Group Project 1: Statistical Analysis of a Currency (Japan)

Logan Rechin, Joe White
ECO 442

Part 1: FRED Graph

The following figure shows the daily nominal exchange rate for Japan against the U.S. dollar over the past 10 years. Denoted as:

$$E_{\text{yen}/\$} \;=\; \text{yen per 1 U.S. dollar.}$$

Figure 1: Japanese Yen per U.S. Dollar, daily nominal exchange rate.

Part 2: Hotel

Japan's capital city is Tokyo. The hotel we chose is the Trunk Cat Street. The cost for one night is:

$$P_{\text{yen}} = ¥669{,}944.$$

Part 3: Convert the hotel price into U.S. dollars on two days

To convert from yen into dollars using a yen-per-dollar quote:

$$P_{\$} = \frac{P_{\text{yen}}}{E_{\text{yen}/\$}}.$$

(1) **Wed Nov 26:** $E_{\text{yen}/\$} = 156.38$

$$P_{\$}^{\text{Nov 26}} = \frac{669{,}944}{156.38} = 4284.08, \qquad \Rightarrow \qquad P_{\$}^{\text{Nov 26}} \approx \$4{,}284.08.$$

(2) **Fri Nov 28:** $E_{\text{yen}/\$} = 156.17$

$$P_{\$}^{\text{Nov 28}} = \frac{669{,}944}{156.17} = 4289.84, \qquad \Rightarrow \qquad P_{\$}^{\text{Nov 28}} \approx \$4{,}289.84.$$

Part 4: Appreciation/depreciation

The exchange rate fell from 156.38 to 156.17 yen per dollar. Because $E_{\text{yen}/\$}$ is quoted as yen per \$1, a decrease in $E_{\text{yen}/\$}$ means the yen **appreciated**.

Holding the hotel price fixed at ¥669,944, the U.S. dollar price increased from approximately \$4,284.08 to \$4,289.84. The change in the dollar price was:

$$\$4{,}289.84 - \$4{,}284.08 = \$5.76.$$

Thus, the yen's slight appreciation made the hotel **\$5.76 more expensive** for a U.S. tourist on Nov 28 compared to Nov 26.