Macroeconomics Field Exam
August 2023
Department of Economics
UC Berkeley

(3 hours)

Answer Both Parts

Part I (Emi Nakamura): 90 points = 90 minutes

1. **15 points** Robert Lucas wrote a famous paper characterizing the costs of business cycles in a simple model.
   a. **5 points** How did the coefficient of risk aversion affect the gains from macroeconomic stabilization policy in this model?
   b. **5 points** Does the high equity premium provide evidence either for or against Lucas' perspective?
   c. **5 points** Lucas' argument relied on several important assumptions. Which do you think are most likely to be violated?

2. **10 points**
   a. **5 points** Stock and Watson (2012) used a dynamic factor model to compare the Great Recession to earlier recessions. Explain the differences and similarities.
   b. **5 points** If Stock and Watson carried out the same analysis for the Covid recession, do you think they would find the same results? Why or why not?

3. **5 points** Recent work has critiqued standard approaches to *measuring* the labor share. This literature argues that alternative measurement approaches can fundamentally change the time series patterns in the labor share. Briefly describe these arguments.

4. **15 points** Romer and Romer (2004) propose an approach to estimating monetary shocks by controlling for Greenbook forecasts of output and inflation. Describe whether each of the following scenarios could violate their identifying assumptions and why.
   a. **5 points** The Fed systematically lowers interest rates when it expects a recession.
   b. **5 points** The Fed systematically raises interest rates when inflation has been high in the recent past.
   c. **5 points** The FOMC relies on a combination of Greenbook and private sector economic forecasts in making decisions.

5. **25 points** True or false: For each statement, explain whether it is true or false and why (no explanation = no credit).
   a. **5 points** Heterogeneity in the frequency of price change can make inflation respond more sluggishly to monetary shocks.
   b. **5 points** The literature on "information effects" of monetary policy shocks defines information effects as the reaction of the real economy to news about the Fed's future policy actions (i.e., forward guidance).
   c. **5 points** Suppose we estimate government spending shocks as actual government spending minus the IMF forecast of government spending from the previous year. We then run an OLS regression of GDP growth on the government spending shock. This regression avoids endogeneity bias associated with countercyclical fiscal policy.
   d. **5 points** The New Keynesian Phillips curve implies that inflation will increase between periods t-1 and t in response to a demand shock in time t.
   e. **5 points** The recent literature has argued that the cross-sectional Phillips curve slope (as the recent literature has estimated it) will often appear steeper than the aggregate Phillips curve slope estimated in the traditional literature on Phillips curve estimation.

6. **20 points**
    a. **5 points** Write down the linearized consumption Euler equation.
    b. **5 points** What is the effect of a one-period increase in the real interest rate 100 quarters in the future in this model, holding fixed expected consumption 101 quarters in the future. Derive an expression that generates your result.
    c. **5 points** Explain the intuition for the result in part b. Why does consumption react to interest rates 100 quarters in the future in this model?
    d. 5 points One reaction to this "puzzle" in the literature has been to add "discounting" to the consumption Euler equation. Sketch what is meant by this by modifying the equation from part (a).

Part II (Yuriy Gorodnichenko): 90 points = 90 minutes

Short questions (True/False + a brief explanation; explanation determines the grade; 40 minutes):

1. Empirical evidence indicates that fiscal austerity can stimulate output. (4 minutes)

2. Positive co-movement of consumption and output at business cycle frequencies rules out demand-side shocks. (4 minutes)

3. Business cycle frequences correspond to cycles with periods ranging from 6 months to 36 months. (4 minutes)

4. Cholesky ordering imposes restrictions that result in a matrix with contemporaneous responses such that entries in the upper-triangular portion are non-zero. (4 minutes).

5. Residential investment is a lagging, procyclical business cycle indicator (4 minutes).

6. In the U.S. data, aggregate consumption is a random walk (4 minutes).

7. Inflation is always and everywhere a fiscal phenomenon. (4 minutes).

8. Macroeconomic variables are generally stationary (4 minutes).

9. Local projections should not be used to construct impulse responses for serially correlated variables (4 minutes).

10. Business cycle models require sticky prices to generate a short-run decrease in employment in response to a positive TFP shock (4 minutes).

Longer question (50 minutes)

Suppose you wish to estimate the slope of the following Phillps curve:

$$\pi_t = E_t \pi_{t+1} + \kappa X_t + u_t$$

Assume that this equation correctly captures the data generating process and that $u_t = \rho u_{t-1} + e_t$ is a (potentially) serially correlated cost-push shock. Parameters κ and ρ are not known. Please answer the following questions. Explanation determines the grade.

Your officemate A proposes that you run this specification to estimate κ

$$E_t \pi_{t+1} = \pi_t - \kappa X_t + error_t$$

1. How could you implement this specification if you do not observe expectations? What assumptions do you need to make? Discuss pros and cons.

Your officemate B offers you a measure of inflation expectations and suggests that you run an alternative specification:

$$\pi_t - E_t \pi_{t+1} = \kappa X_t + error_t$$

2. Can you consistently estimate κ with OLS? What assumptions are required for consistency? If OLS is not working, what instrument do you need to consistently estimate κ? Discuss pros and cons.

Your officemate C is worried about endogeneity of X_t and suggests this alternative:

$$X_t = \frac{1}{\kappa}(\pi_t - E_t \pi_{t+1}) + error_t$$

3. Would this specification address endogeneity? What assumptions may justify this choice? Discuss pros and cons.

Your officemate D suggest that you can use X_{t-1} and π_{t-1} to construct the following moment conditions and estimate κ with GMM:

$$E_t\left[\left(\pi_t - \pi_{t+1} - \kappa X_t\right)X_{t-1}\right] = 0$$

$$E_t\left[\left(\pi_t - \pi_{t+1} - \kappa X_t\right)\pi_{t-1}\right] = 0$$

4. Would this approach estimate κ consistently? Could you test the validity of this approach? Discuss pros and cons.

Your officemate E suggests that you quasi-difference the Phillips curve and use lags to construct moment conditions for GMM estimation. That is,

$$E_t\left[\left(\pi_t - \pi_{t+1} - \kappa X_t - \rho\left(\pi_{t-1} - \pi_t - \kappa X_{t-1}\right)\right)X_{t-1}\right] = 0$$

$$E_t\left[\left(\pi_t - \pi_{t+1} - \kappa X_t - \rho\left(\pi_{t-1} - \pi_t - \kappa X_{t-1}\right)\right)\pi_{t-1}\right] = 0$$

5. Would this approach estimate κ consistently? Could you test the validity of this approach? Discuss pros and cons.