

Empirical Project Part 1

For the Empirical Project Part 1, the country - Switzerland - is chosen for the investigation of the Industrial Production Index and Interbank Rate (the “Interest Rate”) relationship. The data were taken predominantly from fred.stlouisfed.org (Economic Research Federal Reserve Bank of St. Louis).

The dataset for both Industrial Production Index and Interest Rate was proposed to be quarterly and seasonally adjusted. Since the lower boundary for Interest Rate was the first quarter of 1972 and the upper boundary of the Industrial Production Index was the fourth quarter of 2018, the time series is set to be from 1972 to 2018, that is, the total number of observations is $n = 180$.

The collected data represents independent random variables with dependent observations that are connected through time series; thus, we introduced new variables in the first difference log form to approach the stationarity condition.

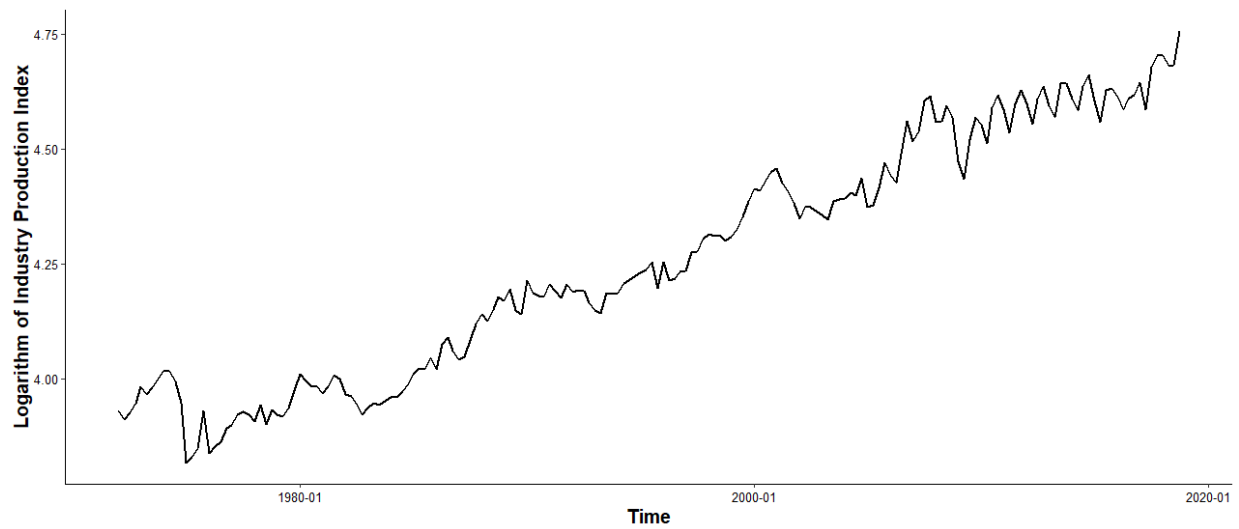
See the summary statistics and the graphical analysis for the input variables below.

Table 1. Summary statistics.

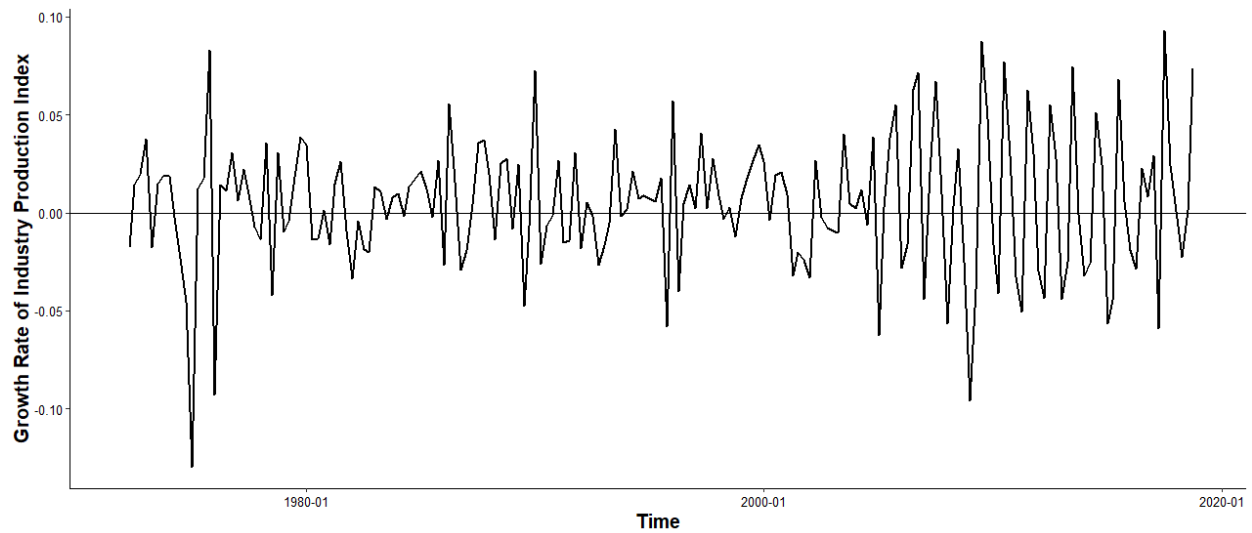
Date	IP	IR
Min. :1972-01-01	Min. : 45.49	Min. : -1.8667
1st Qu.:1983-09-08	1st Qu.: 54.55	1st Qu.: 0.1183
Median :1995-05-16	Median : 68.04	Median : 1.6325
Mean :1995-05-17	Mean : 73.03	Mean : 2.1395
3rd Qu.:2007-01-23	3rd Qu.: 89.57	3rd Qu.: 3.3415
Max. :2018-10-01	Max. :116.18	Max. : 8.8679

dIR	lIP	gIP
Min. : -2.592563	Min. : 3.818	Min. : -0.129441
1st Qu.: -0.336213	1st Qu.: 3.999	1st Qu.: -0.016171
Median : -0.006667	Median : 4.220	Median : 0.005378
Mean : -0.004967	Mean : 4.257	Mean : 0.004415
3rd Qu.: 0.310982	3rd Qu.: 4.495	3rd Qu.: 0.024931
Max. : 2.456812	Max. : 4.755	Max. : 0.092743
NA's :1		NA's :1

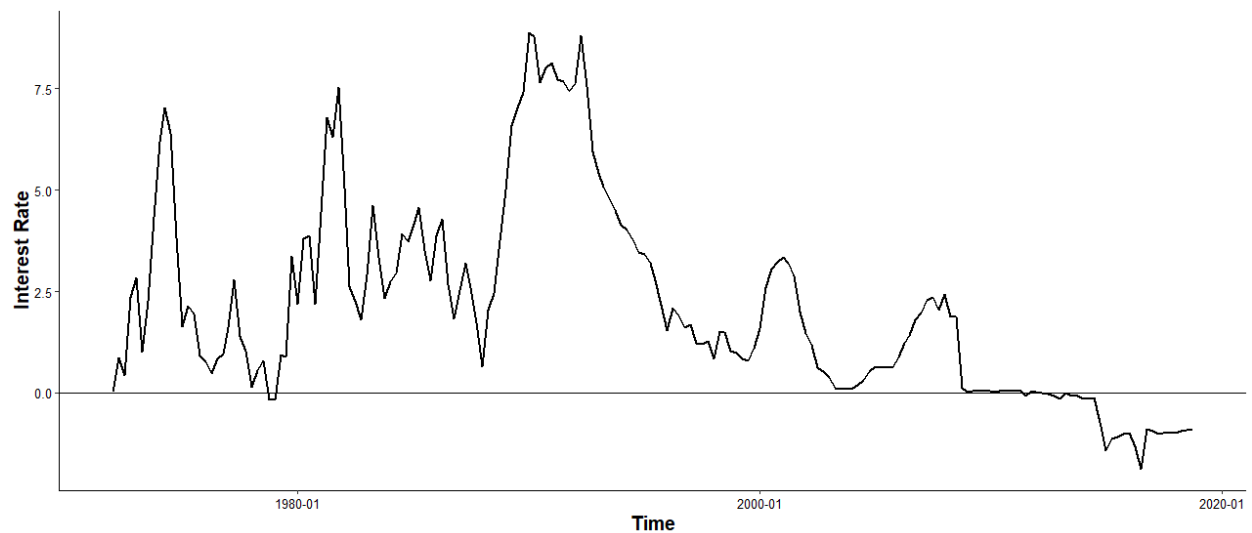
Graph#1. Scatter plot of the logarithm of the Industry Production Index.



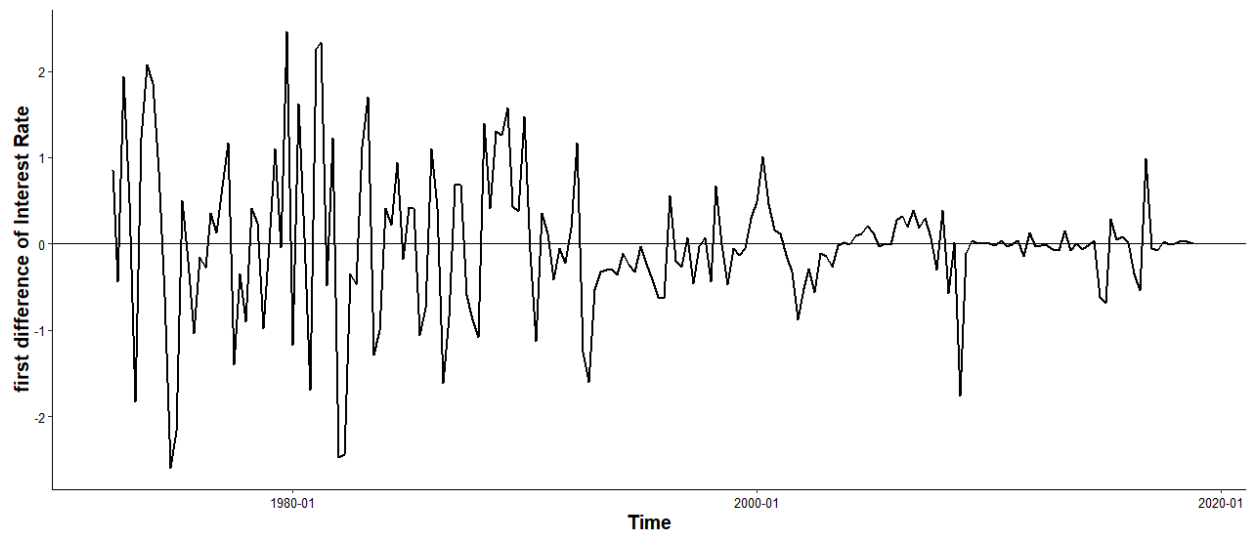
Graph#2. Scatter plot of the first difference of logarithm of Industry Production Index.



Graph#3. Scatter plot of Interest Rate.



Graph#4. Scatter plot of the first difference of Interest Rate.



From the graphical analysis above, we can denote that both logarithm of the Industry Production Index and Interest Rate variables are not stationary and the former one exhibits the trending pattern. However, as it was mentioned earlier, both variables vaguely meet the stationarity condition by transforming them into their first differences.