

Intermediate Macroeconomics

ECON 302

Sample Final Exam : Solutions

Section A - Short Questions [15 points each]

Answer **THREE** of the following five questions. Provide brief, clear answers along with your reasoning. Marks are awarded for the clarity and specificity of your arguments in each of the questions. Relate the context of the questions to any of the models you have studied in the lectures, using graphs and equations to elucidate your answers as necessary. [Hint: To increase your marks, reread the question along with your answer to see if you have answered what the question has asked.]

1. What are “menu costs” and why might they be important?

Answer: *Menu costs are the, generally small, costs of changing prices. Nevertheless even a small cost can be associated with a high degree of price rigidity when firms are imperfectly competitive because in the region of an optimum it makes little difference to a firm’s profits whether it changes its price or not in the face of, say, a demand shift. Furthermore the resulting rigidities can be associated with first-order welfare effects from changes in demand, even though the menu costs are small.*

2. What does Sargent and Wallace’s “Policy Ineffectiveness Proposition” state? What are the crucial assumptions which lead to this proposition holding? What is needed to break the proposition?

Answer: *Sargent & Wallace’s Policy Ineffectiveness Proposition states that only unanticipated policy matters and hence there is no role for stabilization policy. Essentially, in a market clearing model, prices are flexible and any unanticipated shocks means that the market will already have done everything it can do, and so the government cannot do anything else. The crucial assumptions are that there are rational expectations, the Lucas “surprise” supply function, market clearing and symmetric information. To break the proposition, the government must either have superior information, agents must be locked into contracts, or there must be price inertia.*

3. In short-run IS-LM analysis, an increase in the marginal propensity to consume increases income. In models of long-run stationary states, a decrease in the savings ratio reduces income. Is there a contradiction?

Answer: No. An increase in the mpc increases income **today** since consumption rises, and so demand increases leading to an increase in output and income. However, a decrease in the savings ratio, S/Y , is equivalent to an increase in the mpc today. If we national savings is lower (relative to output), then investment falls today and hence, so does the additions to the stock of capital. Thus output **in the future** declines. In essence we borrow from the future more, increasing current income at the cost of future income – and so there is no contradiction.

4. Consider a small open economy with a flexible exchange rate and perfect international capital mobility. What is the effect of an increase in the foreign interest rate on both the level and composition of output in (a) the short run (b) the long run?

Answer: In the Mundell-Fleming model, the increase in foreign interest rates shifts the LM^* out and leads to an exchange rate depreciation. The depreciation in the nominal exchange rate amounts to a real depreciation in the short run and hence it leads to an improvement in competitiveness. This increases net exports and thus we have an increase in aggregate demand. Thus, output, consumption and net exports are higher in the short run, whilst investment is lower (since interest rates are higher).

In the long run, the increase in aggregate demand leads to inflationary pressures and so both inflation (and inflation expectations) rise. Over time, the short run aggregate supply curve would shift up and to the left (as wages and price expectations rise), and so output and consumption would return back to their original levels. However, due to the depreciation of the exchange rate, net exports are higher at the long run equilibrium, whilst investment is lower.

5. How is output divided between capital and labor in the Neoclassical Theory of Distribution? Illustrate in the case of a Cobb-Douglas technology.

Answer: In the neoclassical distribution theory, total income is distributed between capital and labor according to marginal productivities. The first-order conditions for profit maximization for competitive firms imply that $F_K(K,L)=r$ and $F_L(K,L)=w$. Under constant returns to scale, by Euler's theorem, there are zero economic profits:

$$Y = F_K K + F_L L = rK + wL$$

Example: if $Y = K^\alpha L^{1-\alpha}$, then it is easy to show that factor shares are given by $\frac{rK}{Y} = \alpha$ and

$$\frac{wL}{Y} = 1 - \alpha.$$

Section B - Long Questions [55 points]

Answer **ONE** of the following two questions. Marks are awarded for **clarity** and **specificity** of your answers as well as how you **communicate** the thesis of your argument. Be sure to relate the context to any applicable models you have studied in lectures. Use graphs and equations to elucidate your answers as necessary.

6. Does the fact that exchange rates are volatile imply that foreign exchange markets are inefficient? Illustrate your answer by developing a model in which changes in monetary policy can lead to “excessively” large movements in exchange rates.

Answer: No. The answer here relates to something called the Dornbusch model, which shows how exchange rate overshooting occurs in the face of a monetary disturbance. To see this, consider the impact of a monetary expansion within a large open economy. The relevant equations are:

$$IS: Y = C(Y - T) + I(r) + G + NX(\varepsilon(E(r, r^*, E^e), P, P^*), Y^*, Y)$$

$$LM: \frac{M^s}{P} = L(r, Y)$$

Recall that in the short run, prices are sticky, i.e. \bar{P}, \bar{P}^* . Suppose that at time period, T , the monetary authority announces an expansion. A monetary expansion in the short run would lower interest rates in the usual manner and cause output to increase. Incorporating the foreign exchange market, this would mean that the exchange rate is pinned down by uncovered interest rate parity:

$$r^* = r + \frac{\Delta E^e}{E}$$

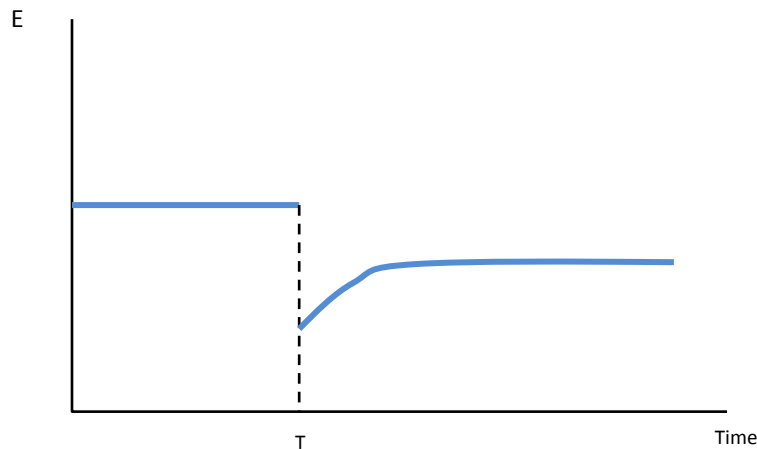
where E is the nominal exchange rate written as the foreign price of domestic currency. If r falls from a monetary expansion, the right hand side of the equation above would fall. The only way UIP can hold is for the exchange rate to immediately depreciate (i.e. E falls). Since exchange rate

expectations will be unchanged in the short run, $\left(\frac{\Delta E^e}{E}\right) \uparrow$ from a fall in E today. The fall in E

amounts to a real depreciation of the exchange rate, which would cause net exports to rise and push output out further than in the usual (closed economy) case.

However, in the long run, output will have risen and we will have inflationary pressures in the economy. Prices will be rising, along with price expectations, and thus the monetary expansion in the long run will impact exchange rate expectations. With rising prices, the home currency will be expected to strengthen and so the exchange rate would be expected to appreciate in the

long run. An expected long run appreciation of the exchange rate would then cause the actual exchange rate to appreciate slowly over time. Hence, what we would observe would be an immediate depreciation of the exchange rate today, where it would overshoot its mark, and then slowly appreciate in the long run as prices gradually adjust over time.



Thus in this model exchange rate volatility may be the consequence of erratic monetary policy, coupled with rigidities in goods or labor markets which lead prices to be slow to adjust to their underlying long-run equilibrium levels.

7. The aim of every government should be to try and achieve zero inflation. Discuss.

Answer: Answers here should incorporate the Barro-Gordon model and outline the essence of the time inconsistency problem related with a zero inflation target. It should start with an expectations augmented Phillips Curve and explain the short run relationship between inflation and unemployment. Good answers would mention Okun's Law in depicting this relationship. From here, it should proceed by outlining the government's objectives in trying to reduce both inflation and unemployment, by explicitly writing out the Loss function and explaining it.

Next, it would obtain the discretionary solution by differentiating the loss function with respect to inflation and showing what level of inflation the government should target. It is then possible to show what inflation expectations are, by assuming rational expectations. Once inflation expectations are determined, it is then possible to calculate the value of the loss under discretion.

After that, students should work out the value of the loss function under the zero inflation target assuming that agents in the economy believe the governments intended target. From there,

students should discuss the time inconsistency problem by showing that the government faces an incentive to renege on the announced zero inflation policy.

Finally, students might go on to discuss possible solutions to the time inconsistency problem by talking about monetary policy rules that the government could follow, reputation and delegation of monetary policy to an independent central bank.

Solutions which show the essence of the Barro-Gordon framework and the time inconsistency issue through diagrams would also suffice.