Addition to Lecture 5/6: Norwegian Phillips Curve
3150/4150 Lecture 5

Ragnar Nymoen

Department of Economics, University of Oslo

30 January 2012
Consider the Norwegian Phillips Curve over long time period: 1904-2009.

Annual data

Consider scatter plot of

- Inflation rate in percent $INF$
- Rate of unemployment in percent, $U$
If there is a relationship, then

Highly linear

Graph with 4 linear regressions
Attempt

\[ INF_t = \beta_1 + \beta_2 \left( \frac{1}{U_t^2} \right) + e_t \] (1)

which is a “more convex” function than, for example

\[ INF_t = \beta_1 + \beta_2 \ln U_t + e_t \]

Note

\[ \frac{\partial INF_t}{\partial U_t} = -2\beta_2 \frac{1}{U_t^2} \]

so that to find a Phillips curve, requires rejecting

\[ H_0: \beta_2 = 0 \text{ against } H_1: \beta_2 > 0 \]
OLS give

\[ INF_t = 0.677987 + 17.2824 \left( \frac{1}{U_t^2} \right) \]  

(2)

with \( \hat{se}(\hat{\beta}_j) j = 1, 2 \) below the estimates.

- \( p - Value \) is 0.000
- \( H_0 \) is rejected.

Next graph shows scatter plot of \( INF_t \) and against \( \hat{INF}_t \) from (2)
Addition to Lecture 5/6: Norwegian Phillips Curve

Department of Economics, University of Oslo
- Confidence interval for $E(INF_t) = \mu_t$ is likely to be wide here....
- Actual and fitted against time shows that PCM is incomplete explanation—to put it mildly
- But hardly surprising since inflation is a complex socio-economic phenomena
- We need a larger model—estimated by multiple regression (Topic 6 and 7)
Addition to Lecture 5/6: Norwegian Phillips Curve

Department of Economics, University of Oslo