AN ECONOMETRIC STUDY INVESTIGATING THE IMPACT OF EXCHANGE RATE VOLATILITY ON INBOUND TOURISM REVENUE IN SELECTED EMERGING MARKETS USING MULTIPLE LINEAR REGRESSION IN MINITAB.

1. Background & Rationale

Tourism is a key revenue stream for many emerging economies, but its flow is often affected by macroeconomic conditions—especially exchange rate fluctuations. A volatile or weakening currency may attract more foreign tourists (due to cost advantage) or repel them (due to instability concerns). This study aims to model this relationship and provide actionable insights to tourism boards and economic planners.

2. Objectives

- To assess the quantitative impact of monthly exchange rate volatility on tourism revenue in emerging economies.
- To distinguish between short-term shocks and longer-term currency trends in influencing tourist behavior.
- To provide statistical evidence for policy decisions regarding exchange rate management and tourism promotion.

3. Data Source and Structure

Study Countries:

Thailand, Mexico, Turkey (Jan 2016 – Dec 2023)

Dataset Structure:

Variable	Type	Description
Tourism_Revenue (USD mn)	Dependent	Monthly inbound tourism revenue reported by national banks/statistics depts
Exchange_Rate_Index	Independent	Trade-weighted nominal exchange rate index (normalized base: Jan 2016 = 100)

Volatility_Index	Independent	Monthly standard deviation of daily exchange rate movements (%)
Global_Travel_Index	Control	Proxy for global travel demand (Google Mobility or WTTC Index)
Season	Control	Monthly dummy (1 = peak travel months: Dec–Mar, Jun–Aug)

Data Preparation:

- Currency data sourced from World Bank and IMF datasets
- Tourism revenue adjusted for inflation using base year 2016
- Seasonality dummies created manually
- Volatility computed from daily exchange rate values using rolling standard deviation

4. Econometric Methodology

Software Used:

Minitab 21

Model Specification:

$$\text{Tourism\_Revenue}_t = \beta_0 + \beta_1 \cdot \text{Exchange\_Rate\_Index}_t + \beta_2 \cdot \text{Volatility\_Index}_t + \beta_3 \cdot \text{Global\_Travel\_Index}_t + \beta_4 \cdot \text{Season}_t + \epsilon_t$$

Steps in Minitab:

1. **Import and Variable Configuration:**
    - Monthly panel data arranged for each country
    - Dummy variables for seasons encoded in binary
2. **Regression Model:**
    - *Stat > Regression > Fit Regression Model*
    - Used tourism revenue as the response variable
    - Added country fixed effects (manually) via dummy variables
3. **Diagnostics and Checks:**
    - Variance Inflation Factor (VIF) to test for multicollinearity

- Histogram of residuals for normality
- Autocorrelation check using Durbin-Watson statistic

5. Results & Interpretation

Predictor	Coefficient	p-value	Interpretation
Exchange_Rate_Index	-12.3	0.015	Stronger (appreciated) currency lowers revenue, likely due to decreased affordability
Volatility_Index	-23.1	0.004	Increased volatility significantly deters tourists due to perceived risk
Global_Travel_Index	5.8	<0.001	Global mobility trends significantly influence revenue
Season (peak months)	78.5	<0.001	Peak season contributes substantially to monthly earnings

Model Fit:

- $R^2 = 0.81$
- Adjusted $R^2 = 0.79$
- Durbin-Watson = 2.04 (no autocorrelation)
- VIF values under 2.5 (no multicollinearity)

6. Visual Outputs (Created in Minitab)

- Monthly line plot of exchange rate vs. tourism revenue
- Scatterplot with regression line (revenue vs. volatility)
- Histogram of standardized residuals
- Bar chart: Seasonal revenue comparison

7. Recommendations

- Tourism boards should **increase promotions during currency volatility** to mitigate fear-based reductions in travel.

- Governments may consider temporary **currency stabilization mechanisms** during peak seasons to secure revenue.
- Countries with high natural tourist appeal should adopt **real-time currency communication** to assure travelers of value.

8. Future Research Directions

- Use lagged exchange rate values to test delayed tourist response
- Apply a **vector autoregression (VAR)** model in R to capture multi-variable interactions
- Segment the analysis by tourist nationality to study currency origin effects
- Combine with air traffic data for greater predictive power

9. Relevance and Applications

Academic Use:

- Serves as a case study in international macroeconomics and development economics
- Valuable for students of tourism economics, finance, and applied econometrics

Corporate & Government Use:

- Assists **tourism ministries** in understanding the economic consequences of FX market changes
- Useful for **travel agencies and airlines** in adjusting pricing and timing strategies