Supervision 4
Unemployment

Short questions (max 1.5 page handwritten)

1. The employment rate $n_t$ in an economy evolves according to

$$n_{t+1} = (1 - \lambda) n_t + f u_t$$

where $\lambda$ denotes the job separation rate, $f$ the job-finding probability, and $u_t$ the unemployment rate in period $t$. [cf Tripos 2013]

(a) Derive the steady-state unemployment rate $u_{ss}$.

(b) Now suppose that both the job-finding probability and the separation rate change to $\hat{f} = \gamma f$ and $\hat{\lambda} = \gamma \lambda$, respectively, for some $\gamma > 0$. Show mathematically how this change affects the steady-state unemployment rate, and briefly discuss how it may affect the welfare of an unemployed worker.

(c) Lastly, for any $u_t \neq u_{ss}$, how does the above change in the job-finding probability and separation rate affect the transition back to the steady-state rate of unemployment? Is it faster or is it slower? Explain briefly.

2. Consider the following stylised Phillips curve

$$\pi_t = \pi^e_t + \alpha - \beta u_t,$$

where $\pi_t$ denotes the inflation rate, $\pi^e_t$ the expected inflation rate and $u_t$ the unemployment rate. The subscript $t$ denotes the time period.

Define the natural rate of unemployment, $u_n$, and rewrite the above relationship in terms of $u_n$.

Suppose that the population can be divided into two subgroups. The first group, which comprises a fraction $\gamma$ of the population, has rational expectations such that $\pi^e_t = \pi_t$. The second group, which then comprises the fraction $(1 - \gamma)$, has adaptive expectations such that $\pi^e_t = \pi_{t-1}$. Derive an expression for $\pi_t$ in terms of $u_t$ and $u_n$. How does the slope of the Phillips curve change depending on the parameter $\gamma$? Use the logic of the Aggregate Supply curve to provide an intuitive explanation. [cf Tripos 2014]

Essay questions (1000 words max)

3. Discuss the notion of a trade-off between inflation and unemployment from a theoretical and empirical perspective. [Tripos 2009]
4. In 2008, the Consumer Price Index (CPI) in the United States fell and has remained 4 percent below its trend. The unemployment rate in the United States rose to around 10 percent, and slowly declined over the course of six years. Is this pattern consistent with the NAIRU theory? (Note: The trend of CPI is defined as the level that would have materialised under an uninterrupted inflation rate of 2 percent per year.) [Tripos 2015]

Main readings

- Blanchard (2017), *Macroeconomics*, chapter 7, 8 and 13

Supplementary references
- Carlin and Soskice (2006), *Macroeconomics: Imperfections, Institutions and Policies*, chapter 2.5-2.6, 4, 15.8 & appendix, 18
- Layard, Nickell and Jackman (1994), *The Unemployment Crisis*.