

Buy Pesos Now or Later?

Analyzing USD-MXN Exchange Rates



MEET THE TEAM



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MEET CARLITO

Traveling to Mexico in three months

Carlito is wondering when to exchange his US dollars to Mexican peso

OUR MISSION

Help Carlito make informed decisions on when to exchange his money



USER STORY

METHODOLOGY

DATA COLLECTION
AND PREPARATION

EXPLORATORY DATA
ANALYSIS (EDA)

INTEREST RATE PARITY
CALCULATION

DATA CLEANING
AND PROCESSING

CORRELATION
ANALYSIS

TIME SERIES
FORECASTING

APPROACH

DATA OVERVIEW

SOURCE

Federal Reserve Bank of St. Louis
FRED (Federal Reserve Economic Data)

...A reliable government data source that provides economic data

SELECTED DATA

Exchange Rate
US Federal Funds Rate
US 90-Day T-bill Rate
Mexico 90-Day T-bill Rate
US Real GDP
Mexico Real GDP
US Inflation Rate
Mexico Inflation Rate
US Unemployment Rate
Mexico Unemployment Rate
Oil Prices

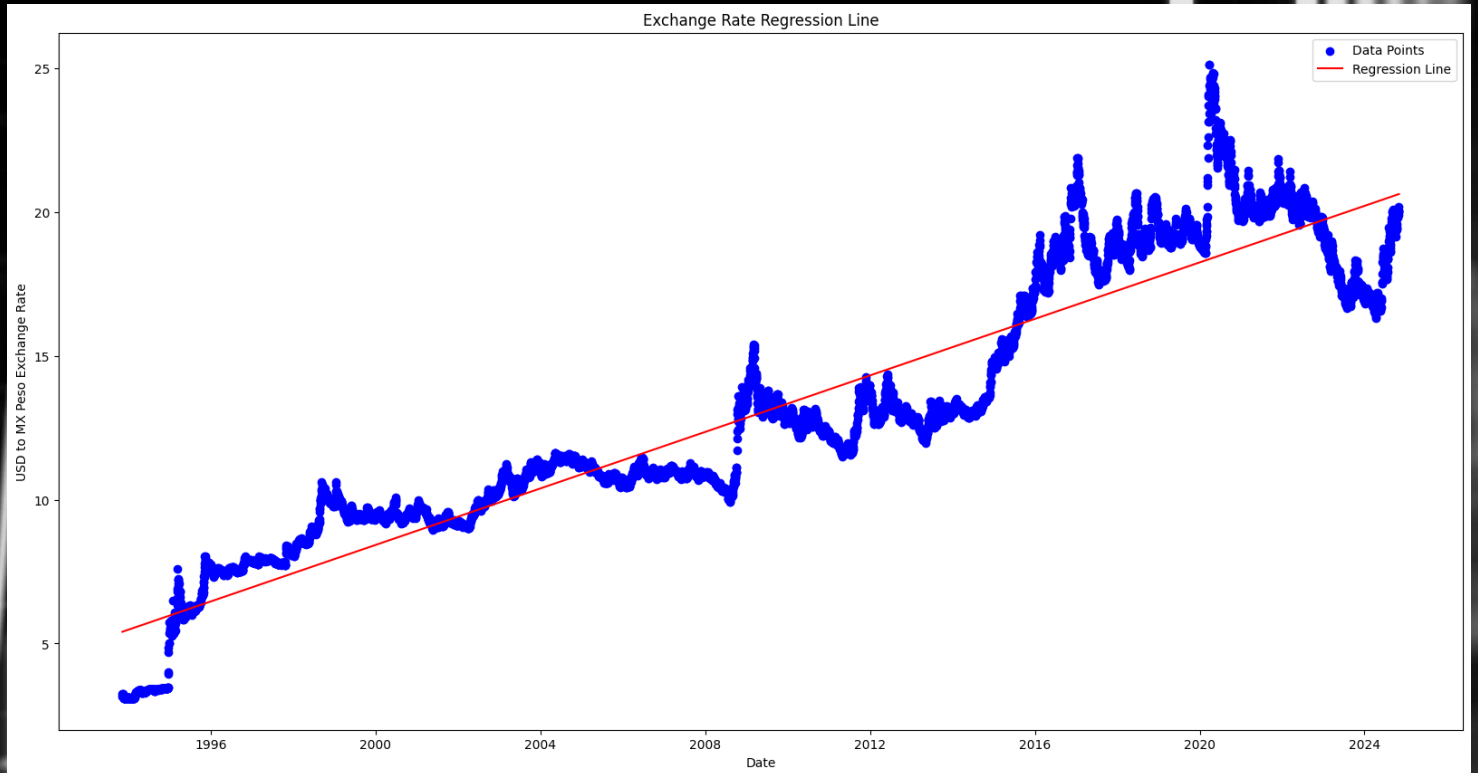
HISTORICAL TREND W LINEAR REGRESSION

PURPOSE

Displays the historical trend
Features a linear regression
line overlaid on the exchange
rate data points

OBSERVATIONS

Model may not be effective for long-term forecasting. Continuous upward trend. Observing model's limitation in capturing reversals or volatility.



MOVING AVERAGE TREND WITH KEY EVENTS

PURPOSE

Chart displays a 3-year moving average and confidence intervals to detect unusual changes in the exchange rate.

OBSERVATIONS

Large spikes during economic events suggest USD acts as a 'safe haven' during economic shocks.

- The 1994 Tequila Crisis
- The 2008 Financial Crisis
- The 2020 COVID-19 Pandemic



KEY ECONOMIC INDICATORS CORRELATION

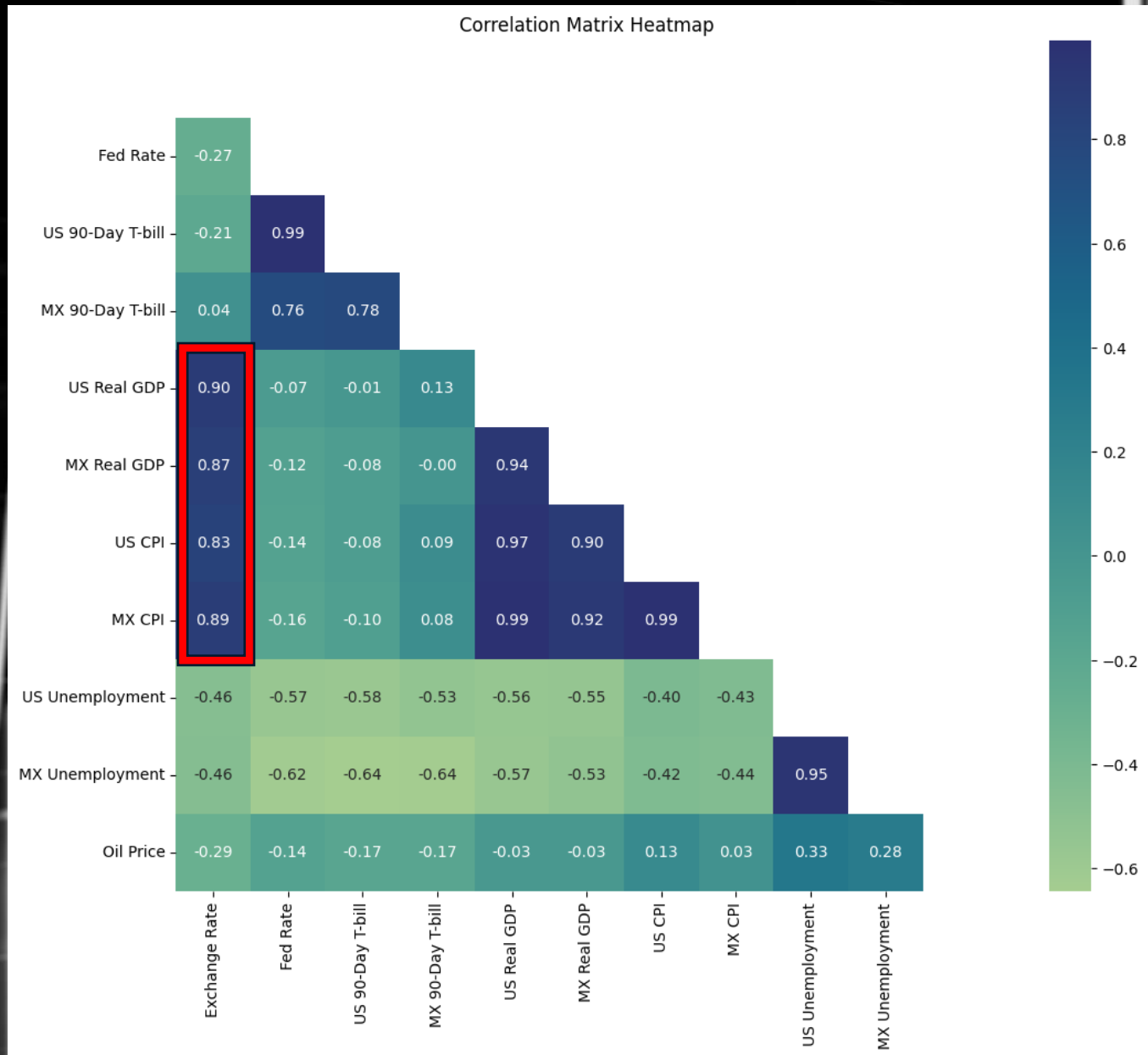
PURPOSE

Heatmap shows the correlation between the exchange rate and various economic indicators.

OBSERVATIONS

High positive correlation w GDP & Inflation.

Moderate negative correlation with US Fed Rate and US 90-day T-bill.
Weak negative correlation with oil prices.



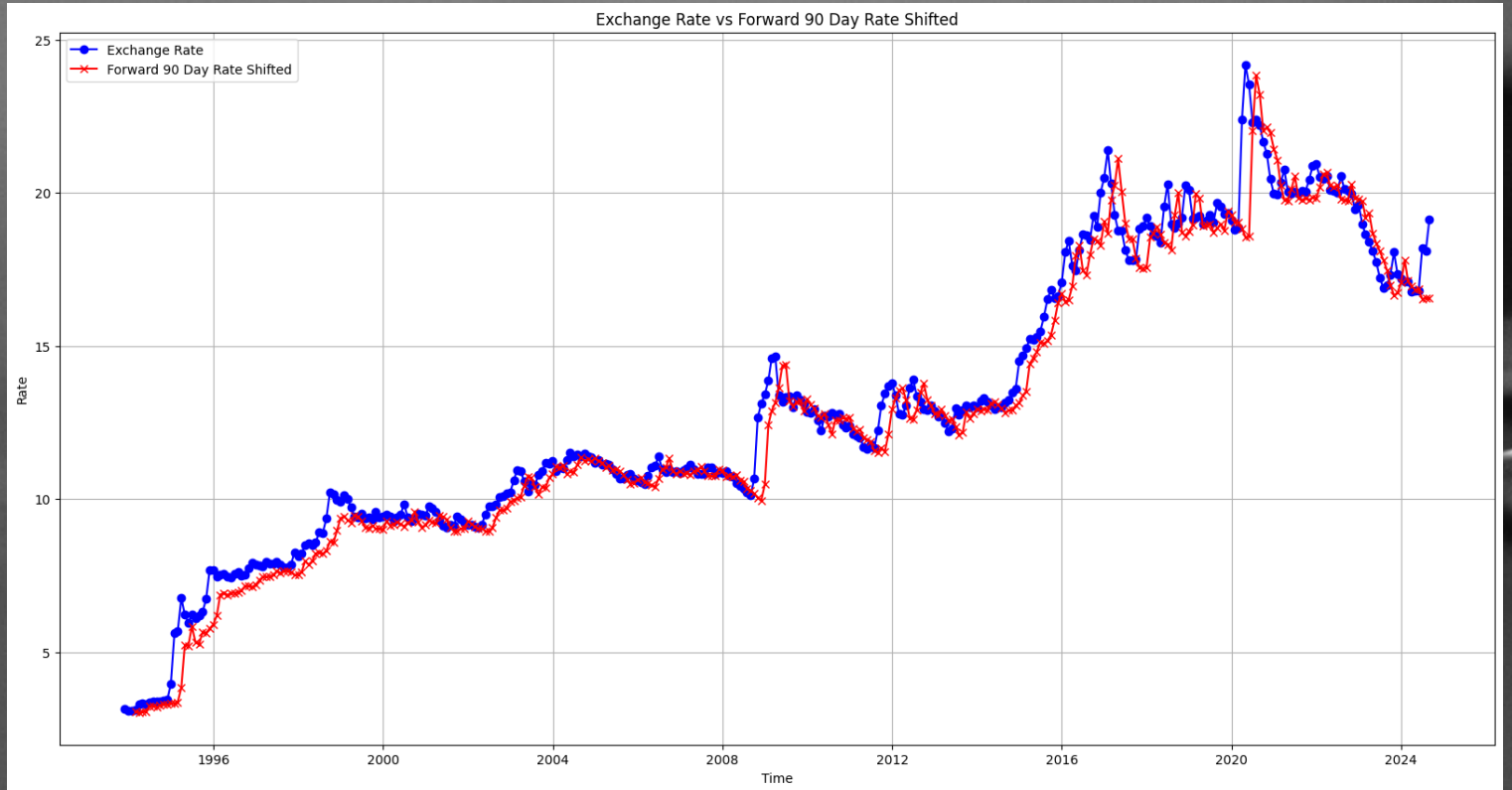
USD-MXN EXCHANGE RATE VS IRP ANALYSIS

PURPOSE

Compares actual interest rate vs forecasted exchange rate 90 days into the future.

OBSERVATIONS

While the IRP works well for short-term predictions, data quality prevented further analysis over a longer time frame.



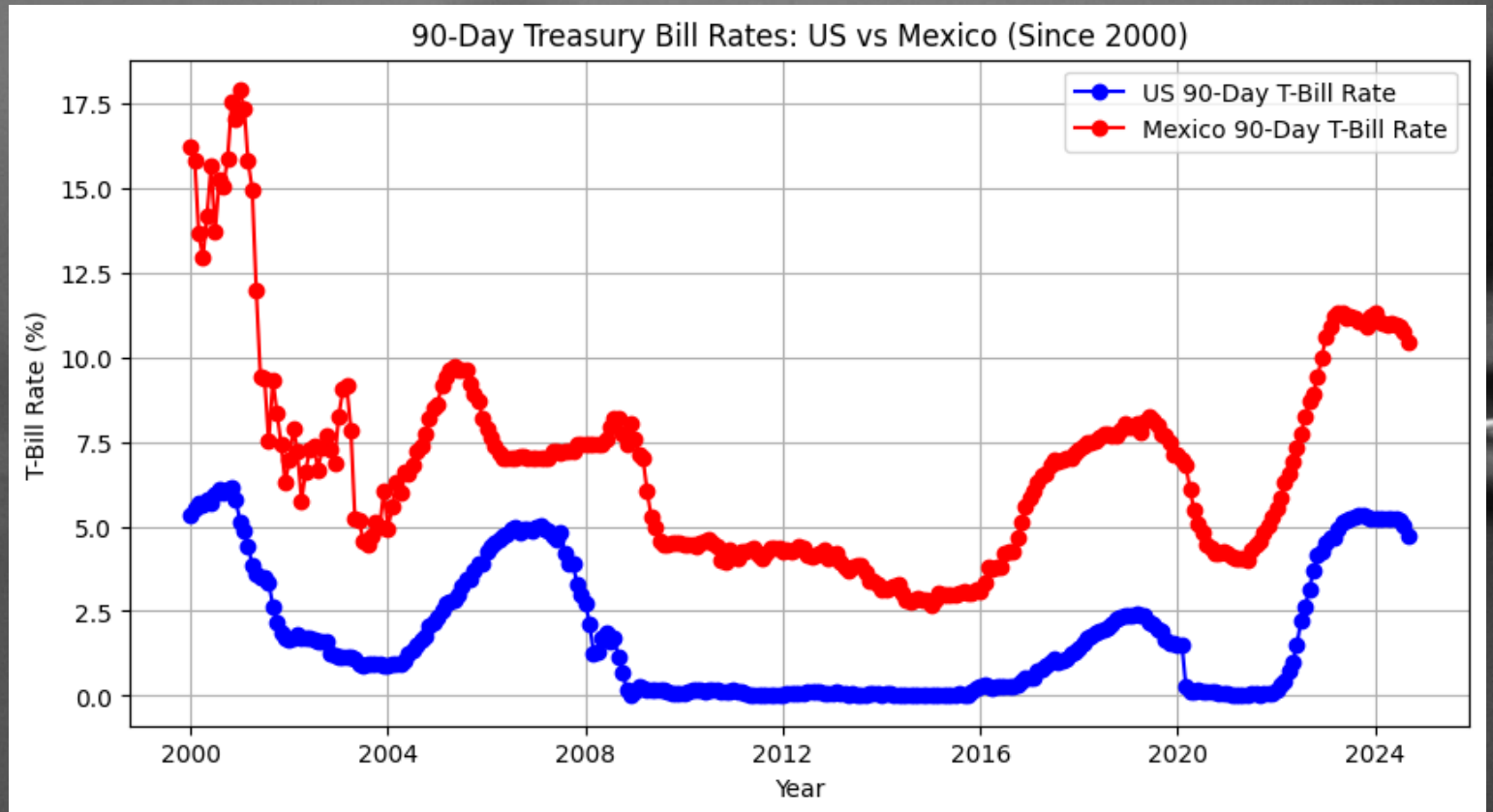
HISTORICAL 90-DAY TREASURY BILL RATES

PURPOSE

Compares 90-Day Treasury Bill rates for US and Mexico

OBSERVATIONS

Other factors play a more important role than the 90-day treasury bill rates. According to the chart, the US dollar should always depreciate.



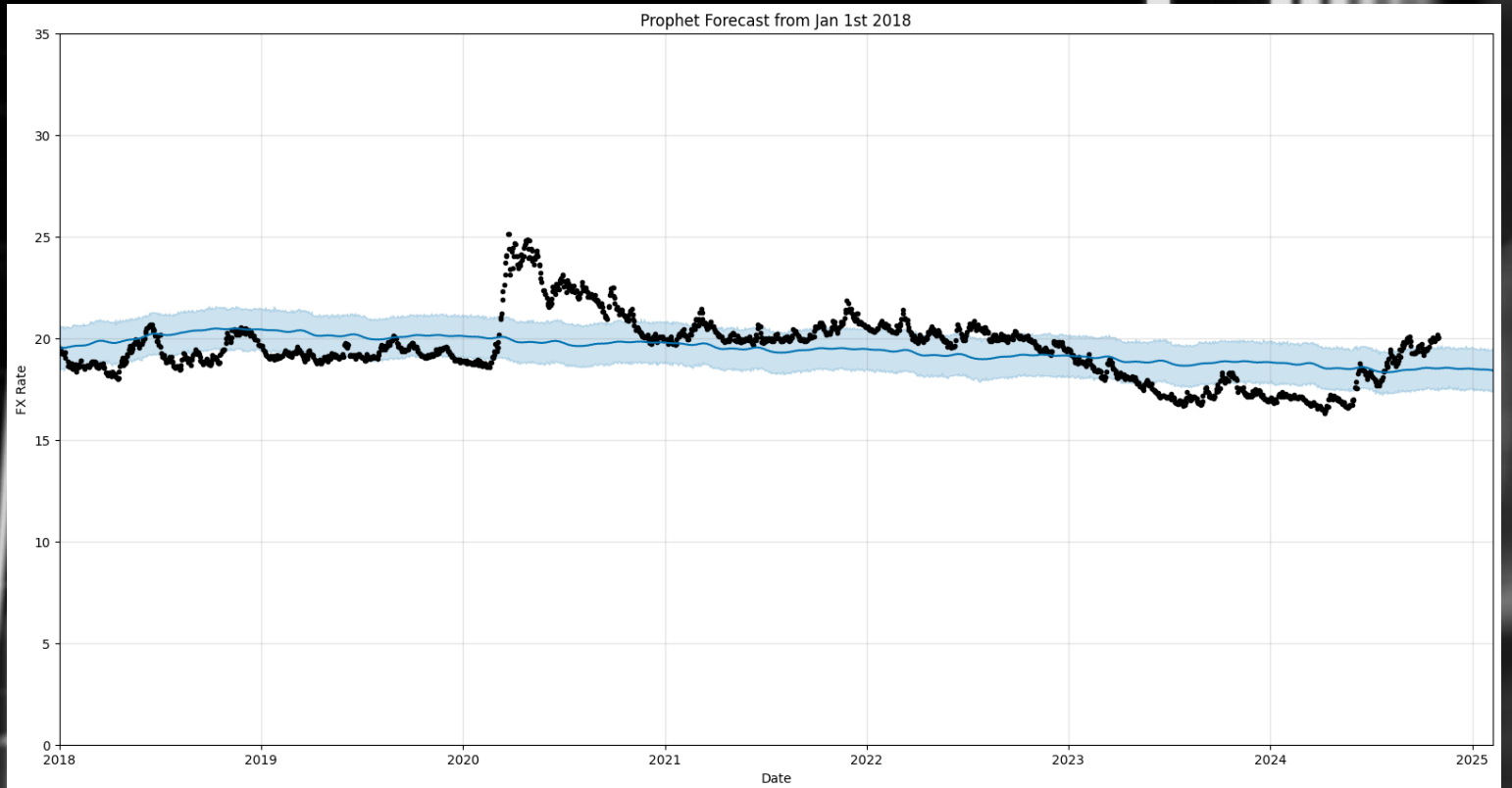
7-YEAR FORECAST FROM 2018

PURPOSE

This 7-year Prophet forecast from 2018 provides insight into the model's capability for long-term trend identification and seasonal pattern recognition.

OBSERVATIONS

Fails to capture broad seasonal trends. Struggles to accurately predict short-term spikes caused by economic events like the pandemic. Model performs better in stable environments.



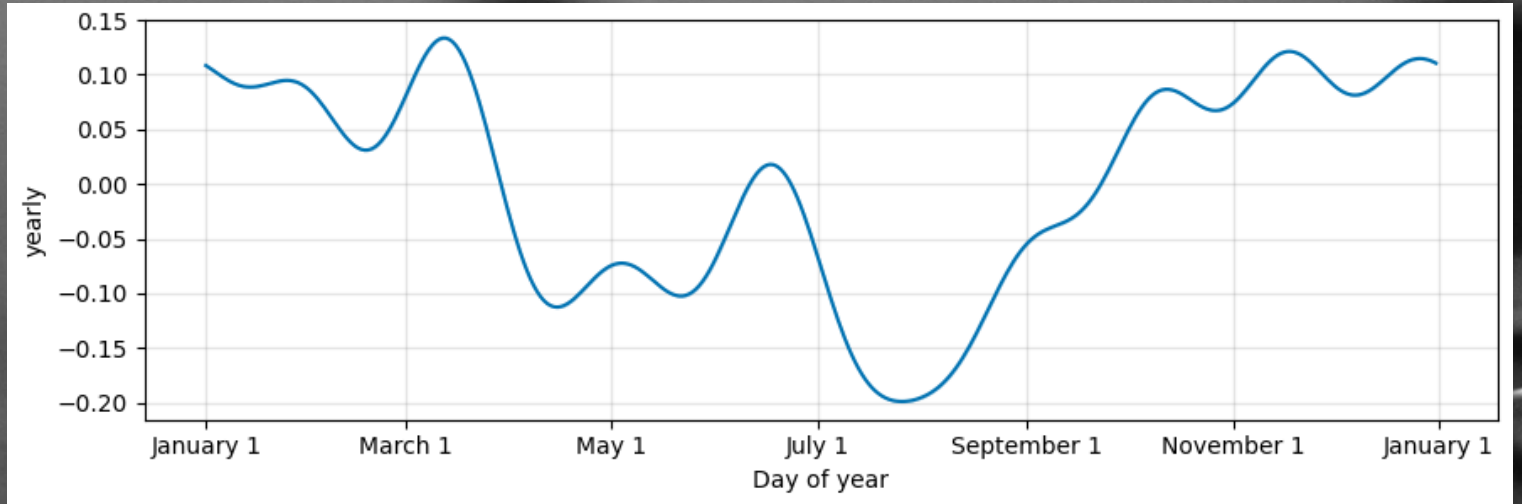
SEASONAL TRENDS IN EXCHANGE RATE BEHAVIOR

PURPOSE

Prophet's components plot breaks down the forecast into trend, weekly, and yearly seasonal effects (shown here).

OBSERVATIONS

Reveals a consistent but small seasonal pattern, with the US dollar generally appreciating during winter and weakening in summer. There are a number of factors that could be influencing the seasonal fluctuations.



RECOMMENDATION: Exchange USD to MXN Now

ACT NOW TO MAXIMIZE VALUE!

Goals	USD to MXN
Historical Trends	Depreciate
Correlation	Mixed
Interest Rate Parity	Depreciate
Prophet Forecast	Depreciate

FUTURE OPPORTUNITIES

OTHER
CURRENCIES

ON-DEMAND
FORECASTING

USER-FRIENDLY
APP

ENHANCED MODEL
COMPLEXITY

AUTOMATED DATA
UPDATES

PREDICTIVE
ANALYTICS

THANK YOU!



QUESTIONS OR COMMENTS?

We would love to hear from you...

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Florina Monroy

William Hall



APPENDIX

30- YEAR USD to MXN PROPHET FORECAST

