Université des Sciences Sociales de Toulouse
MPSE
Année universitaire 2001-2002
DEA Macroéconomie II — Cours de Franck Portier

Final Exam

I – Problem – Deficits, Inflation and Anticipated Monetary Shocks *(40%)*

Consider an economy populated by a large number of identical individuals. Preferences over consumption and leisure are given by

$$\sum_{t=0}^{\infty} \beta^t c_t^{\alpha} \ell_t^{1-\alpha}$$

where $0 < \alpha < 1$. Assume that leisure is positively related – this is just a reduced form of a shopping time model– to the stock of real money balances, and negatively related to consumption as a measure of transactions

$$\ell_t = A \frac{m_{t+1}}{p_t} c_t^{-\eta} \quad A > 0$$

Each individual owns a Lucas tree that drops y units of consumption per period (dividends). There is a government that issues one period real bonds (promises to deliver $1/R_t$ unit of good in $t+1$, at a current cost 1), money, and collects taxes (lump-sum τ) to finance spending. Per capita spending is equal to g. Thus, consumption equals $c = y - g$. The government's budget constraint is:

$$g_t + B_t = \tau_t + \frac{B_{t+1}}{R_t} + \frac{(M_{t+1} - M_t)}{p_t}$$

Let the rate of return on money be $R_{mt} = p_t/p_{t+1}$. Let the nominal interest rate at time t be $1+i_t = R_t p_{t+1}/p_t = R_t \pi_t$.

1. Derive the demand for money, and show that it decreases with the nominal interest rate
2. Suppose that government policy is such that $g_t = g$, $B_t = B$, $M_t = M$ and $\tau_t = \tau$. Prove that the real interest rate, R, is constant and equal to the inverse of the discount factor.
3. Define the deficit as d, where $d = g + (B/R)(R - 1) - \tau$. Write money demand as $f(R_m)$. What is the highest possible deficit that can be financed in this economy? An economist claims that –in this economy–increases in d, which leave g unchanged, will result in increases in the inflation rate. Discuss this view.
4. Suppose that the economy is open to international capital flows and that the world interest rate is $R^{\star} = \beta^{-1}$. Assume that $d = 0$, and that $M_t = M$. At $t = T$, the government increases the money supply to $M' = (1 + \mu)M$. This increase in the money supply is used to purchase bonds (government bonds). This, of course, results in a smaller deficit at $t > T$. (In this case, it will result in a surplus) However, the government also announces its intention to cut taxes (starting at $T + 1$) to bring the deficit back to zero. Argue that this open market operation will have the effect of increasing prices at $t = T$ by μ%: $p' = (1 + \mu)p$, where p is the price level from $t = 0$ to $t = T - 1$.
5. Consider the same setting as in (4) Suppose now that the open market operation is announced at t = 0 (it still takes place at t = T). Argue that prices will increase at t = 0 and that, in particular, the rate of inflation between T-1 and T will be less than $1 + \mu$.

II – Questions *(30%)*

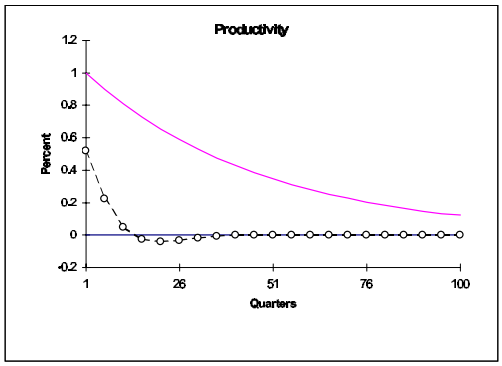
Please propose a structured answer to each question, with as much economic content as possible. Please define the main terms and use math if needed.

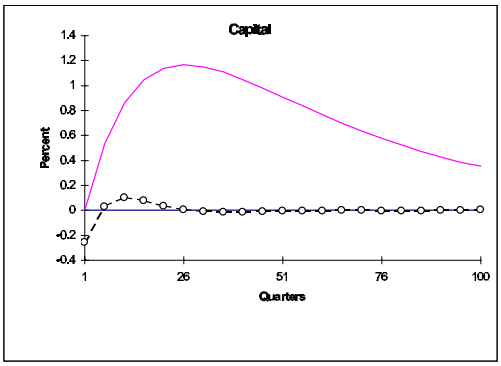
1. The Lucas critique.
2. Capital income taxation and Ramsey equilibria.
3. Ricardian equivalence

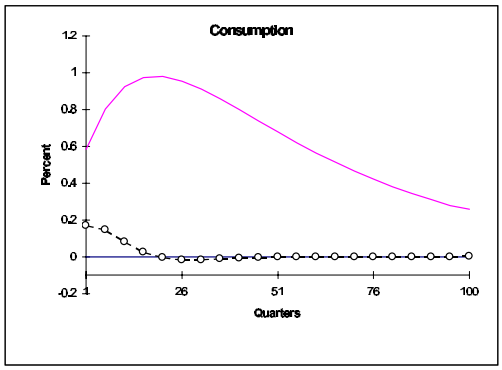
III – Text Discussion *(30%)*

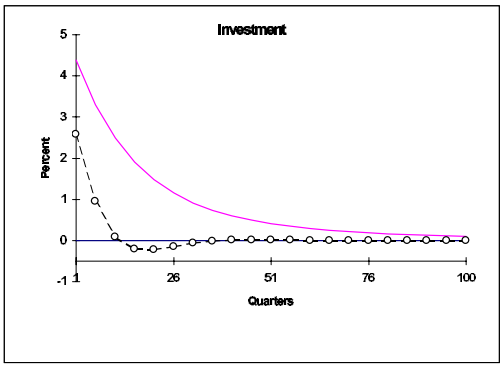
The two following figures are taken from King and Rebelo's Handbook of Macro chapter on real business cycles and from Backus, Kehoe and Kydland's chapter of the Cooley's Frontier of Business Cycle volume that concerns International Business Cycles. Present the canonical closed economy and two-country RBC models, and explain the pattern of those impulse response functions. What are the main successes/weaknesses of the RBC approach?

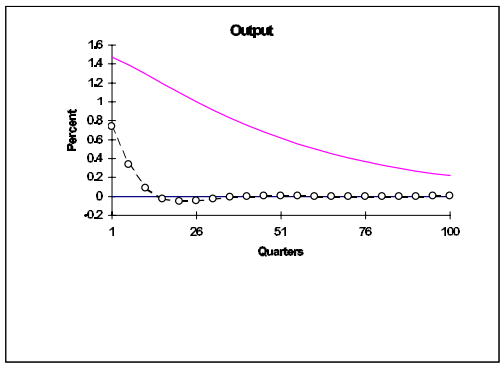
Figure 10
Comparative dynamics to more persistent productivity shock

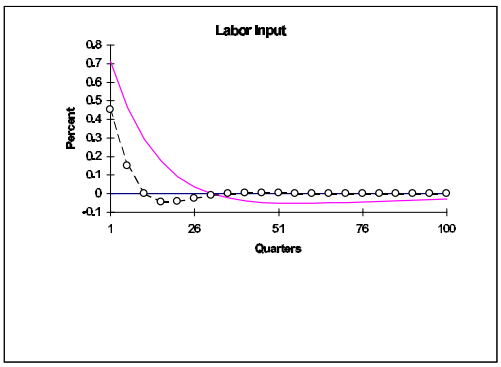


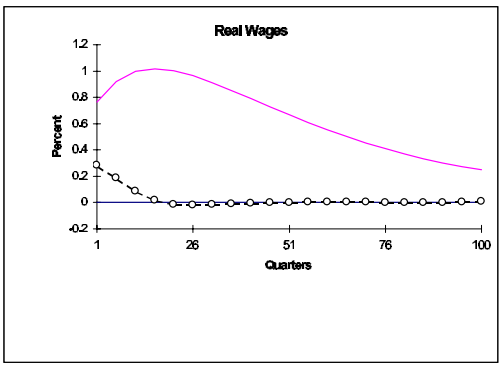


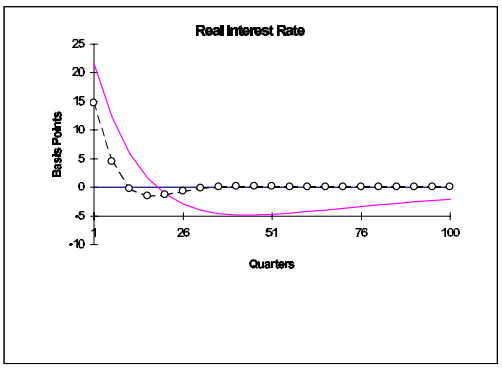












Note: Circled lines are impulse responses that have been filtered with the Hodrick-Prescott filter.