In this project, you will do econometric analysis of (covered) interest rate parity (IRP). IRP states that differences between interest rate across countries can be explained by expected changes in currencies. For example, an expected depreciation of Yen against the US dollar, say, raises Japanese interest rates compared to US interest rates in order to compensate American investors for the expected currency loss. IRP theory can be tested empirically by regressing change in the spot exchange rate on the interest rate difference between home and foreign countries as:

\[ s_{t+1} - s_t = \alpha + \beta(i_t - i_t^f) + \zeta_{t+1} \]  

where \( s_t \) is the natural log of the spot exchange rate, \( s_{t+1} \) is the natural log of forward exchange rate (expected rate of spot rate), \( i_t \) is nominal interest rate in the home country, \( i_t^f \) is nominal interest rate in the foreign country and \( \zeta_{t+1} \) is an error. \( \alpha \) and \( \beta \) will be estimated through regression analysis.

Here are the necessary steps to estimate the IRP model and write a report on your analysis:

- **Data for exchange rates and interest rates:**
  - Go to \textit{library.bilkent.edu.tr}
  - Click \textit{On-Line Databases}
  - Find Statistical Databases and \textit{Global Financial Data} and click \textit{go to database}

- **Use 3-months Time Deposit Rates or 3-month Certificate of Deposits Rates (Average) for interest rate data**

- **Study for the period 1980-2005 with quarterly frequency**

- **Download as CVS**
• Use Excel’s regression package: Get into Tools and then Data Analysis to run Regression package

• Estimate IRP under two cases:
  
  – Unrestricted Case: Estimate the above model in equation (1) and interpret the significance of the coefficients considering the correct signs (+/-) of the variables according to the IRP theory. (Hint: If an intercept (\( \hat{\alpha} \)) or a coefficient of \( \hat{\beta} \) has significant impact on explaining changes in short-run fluctuations of exchange rates, the respective p-values should be less than or equal to 0.05 in absolute value (\(|p-values| \leq 0.05\)). Furthermore, the overall model is statistically meaningful as long as reported Signif F \( \leq 0.05 \). For analysis to be complete, interpret the calculated Adjusted \( R^2 \) of the model as well.)

  – Restricted Case: IRP theory argues that \( s_{t+1} - s_t = (i_t - i^I_t) \) i.e.,

  \[
  H_0: \alpha = 0, \beta = 1.
  \]

  One way to test the above hypothesis is to estimate the model without constant term (in the Regression package, select the option that “Constant is Zero”). Then test whether \( H_0 : \beta = 1 \) or not. (Hint: To test the new hypothesis, calculate \( t-stat = (\hat{\beta} - 1)/\sigma_{\beta} \) where \( \hat{\beta} \) is the estimated coefficient on \((i - i^I)\) and \( \sigma_{\beta} \) is standard error of estimated coefficient. If the calculated \(|t-stat| \geq 2\), \( H_0 \) is failed to be rejected. This means that IRP theory perfectly fits to the real data.

• Write a two page formal report (double space and font size: 12pt). Half page for introduction, one page for analysis and half page for conclusion. As an appendix, please add the graph of your data.

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