

Exam of the course “Monetary Economics”

Two hours. Course presentation slides allowed, in paper format, possibly with hand-written annotations (on the slides or on separate sheets). No other document allowed, nor any electronic device (calculator, mobile phone...).

The grading scale, which may be modified, is indicated only for general-guidance purposes.

1 Exercise (12 points)

The goal of this exercise is to study some positive and normative implications of “external consumption habits” in the basic New Keynesian model. To do so, we make the same assumptions as in the basic New Keynesian model with technology shocks and without cost-push shocks (studied in Chapter 1 of the course), except that the representative household’s instantaneous utility function is now

$$U(C_t, N_t) = \frac{(C_t - h\bar{C}_{t-1})^{1-\sigma} - 1}{1-\sigma} - \frac{N_t^{1+\varphi}}{1+\varphi},$$

where $h \in [0, 1)$ and $\bar{C}_{t-1}$ denotes average consumption across households at date $t-1$ (the other notations are the same as in the course). Thus, the instantaneous utility of an individual household depends on how his/her own consumption level at a given date compares with a fraction h of the average consumption level across households at the previous date. This specification is called “external consumption habits” or “catching up with the Joneses”.

One can answer each question without having answered the previous questions, simply by using the results given in these previous questions. To save time, **one can use all the results established in the course**, without having to prove them again. Computations that are similar but not identical to some computations in the course need not be detailed : one can just explain how the results can be directly inferred from the results in the course.

Question 1 Can you see why this specification is called “external consumption habits” ?

Question 2 Briefly explain why the log-linearized first-order condition of firms’ optimization problem can still be written as

$$\pi_t = \beta \mathbb{E}_t \{\pi_{t+1}\} + \chi (\mu + mc_t)$$

(like in the course). Briefly explain why households’ labor-consumption trade-off condition is now

$$(C_t - h\bar{C}_{t-1})^\sigma N_t^\varphi = \frac{W_t}{P_t}.$$

Log-linearize this equation around the steady state to get

$$w_t - p_t = \varphi n_t + \frac{\sigma}{1-h} (c_t - h\bar{c}_{t-1}) + \sigma \log(1-h).$$

How do c_t , $\bar{c}_t$ and y_t relate to each other in equilibrium? Following essentially the same reasoning as in the course, deduce the Phillips curve

$$\pi_t = \beta \mathbb{E}_t \{\pi_{t+1}\} + \chi \left[\left(\frac{\sigma}{1-h} + \frac{\varphi + \alpha}{1-\alpha} \right) \tilde{y}_t - \frac{\sigma h}{1-h} \tilde{y}_{t-1} \right].$$

Briefly interpret the difference between this Phillips curve and the one in the course.

Question 3 Consider the interest-rate rule $i_t = \phi_\pi \pi_t + \phi_y \tilde{y}_t$. Write the Taylor principle as an inequality condition involving ϕ_π and ϕ_y . Does this condition involve the parameter h , and why?

Question 4 Briefly explain why we still have

$$\frac{W}{P} = \frac{(\varepsilon - 1)}{\varepsilon(1 - \tau)} (1 - \alpha) A^{\frac{1}{1-\alpha}} Y^{\frac{-\alpha}{1-\alpha}}$$

at the steady state (like in the course), where variables without time subscript denote steady-state values. Using households' labor-consumption trade-off condition (as well as the goods-market-clearing condition and the production function), show that

$$\frac{W}{P} = (1-h)^\sigma Y^{\sigma + \frac{\varphi}{1-\alpha}} A^{\frac{-\varphi}{1-\alpha}}$$

at the steady state. Deduce that if the employment subsidy exactly offsets the monopolistic-competition distortion, then

$$Y^{\sigma + \frac{\alpha + \varphi}{1-\alpha}} = \frac{(1-\alpha) A^{\frac{1+\varphi}{1-\alpha}}}{(1-h)^\sigma}.$$

Question 5 Write the social planner's optimization problem using only aggregate variables, and show that the steady-state output level Y^* chosen by the social planner is such that

$$(Y^*)^{\sigma + \frac{\alpha + \varphi}{1-\alpha}} = \frac{(1-\alpha) A^{\frac{1+\varphi}{1-\alpha}}}{(1-h)^\sigma} (1 - \beta h).$$

Compare Y^* (obtained in this question) to Y (obtained in the previous question). Interpret the comparison outcome as the consequence of an externality (which is a third distortion, beyond monopolistic competition and price stickiness). Given this externality, does optimal monetary policy still perfectly stabilize inflation in response to technology shocks when the employment subsidy exactly offsets the monopolistic-competition distortion (like in the course), and why?

2 Commentary (8 points)

Comment briefly, in the light of the course, upon the following excerpt from the speech entitled "Getting Closer" made by C.J. Waller – Federal Reserve governor – on July 17, 2024. In so doing, explain in particular, in the context of the New Keynesian framework :

(i) why and how to communicate about the state-contingent future policy-rate path ; (ii) why and how to anchor private agents' expectations of future inflation.

“[L]et me say a word about central bank communication — in particular, communication about the policy path. (...) How will you set policy if the data come in different than you expected? It is important to not only lay out your base case, but also alternative paths for policy if your base case is disrupted by incoming data. And for monetary policy, it is even more important to communicate those alternative policy paths to the public so that they can also make plans. (...)

[We] must consider two risks. On the one hand, it is essential that monetary policy get inflation down to a sustained level of 2 percent. If we start to loosen policy too soon, and allow inflation to flare up again, we risk losing credibility with the public and allowing expectations of future inflation to become unanchored. That credibility has helped inflation fall as quickly as it has in the past 18 months and squandering it would be a grave mistake. (...) The other risk is that we wait too long to ease monetary policy and contribute to a significant economic slowdown or a recession, with unemployment rising notably.”