

Quiz 2

Macroeconomic Analysis

ECON7040

June 1, 2021

Instructions

You must submit to Turnitin the questions and answers to this Quiz, including graphs and tables, when necessary. You can use this *tex* file to fill in your answers <https://www.overleaf.com/read/pypqgcgrrbfw>. The answers must contain a list of references used in the analysis/discussion of your arguments. There is no page limit. However, brevity and clarity will be valued and excessively long and unclear answers will be penalized. *Collaboration, not plagiarism, is encouraged. You must write the names of the students you collaborated with.* **Deadline for submission: June 8, 2021, 5:00 PM, Brisbane time.**

Short Questions and Answers (50 marks total)

Choose and answer **ONLY 5** of the following questions.

1. (10 marks) Suppose that the production process of cellphones can be described by the following production technology:

$$Y_t = A_t K_t^\alpha N_t^{1-\alpha},$$

in which Y_t is the number of cellphones produced at time t , A_t is the total factor productivity in producing Y_t , K_t is the amount of physical capital used in production, N_t is the number of hours worked by employees in the cellphone industry, and α is a parameter that measures the importance of capital in production. Suppose that firms in the cellphone industry engage in perfectly competitive markets (for goods and inputs), taking the price of cellphones (P_t), r_t is the cost of capital, and the wage rate w as given. Use the firm's profit maximising condition propose a way to measure α using observed data. This is, express α as a function of P_t , W_t , Y_t , N_t , making sure that this expression is easily measurable using national account data. Explain the process and the meaning.

2. (10 marks) Assuming Cobb-Douglas production technology, we have that total factor productivity (A) can be measured as $A_t = Y_t/(K_t^\alpha N_t^{1-\alpha})$. Provide two arguments that invalidate this formula as a good proxy for total factor productivity. Be explicit about the potential bias and discuss its implications.
3. (10 marks) Write down the Euler equation for consumption and saving decision derived in lecture 6. Assume the utility function is logarithmic ($U(C, N) = \log C + \theta \log(1 - N)$). Combine the resulting Euler equation with the household's budget constraint in period t and $t + 1$. Express C_t as a function of Y_t , Y_{t+1} , the real interest rate (r) and β the discount factor (patience). Explain why and how consumption at time t depends on future income (Y_{t+1}). Is today's consumption more responsive to income at time t or to income at time $t + 1$? Explain.
4. (5 marks) Explain why in our New-Keynesian model, equilibrium output (Y) and employment (N) are demand-determined. What is the key parameter driving this result? Explain.
5. (5 marks) What do the results in Francis et al. (2014) "*A Flexible Finite-Horizon Alternative to Long-Run Restrictions with an Application to Technology Shocks*"¹ (mentioned in lecture 9) imply for selecting a macroeconomic model for the short run? Does the evidence in the paper support the New-Keynesian model or the RBC model? Explain using our set of five graphs for the IS-LM-AD-AS model.
6. (5 marks) Explain the concept of the *Lucas Critique* in macroeconomics and explain how it can make sense of the empirical observations about the Phillips Curve. Use McLeay and Tenreyro (2020) "*Optimal Inflation and the Identification of the Phillips Curve*"² (discussed in lecture 9) to guide and support your answer.
7. (5 marks) Discuss the following statement: "*There is no lower bound on nominal interest rates we should worry about.*" You can use and cite papers discussed in lectures (or others) to guide your answer.
8. (5 marks) Ramey and Zubairy (2018) "*Government Spending Multipliers in Good Times and in Bad: Evidence from US Historical Data*"³ (discussed in lecture 10) show that the government spending multiplier can be substantially larger than 1 (1.5) when the economy is at the ZLB. Explain how our model can or cannot make sense of this result.
9. (5 marks) In "*What Explains the 2007–2009 Drop in Employment?*," Mian and Sufi (2014)⁴ show the importance of the housing net worth channel in

¹Link to the paper: <https://direct.mit.edu/rest/article/96/4/638/58180/A-Flexible-Finite-Horizon-Alternative-to-Long-Run>.

²Link to the published version <https://www.journals.uchicago.edu/doi/abs/10.1086/707181>.

³Link to the published paper <https://www.journals.uchicago.edu/doi/10.1086/696277?mobileUi=0>.

⁴Link to the published paper <https://onlinelibrary.wiley.com/doi/10.3982/ECTA10451>

explaining the evolution of employment in 2007-2009. Explain the results in Figure I of their paper and explain how the mechanism explaining the facts connects or does not connect to the model we studied in lectures.

Long Question (50 marks)

Suppose that the economy is well described by the IS-LM-AD-AS model with partially sticky prices studied in class. In your answers below, keep in mind the consumers' and firms' optimal decisions that give rise to the model and explain how and why agents' decisions change.

1. Suppose that the degree of price flexibility in the economy increases, such that the parameter γ in our price determination equation

$$P_t = \bar{P} + \gamma(Y_t - Y_t^f)$$

changes. Explain how this change affects the effectiveness of fiscal policy. In particular, how do the responses of Y , P , N , r , and w , to a given shock in G , change when γ changes?

2. (10 marks) Suppose that the economy is sitting at its frictionless long-run equilibrium ($Y_t = Y_t^f$). Suddenly, there is an international shock that decreases the average production cost in the economy (\bar{P} decreases). Describe the new short-run equilibrium of the economy. In particular, explain the effect on the output gap, employment level, price level, interest rate, and real wage rate. How different would have been the macroeconomic effects of the shock absent the change in price flexibility γ ?
3. (10 marks) Given the reduction in \bar{P} , the government decides to pursue an unexpected program of fiscal *austerity* in which G_t reduces significantly and G_{t+1} is expected to gradually increase. Explain the rationale of this policy as a way to stabilise output around potential. Discuss the effects of this austerity policy on consumption, investment, output, employment, prices, real interest rate and employment.
4. (10 marks) Now, suppose that, right after the reduction in \bar{P} , and before the implementation of fiscal *austerity*, the real interest rate was near the ZLB ($r_t = i_t - \pi_{t+1}^e$ with $i_t \approx 0$). How would your answer to the previous question change? What are the macroeconomic risks of implementing fiscal austerity in this context? What policy would you have preferred to stabilise the economy around potential output instead?
5. (10 marks) Suppose now that the ZLB binds. Bad news hit the world. A fraction of the labor force is infected with a deadly virus. Besides the decline in labor force, there is an increase in macroeconomic uncertainty, and governments start implementing restrictions on social gathering. These restrictions imply that, given existing inputs K, N , firms will be able to

produce less output Y . Describe the macroeconomic effects of the virus using our five graphs' model.