Intermediate Macroeconomics:
Final Exam Review Questions

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Fall 2015

Note: the final exam is cumulative, but these review questions only cover material presented since the second midterm. You have similar sets of review questions for the first and second midterms, and should consult those when studying older material.

1. Write down the three functions which define money. Which of these is the most important in the real world? Which principal function does money serve in our model? How do we rig the model to get agents to willingly hold money in the model? What is the justification for this?

2. What is the Fisher relationship? Write it down and explain in words why it must hold.

3. Derive the first order condition for household holdings of real money balances. Provide some intuition for this condition.

4. Use this first order condition to explain the signs of the partial derivatives of the money demand function, $M_t = P_t M^d(r_t + \pi_{t+1}^e, Y_t)$.

5. Write down the eight equations which characterize the equilibrium of the neoclassical model augmented to include money. What are the exogenous variables? What are the endogenous variables?

6. Define the classical dichotomy. What does it imply about the abstraction from money that we made in the neoclassical model?

7. What is meant by monetary neutrality? What happens to the endogenous variables after an increase in the money supply in the neoclassical model? What happens to the endogenous variables after an increase in expected inflation in the model?

8. What happens to the nominal endogenous variables ($P_t$ and $i_t$) after a productivity shock?

9. What happens to the nominal endogenous variables after a positive shock to the $Y^d$ curve (e.g. an increase in $A_{t+1}$)?

10. In the data, the price level is countercyclical in the sense of being negatively correlated with output in the short run. The neoclassical model relies on productivity shocks as the primary driver of business cycles. Is the behavior of the price level after productivity shocks in the model consistent with its cyclicality observed in the data?
11. What is the primary driver of inflation in the long run? What does this imply about the relationship between the growth rate of money and the average level of nominal interest rates?

12. Does the money supply being positively correlated with output in the short run necessarily imply that money is non-neutral?

13. Write down the definition of the IS curve. What equations underly it? Which exogenous variables shift it? Is it any different than the $Y_d$ curve?

14. Write down the definition of the LM curve. What equations underly it? Which exogenous variables shift it? Which endogenous variable causes the LM curve to shift?

15. Write down the definition of the AD curve. What equations does it summarize? Which exogenous variables shift it, and in which direction? Does the AD curve have anything to do with nominal rigidity (i.e. price or wage stickiness)?

16. Write down the definition of the AS curve for the neoclassical model. Which equations does it summarize? What is its shape? Which exogenous variables shift it, and in which direction.

17. Graphically, what does it mean for output to be “supply-determined” in the neoclassical model? Explain.

18. Write down the definition of the sticky wage AS curve. Which equations does it summarize? Graphically derive it. Which exogenous variables shift it?

19. Graphically show the effects of an exogenous increase in $M_t$ in the sticky wage model. What happens to each endogenous variable? What is the mechanism through which money is non-neutral?

20. Graphically show the effects of an exogenous shock which shifts the IS curve to the right in the sticky wage model (e.g. an increase in $q$). What happens to the real wage?

21. Graphically show the effects of an exogenous increase in $A_t$ in the sticky wage model. What must be true about the slope of the AD curve for output to react less to the productivity shock than it would in the neoclassical model?

22. Write down the equation for the sticky price AS curve. Describe in words why it looks the way that it does. What does the parameter $\gamma$ measure?

23. Graphically show the effects of an exogenous increase in $M_t$ in the sticky price model. What happens to each endogenous variable? Explain in differences with regard to the sticky wage model.

24. Graphically show the effects of an exogenous increase in a variable which shifts the IS curve to the right in the sticky price model (e.g. an increase in $q$). Explain any differences relative to the sticky wage model.

25. Graphically show the effects of an exogenous increase in $A_t$ in the sticky price model. What happens to each endogenous variable?

26. There is some empirical evidence that total labor hours, $N_t$, decline after an increase in $A_t$. Using the IS-LM-AD-AS curves, explain whether this evidence is consistent with the neoclassical model, the sticky wage Keynesian model, and the sticky price Keynesian model.
27. In the data, real wages are mildly procyclical. Why might this correlation in the data understate the true procyclicality of real wages? Explain.

28. To the extent to which real wages are in fact procyclical, which variant of the Keynesian model – sticky price or sticky wage – provides a better description of demand-driven fluctuations?

29. If $Y_t < Y^f_t$ in the sticky wage model (where $Y^f_t$ is understood to represent the equilibrium level of output if wages were flexible), what must be true about the real wage relative to the real wage which would result in being on both the labor demand and supply curves? What does this imply about pressure on $\bar{W}$ as households and firms can adjust wages? What effect ought this to have on the position of the AS curve as the economy transitions from short run to medium run?

30. If $Y_t < Y^f_t$ in the sticky price model (where $Y^f_t$ is understood to represent the equilibrium level of output if prices were flexible), what must be true about $P_t$ relative to $P^e_t$? What does this imply about pressure on $P^e_t$ to adjust as we transition from the short run to the medium run? What effect ought this to have on the position of the AS curve as the economy transitions from short run to medium run?

31. Briefly explain why monetary policy ought to adjust $M_t$ so as to target $Y_t = Y^f_t$ in the Keynesian model (either variant). What are some drawbacks of using fiscal policy for the same purpose?

32. Conditional on positive shocks to $A_t$, $H_t$, $q$, $G_t$, $G_{t+1}$, and $A_{t+1}$ (considered separately and in isolation), graphically show how the money supply and (hence interest rates) ought to be adjusted so as to implement $Y_t = Y^f_t$ in both the sticky wage model.

33. Conditional on positive shocks to $A_t$, $H_t$, $q$, $G_t$, $G_{t+1}$, and $A_{t+1}$ (considered separately and in isolation), graphically show how the money supply and (hence interest rates) ought to be adjusted so as to implement $Y_t = Y^f_t$ in both the sticky price model.

34. Is price stability a good goal for policy in the context of the sticky wage model? Does your answer depend on the kind of shocks hitting the economy? Explain.

35. In what sense is monetary policy more difficult in the sticky wage model than in the sticky price model.

36. Write down the expression for the Taylor rule. Qualitatively, do the implications for how the Taylor rule suggests nominal interest rates ought to react to different shocks align with our discussion of optimal monetary policy? Explain.

37. Does the Taylor rule provide a good positive description of actual central bank policy in practice?

38. Explain why real interest rates can be negative, but nominal interest rates cannot.

39. Derive the aggregate demand curve if monetary policy is characterized by an interest rate peg, where the nominal interest rate is pegged at a constant value. Explain in words why the AD curve looks this way. What does a policy of a pegged nominal interest rate imply about the extent to which output in equilibrium is demand versus supply determined?
40. We can think about the zero lower bound as imposing a lower bound on the real interest
rate of \( r_t = -\pi_{t+1}^e \). This effectively introduces a flat spot into the LM curve. Draw in a
IS-LM-AD-AS model where the ZLB does not bind.

41. Suppose that the ZLB does bind. Show the effects of an increase in \( A_t \) in the sticky wage
model. What happens to \( N_t \)?

42. Suppose that the ZLB does bind. Show graphically the effects of a reduction in \( A_{t+1} \). Are
the effects of this exogenous change bigger or smaller than they would be if the ZLB did not
bind? Explain.

43. Briefly explain what is meant by the idea of a “deflationary spiral” in the context of the
Keynesian model with a binding ZLB.

44. Show the effects of an increase in expected inflation when the ZLB binds.

45. Write down a couple of summary facts about the Great Recession, including how much
output declined, how persistent that decline was, and how the recession impacted financial
and housing markets.

46. Write down the three stages which I used in class to characterize the Great Recession. Talk
about the timing and central parts of each.

47. Use the IS-LM-AD-AS curves to describe stage 1 of the Great Recession.

48. Use the IS-LM-AD-AS curves to describe stage 2 of the Great Recession.

49. Use the IS-LM-AD-AS curves to describe stage 3 of the Great Recession.

50. In the context of the Keynesian model, do the policy responses to the Great Recession make
sense? Explain.