MODELING U.S. HOUSEHOLD CONSUMPTION USING ECONOMIC INDICATORS IN EVIEWS

1. Overview

Client:

A U.S.-based consumer economics think tank serving retail sector strategists, central bank advisors, and investment analysts

Objective:

To forecast household consumption trends in the U.S. using EViews time series modeling, incorporating macroeconomic indicators such as disposable income, interest rates, and inflation. The goal was to support retail demand forecasting and fiscal policy design.

2. Background

Understanding the responsiveness of consumer spending to changes in income and monetary conditions is critical for both corporate and public decision-making. The client's previous models used simple trend analysis in Excel, lacking dynamic forecasting capacity. EViews was introduced to perform econometrically sound time-series modeling using macroeconomic data.

3. Data Summary

Time Period:

Q1 2000 – Q4 2022 (92 quarterly observations)

Variables Used:

Variable	Description	Source
Consumption_Expenditure	Real household final consumption (log form)	U.S. Bureau of Economic Analysis
Disposable_Income	Real disposable personal income (log form)	U.S. BEA
Interest_Rate	Effective federal funds rate	Federal Reserve
CPI_Inflation	Consumer Price Index (Y-o-Y % change)	U.S. Bureau of Labor Statistics

All variables were seasonally adjusted and transformed where necessary to ensure stationarity.

4. Methodology

Software Used:

EViews 13

Model Type:

Multiple Time Series Regression (with Stationarity Correction)

Steps in EViews:

1. **Data Import and Visualization:**

    o Imported all time series via .xlsx

    o Line plots generated to check trends and seasonal behavior

2. **Stationarity Testing:**

    o ADF tests:

       ▪ Consumption and Disposable_Income were I(1)

       ▪ Interest_Rate and Inflation were I(0)

3. **Differencing and Model Estimation:**

    o Log-differenced variables where required

    o *Quick > Estimate Equation*

    o Dependent variable: Δlog(Consumption)

    o Independent variables: Δlog(Disposable_Income), Interest_Rate, Inflation

4. **Diagnostics and Forecasting:**

    o Residual tests: White and Breusch-Godfrey for heteroskedasticity and autocorrelation

    o Stability tests: CUSUM and recursive residuals

    o 8-quarter out-of-sample forecast produced

5. Key Results

Predictor	Coefficient (β)	p-value	Interpretation
Δlog(Disposable_Income)	+0.82	0.000	1% increase in real income leads to 0.82% increase in spending
Interest_Rate	−0.17	0.021	Higher rates reduce spending; significant short-term drag
CPI_Inflation	−0.09	0.036	Inflation negatively affects real purchasing behavior

Adjusted R²: 0.76
F-statistic: Significant at 1%
Forecast RMSE (2021–2022): 0.21 log points

6. Visual Outputs (from EViews)

- Actual vs. Forecasted household consumption graph
- Residual histogram with fitted normal curve
- CUSUM plot showing model stability
- Forecast trend bands (95% confidence)

7. Deliverables

- EViews .wf1 file with labeled variables, full equation setup, and forecast model
- Report (14 pages) including:
    - Theory behind consumption modeling
    - Step-by-step breakdown of EViews implementation
    - Interpretation of coefficients and economic relevance
    - Charts and diagnostics
- Forecast data in Excel for integration with retail and macro dashboards

8. Outcomes & Client Application

- Used by client's consumer economics team to brief U.S. retail associations on near-term demand

- Referenced in client's 2023 Q1 macroeconomic forecast bulletin

- Incorporated into fiscal simulation tools for tax rebate scenario modeling

9. Strategic Value Delivered

- Provided a statistically sound and easily updateable **forecasting model for consumer behavior**

- Enabled the client to **link monetary and inflationary changes to real-world spending forecasts**

- Supported **multi-sector planning** with EViews' clear structure and exportable results