**Empirical Modeling of the Taylor Rule**

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**Intro**

The Taylor Rule is a reduced form model of the impact of GDP, current interest rates, and inflation on the interest rates set by the Federal Reserve. According to this rule, the interest rate is equal to inflation, plus the equilibrium interest rate, plus a coefficient times the difference between current inflation and desired inflation, plus a coefficient times the difference between current output and potential output:



**Purpose**

Our objective is to compare this rule to the historic interest rate data from the Federal Reserve. In addition to comparing the output of the Taylor Rule to the actual interest rate set, we will create a model to predict interest rates and compare all three outputs. We can add the Taylor Rule variables to our model (GDP, inflation, growth) for a better prediction than a stand alone ARIMA model. We will create an ARIMA, an ETS, and a VAR model so we can look at basic time series predictions as well as predictions with more independent variables.

**Data**

The data for this project is freely available at the “Federal Reserve Economic Data” website (https://fred.stlouisfed.org/). For each year (month) of the last 30 years, we will have the federal funds interest rate, GDP growth gap, and inflation as calculate by the GDP deflator. We will also us the Federal Reserve Bank of Atlanta Taylor Rule approximation data (https://www.frbatlanta.org/cqer/research/taylor-rule.aspx).