# Forecasted U.S. Producer Price Index Analysis (2003–2024)

## Project Overview

This project presents a comprehensive analysis of U.S. Producer Price Index (PPI) forecasts across the agricultural and wholesale markets from 2003 to 2024. By combining SQL querying techniques and Tableau dashboard development, this work extracts insights from over two decades of forecast data, focusing on macroeconomic shifts, category-level volatility, and critical outlier periods that align with major national and global events. The final dashboard is designed to be interactive and insightful for stakeholders, policymakers, and business analysts evaluating inflationary trends in wholesale pricing.

## Dashboard Elements & Analytical Insights

### 1. Forecast Trends by Category

Using SQL-driven aggregation and filtering, this line graph tracks the average forecast percent change for each commodity across the 2003–2024 window. The analysis reveals significant price fluctuations over time, with noticeable peaks and dips corresponding to broader economic conditions. Items such as farm-level eggs and dairy show pronounced variability, indicating sensitivity to economic and environmental disruptions.

### 2. Forecast Volatility Heatmap (Standard Deviation)

This visual presents the standard deviation of forecast percent change by commodity and year. Higher deviation values are color-coded, highlighting years with greater forecasting uncertainty. The heatmap visually confirms volatility surges during pivotal years like 2008 (financial crisis), 2012 and 2016 (U.S. election cycles), and 2020 (COVID-19 pandemic). These periods demonstrate how macroeconomic shifts amplify market unpredictability across food-based commodities.

### 3. Forecast Outliers

This chart isolates extreme changes in forecasted prices (e.g., > ±10%). Outliers are identified by comparing the average forecast change against historical norms. Spikes in volatility during 2008 and 2020 stand out clearly, emphasizing the disruptive effects of global financial and public health crises on U.S. wholesale commodity forecasts.

### 4. Pivotal Years KPI

A focused KPI panel highlights the impact of four pivotal years—2008, 2012, 2016, and 2020—on forecast behavior. These years correspond with historically significant events: the financial collapse, election-year policy uncertainty, and a global pandemic. Each year recorded a marked deviation in forecasted price change averages, reinforcing the correlation between socio-political events and economic market expectations.

## Technical Skills Demonstrated

- SQL: Data filtering, aggregation, trend analysis, outlier identification, and pivoting  
- Tableau: Dashboard development using line graphs, heatmaps, KPI panels, and outlier detection visuals  
- Data Interpretation: Mapping real-world events to forecasted economic shifts  
- Visualization Design: Crafting interactive dashboards for business storytelling and decision-making

## Conclusion

This project offers a rich, data-driven perspective into the behavior of wholesale price forecasts over 21 years, contextualized by key economic events. It demonstrates a full-stack analytical workflow—from SQL-based data preparation to Tableau dashboard presentation—highlighting both technical skills and domain-relevant storytelling. The final deliverables serve as a robust addition to my data analysis portfolio, tailored for recruiters, hiring managers, and executive stakeholders interested in economic intelligence and forecasting trends.