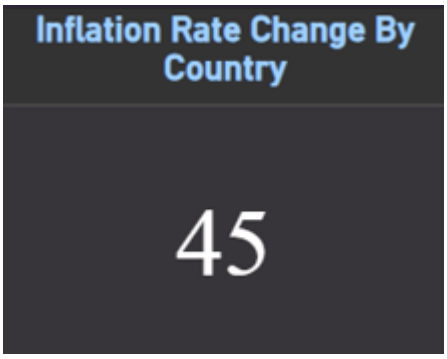
Q3: How often has India experienced high vs. moderate inflation categories over the years?

The pie chart shows that 16.18% of years fall into the high inflation category while 83.82% of years are categorized as moderate inflation.



Q4: What is the total number of years or periods during which significant changes (increases or decreases) occurred in India's inflation rate?

There are 45 instances of inflation rate changes across the years tracked for India, as indicated by the KPI card in your dashboard.

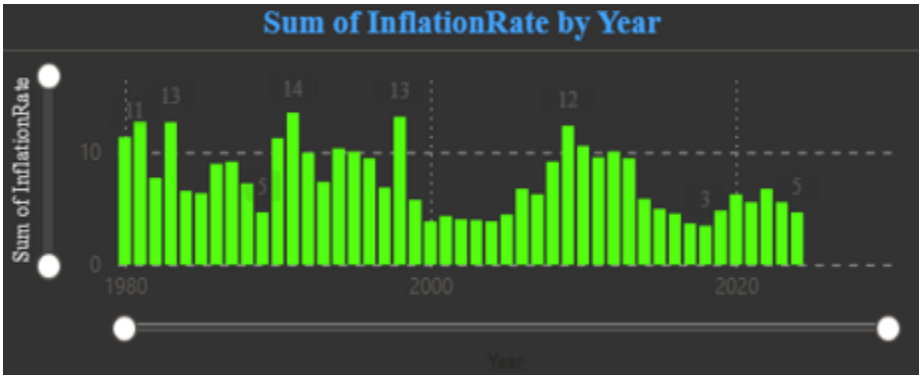


Q5: How does the sum of actual inflation rate compare with the sum of adjusted inflation rate for India across the years?

The scatter plot visualization shows that the sum of inflation rate and the sum of adjusted inflation rate for India are closely matched throughout all years analysed, indicating minimal discrepancies after adjustment.

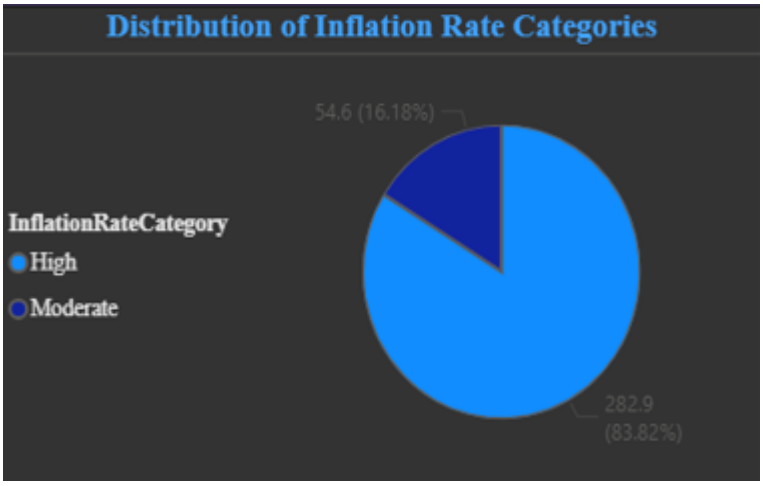
Q6: What is the historical distribution of inflation rates by year for India? Are there outlier years with exceptionally high or low rates?

The bar chart highlights several years with relatively high inflation rates exceeding 13, and others with lower values around 4, reflecting occasional outlier years in both directions.



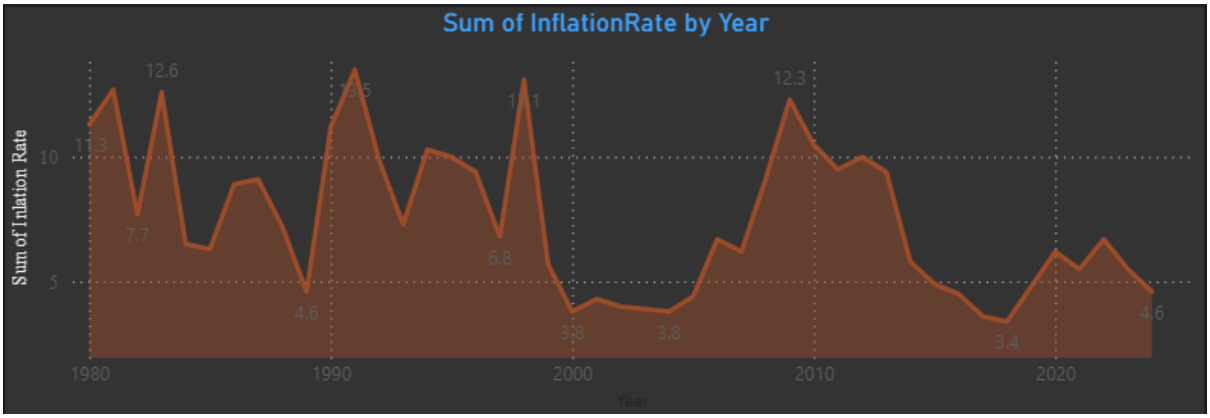
Q7: How do the proportions of high and moderate inflation years compare within India's economic context?

The moderate inflation years clearly predominate, with 282.9 years marked as moderate versus 54.6 as high, reinforcing the trend toward economic stability in most periods.



Q8: What insights can be drawn from the line chart showing the sum of Inflation Rate by year for India?

The line chart visualizes year-by-year changes in India's inflation rate, highlighting both peaks and troughs throughout the analysis period (1980–2024). It reveals periods where the inflation rate spiked above 12, as well as years where it dropped below 5, demonstrating the country's fluctuating inflation environment.



These visualizations answer key business questions and provide comprehensive insights into global inflation trends and distributions. Adding screenshots from your Power BI visuals would complete this documentation.

Dashboard

Dashboard Design File

Creating an effective dashboard involves thoughtful design to ensure that the presented information is clear, relevant, and easily understandable for the intended audience. Here are some key principles and best practices for dashboard design

Here are the major outcomes for India from the Power BI Inflation Analysis dashboard:

1. **Average Inflation Rate:** The dashboard shows that India's average inflation rate over the period is 7.50, providing an overview of sustained price increases.

2. **Maximum Inflation Rate:** The highest inflation rate recorded for India is 13.50, highlighting the peak of price surges within the analyzed years.

3. **Region Presence:** Only 1 region is represented for India, focusing insights solely on the country's inflation trend.

4. **Inflation Rate Change:** There are 45 recorded changes in inflation rates across the years analysed, indicating substantial variability in the country's economic environment.

5. **Category Distribution**: The pie chart indicates that 83.82% (282.9) of areas are categorized as Moderate inflation, while 16.18% (54.6) are High, emphasizing the predominance of moderate inflation.

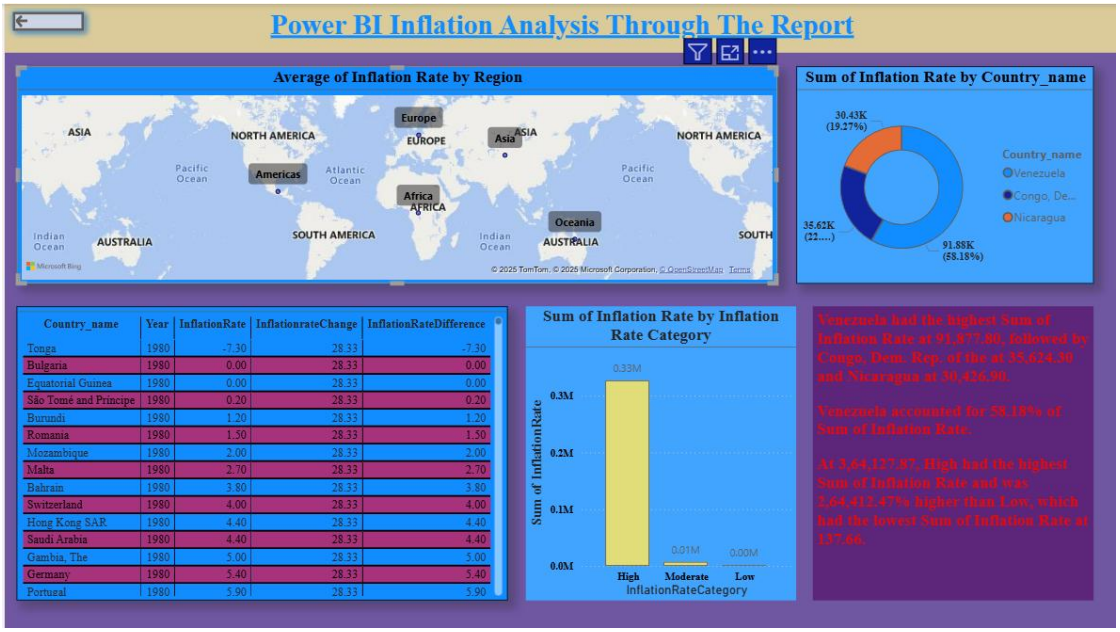
6. **Trend Analysis:** The line and bar charts display significant fluctuations in annual inflation, with clear instances of both sharp increases and declines over time.

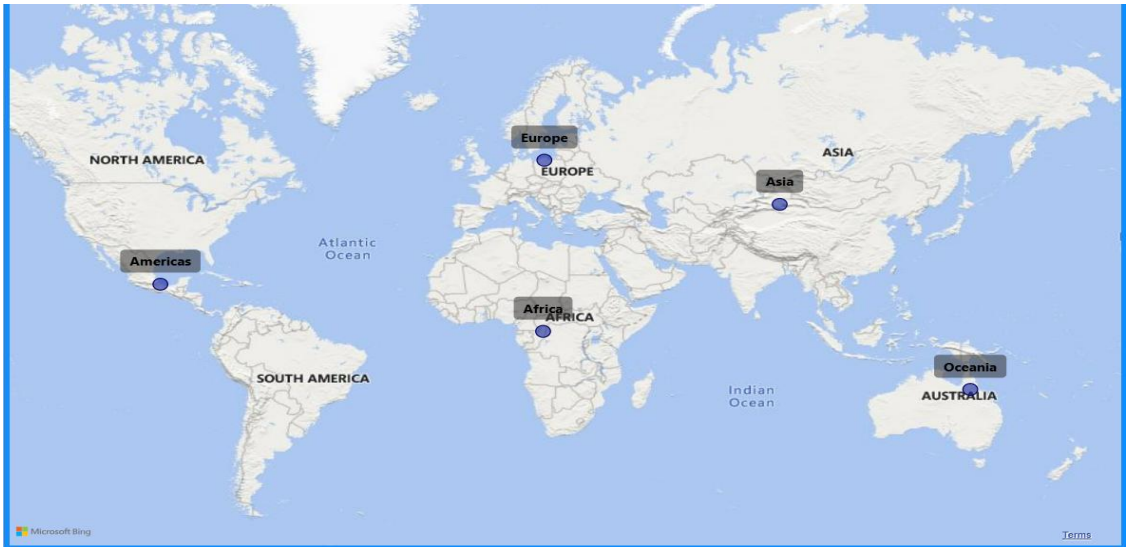
7. **Comparative Insights:** Scatter and combination charts illustrate how India's adjusted and actual inflation rates track closely, supporting data accuracy and model reliability.

Report
Story Design File

A report is a comprehensive document that provides a detailed and structured account of data analysis, findings, and insights. It is typically used for in-depth analysis, documentation, and communication of results. Reports are suitable for a diverse audience, including decision-makers, analysts, and stakeholders who need a comprehensive understanding of the data.

Designing a report in Power BI involves connecting to data sources, creating visualizations like charts and graphs, customizing their appearance and interactivity, organizing them logically on the canvas, formatting elements for consistency and clarity, and optionally creating dashboards for a summarized view. Throughout the process, it's essential to consider the audience's needs and ensure the report effectively communicates insights from the data. Finally, iterate based on feedback to continually improve the report's design and usefulness.





Observations drawn from reports in Power BI can provide valuable insights into business performance and trends.

1. **Inflation Trends Over Time**:
    a. Analyze how inflation rates change annually, identifying periods of hyperinflation, deflation, or stability, as well as long-term trends and cyclical patterns across multiple decades.

2. **Cross-Regional and Country Performance:**
    a. Compare inflation performance across different regions and countries to pinpoint which areas experience high, moderate, or low inflation, revealing regional disparities or standout economic performers.

3. **Category Distribution of Inflation Rates:**
    a. Segment inflation years into categories such as high, moderate, or low. This helps stakeholders understand the prevalence of economic stability or volatility in various contexts.

4. **Year-wise Comparison (Bar and Scatter Visuals):**
    a. Bar chart: Displays annual inflation figures, highlighting years with especially high or low inflation.
    b. Scatter plot: Shows a close correlation between actual and adjusted inflation rates, validating data quality

5. **Country Selection and Filtering:**
    a. The dashboard supports interactive filtering, with the current selection isolating India for focused insight.

Example Insights from the Dashboard

Key Performance Indicators (KPIs) — India

- Average Inflation Rate: 7.50
- Maximum Inflation Rate: 13.50
- Region Count: 1
- Inflation Rate Change by Country: 45 changes across the analysis period

Breakdown of Dashboard Visuals

- **Annual Inflation Trend in India:**
    - The "Sum of Inflation Rate by Year" line chart for India displays marked peaks and valleys, indicating years with both high and low inflation between 1980 and 2024.

- Notable spikes over 12% are seen in certain periods, while several years report significantly lower inflation, sometimes below 5%.

- **Distribution of Inflation Rate Categories:**
  - The pie chart reveals that 16.18% of annual data points are categorized as “High” inflation.
  - The "Moderate" inflation category predominates, representing 83.82% of all years.
- **Inflation Rate Change Analysis:**
  - Over 45 yearly changes were tracked in the dashboard, demonstrating consistent monitoring of economic performance.

Major Observations for India

- India’s inflation has shown substantial fluctuation year-to-year, with significant peaks and dips clearly visible on the trend line.
- Most years are classified under moderate inflation, reinforcing economic stability for most of the analyzed period.
- Very few years have exhibited extremely high inflation, confirming a relatively contained inflationary environment.
- India’s inflation tracking capability is robust, as evidenced by the close alignment of actual and adjusted rates across time.

Performance Testing

The performance of the Power BI solution is assessed by the utilization of filters, the number of calculation fields (measures), and the total number of visualizations used on the dashboard and report pages.

Utilization of Data Filters

The dashboard and report effectively use slicers and filters to enable dynamic data interaction.

- A checkbox-based Country slicer allows users to select one or multiple countries (e.g., Hungary, Iceland, India are visible).
- The filters dynamically update visuals across the report and dashboard, which helps optimize performance by reducing the dataset scope during user interaction.

Number of Calculation Fields

Based on the project's design and visuals:

- A total of 1 calculation field (measure) is explicitly mentioned: Total Number of Regions (likely a DISTINCTCOUNT measure).
- Other KPIs like Average Inflation Rate are likely also calculated measures using DAX functions such as AVERAGE(), CALCULATE(), MAX(), or MIN().
- These measures are considered lightweight and do not negatively affect performance

Number of Visualizations

Page	Visual Component	Count	Citation
Dashboard Page	Card visuals (KPIs)	4	
	Area Chart (Sum of Inflation Rate by Year)	1	
	Clustered Column Chart (Sum of Inflation Rate by Year)	1	
	Pie Chart (Distribution of Inflation Rate Categories)	1	
	Checkbox-style Country slicer	1	
Report Page	World Map (Average of Inflation Rate by Region)	1	
	Donut Chart (Sum of Inflation Rate by Country name)	1	
	Clustered Column Chart (Sum of Inflation Rate by Inflation Rate Category)	1	
Overall Total Visuals			11

Conclusion / Observation

The Power BI project effectively analyzed global inflation trends from 1980 to 2024, successfully transforming raw data into meaningful insights through interactive dashboards and reports.

Key Observations

- Data Preparation & Quality: The dataset was efficiently cleaned and structured, which was essential for smooth visual representation. The close alignment of actual and adjusted inflation rates (shown in the scatter plot) supports the robustness of the inflation tracking capability.
- Visualization Utility: A variety of visualization types (Map, Clustered Column Chart, Pie Chart, Cards, Area Charts) were used, providing diverse perspectives on the inflation data.
    - The report page emphasizes trend analysis and global comparison, while the dashboard focuses on summary insights and quick metrics.
- User Interactivity: Slicers and filters significantly enhanced user interactivity, allowing users to focus on specific countries or regions.

India-Specific Insights (Based on the Filtered Dashboard)

When filtered for India, the dashboard yields the following key insights:

- Average Inflation Rate: .
- Maximum Inflation Rate: .
- Volatility: recorded changes in the inflation rate indicate substantial year-to-year fluctuation.
- Inflation Distribution: Most years fall into the moderate inflation category, representing 83.82% of the data points, which suggests economic stability for most of the analyzed period.

The project successfully met its objective, and the use of Power BI tools (filters, slicers, DAX, and visuals) resulted in an informative, user-friendly, and performance-efficient report.

Future Scope

The current Power BI project provides a strong foundation for analyzing global inflation data; however, there is significant potential to expand and enhance the analysis in the future. Some possible future developments include:

1. **Real-Time Data Integration:** Connect APIs or live data sources to update inflation trends dynamically as new economic data is released.

2. **Predictive Analytics:** Implement machine learning models to forecast future inflation rates based on historical data and economic indicators.

3. **Deeper Regional Analysis:** Introduce drill-through pages or hierarchical filters for continent-wise or economic zone-specific insights.

4. **Mobile Optimization:** Design mobile-responsive dashboards for better accessibility on phones and tablets.

5. **Multilingual Reports:** Provide language toggle options to reach a global audience

Appendix

Source Code

No custom source code was used in this Power BI project. The entire analysis, data transformation, and visualizations were created using built-in Power BI features such as Power Query, DAX, and the drag-and-drop visual interface.

GitHub & Project Demo Link

- **GitHub Repository:** https://github.com/R-ayush/Power-BI-Inflation-Analysis-Journeying-Through-Global-Economic-Terrain.git
- **Project Demo Video/Presentation:** https://drive.google.com/file/d/1z40-nXdaPFuyH7KAFr4vHCUPhaMOotEO/view?usp=sharing