Reestimating the Taylor Rules for the Swiss National Bank

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Definitions

- Monetary Policy: Operations of a central bank, especially targeting interest rates, that affect the money supply in a country
- Reference Interest Rate (CH): 3-Month Swiss franc Libor
  - Interbank interest rate for unsecured loans
  - Swiss National Bank (SNB) fixes a target range for the Libor and aims for the middle of the range
- Taylor Rule: Guideline on how a central bank should change the reference interest rate in response to changes in economic factors
- Price Stability (SNB Definition): Rise in CPI of less than 2% per annum

Contributions

- Estimate a Taylor Rule for the SNB that predicts the Libor
- Incorporate backward looking of Taylor's (1993) original equation and forward looking of Markov and Nitschka's (2013) specification for the SNB

Data

- Frequency: Quarterly
- Time Range: Q1, 2004 – Q1, 2015
- Sources:
  - Swiss National Bank:
    - Inflation Forecasts
    - Current Inflation
  - Federal Reserve Bank of St. Louis:
    - 3-Month Libor based on Swiss Franc
    - Real GDP (Millions of Chained 2010 National Currency)
      - Estimate of output gap from HP filter

Method

- Method of Estimation: Ordinary Least Squares (OLS) regression
  - Dependent Variable: 3-Month Libor
  - Independent Variables: Current Inflation, Inflation Forecast, Output Gap

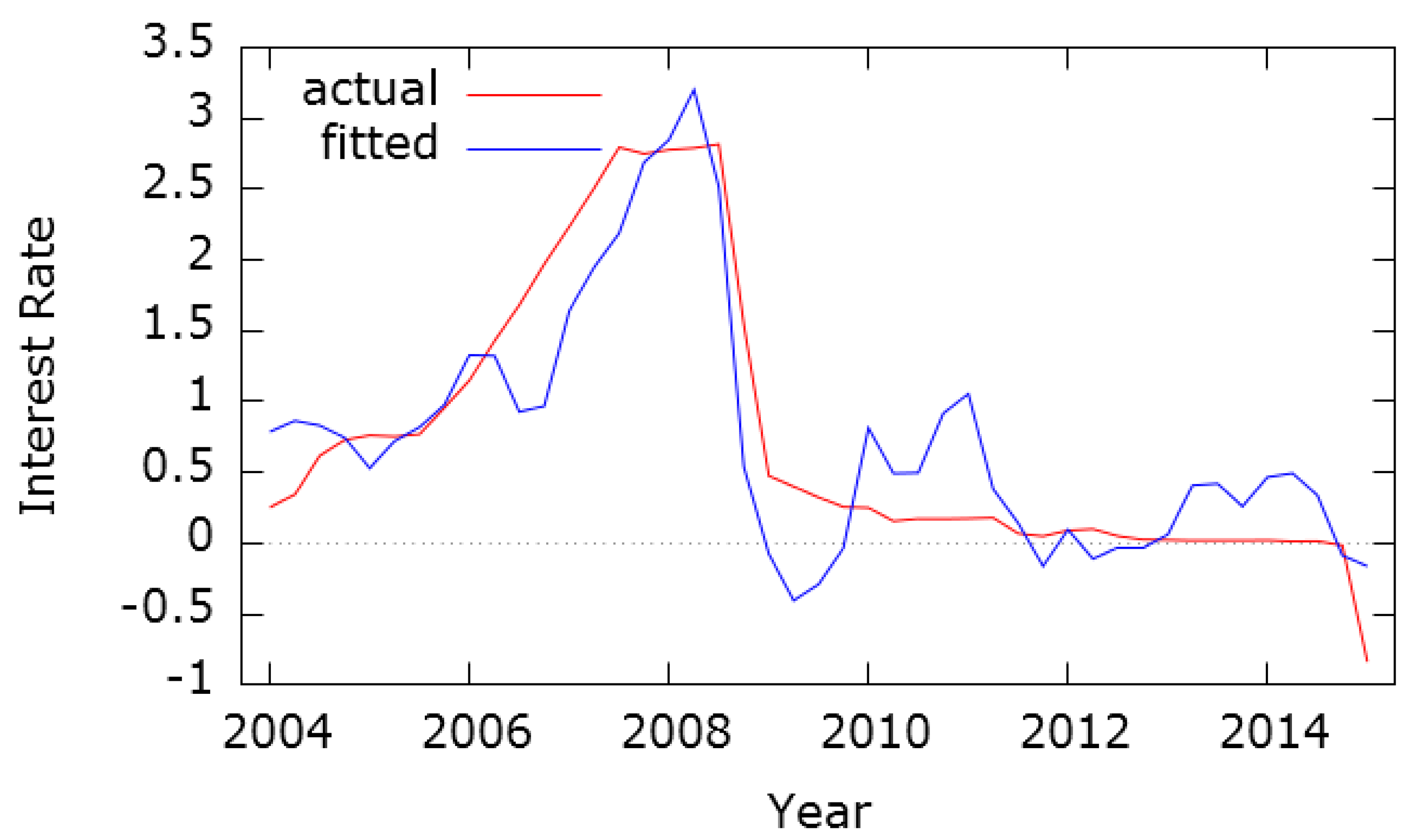
Estimated Equation

$$i_t = (r^*+\pi^*) + \beta_q\pi_t + \beta_{\pi q}(\pi_q - 1) + \beta_Y(Y_t)$$

where:

i_t	is the three-month Swiss Franc Libor in quarter
$(r^*+\pi^*)$	is the constant
r^*	is the natural rate of interest
π^*	is the inflation at the natural rate
π_t	is the current inflation in quarter t
π_q	is the measure of inflation forecast
1	is the target inflation rate
Y_t	is the output gap in quarter t

Actual vs. Fitted Interest Rate



Results

- The rule suggests that:
  - If inflation increases by 1 percentage point, the interest rate should be increased by 1.3 percentage points
  - If the inflation forecast deviates by 1 percentage point above the target rate, the interest rate should be increased by 1.59 percentage points
  - When the output gap widens by 1 percentage point, the interest rate should be increased by 0.84 percentage points

Conclusion

- Model seems to better predict the Libor when including current inflation
- Measure of expected inflation one year from the current period seems to predict better than other forecasts
  - Agrees with SNB's focus on the medium and long term
- Interest rate strongly reacts to inflation forecast and output gap
  - Agrees with Taylor's (1993) work and SNB's monetary policy strategy
- Differences between actual and fitted residuals can be explain by:
  - Unconventional measures during financial crisis measures during financial crisis
  - Surging oil prices and uncertainty
  - SNB's normalization of interest rates

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