

Harvard University
Department of Economics

General Examination in Macroeconomic Theory

Fall 2007

PLEASE USE A SEPARATE BLUE BOOK FOR EACH PART AND WRITE THE QUESTION NUMBER ON THE FRONT OF THE BLUE BOOK.

PLEASE PUT YOUR EXAM NUMBER ON EACH BOOK.

PLEASE DO NOT WRITE YOUR NAME ON YOUR BLUE BOOKS.

For those taking the **GENERAL EXAM** in macroeconomic theory:

1. You have **FOUR** hours.
 2. Answer **ALL QUESTIONS** in Parts I, II, III, IV, and V.
 3. Time allotted for each part:
 - I. 60 minutes
 - II. 60 minutes
 - III. 40 minutes
 - IV. 40 minutes
 - V. 40 minutes
-

Problem 2 (40 minutes; True, False, or Partially True): Please explain whether the following statements are True, False, or Partially True. You will be graded on the quality of your *explanation*.

- a. If the variance of $\Delta \ln c$ is constant over time, then $\ln c$ is predicted to be a random walk with drift.
- b. If an investment tax credit is anticipated before the tax credit starts, investment will rise above its steady state level before the tax credit starts. When the tax credit starts, investment will jump up even more.
- c. If a worker retires because of ill health, then her level of consumption should fall discretely at retirement.
- d. An optimal consumption policy will be characterized by a zero correlation between growth in consumption and predictable growth in income.
- e. Consider the following functional operator, B ,

$$g = B(f),$$

which maps functions into functions. Suppose that B has at least one fixed point, such that $B(h) = h$. It follows that B satisfies Blackwell's Sufficiency Conditions.

- f. Suppose that a different functional operator, D , is a contraction mapping. If D has a fixed point, then it is unique.
- g. If a value function satisfies the boundary condition of 'smooth pasting,' then the value function will not have any discontinuities.

Budget deficits and public debt

Suppose initially that the government raises tax revenue with lump-sum taxes, starts with zero public debt, and runs a balanced budget throughout.

a. In the standard neoclassical growth model (Ramsey model), how does the equilibrium change if the government cuts taxes and runs a budget deficit at some future date? Explain the results.

b. Start again from the initial situation, except that the government now starts with a positive real public debt, $B(0) > 0$, rather than $B(0) = 0$. Is the equilibrium different from the initial one? Explain.

c. How do the results in parts (a) and (b) differ in the Blanchard-Weil-type finite-horizon model? What accounts for the difference in results? If people live forever but new people enter the economy over time (say as immigrants), what are the results?

d. Suppose now that each period's real taxes are raised by a proportional tax on that period's consumption, C_t . Redo part b. for this case (in the context of an infinite-horizon, Ramsey model).

e. What happens in part d. if the government varies the consumption tax rate over time?

f. Explain how considerations of strategic debt can enter the analysis.

g. Suppose that inflation occurs at the constant rate π . How would you measure the real budget deficit in this context? How does your answer differ from the standard measure provided by usual national-income accounts?

Part III

For each of the following claims, state whether it is True or False (or Partly True). Explain. Explanation determines grade.

1. In the IS-LM model with a fixed price level, if the Fed adjusts the money supply to hold the interest rate constant, a \$1 increase in both government purchases and taxes increases equilibrium income by exactly \$1, regardless of the interest elasticity of money demand.
2. According to the Sargent-Wallace policy irrelevance result, unexpected changes in monetary policy do not affect real variables such output and unemployment; to influence real variables, policymakers need to change the systematic monetary policy rule.
3. In the Fischer and Taylor contracting models, monetary shocks have real effects that last only as long as the contract length.
4. According to the new Keynesian Phillips curve, such as the Calvo model, the economy suffers a recession whenever the central bank pursues monetary policies to reduce the rate of inflation.
5. In the Caplin-Spulber model of state-dependent price adjustment, menu costs lead to sticky prices at the firm level and monetary neutrality at the aggregate level.
6. The Golosov-Lucas calibrated menu-cost model yield predictions on the frequency and size of price changes that accords with the micro evidence, and it implies that monetary shocks have large, persistent real effects.

Question for fall 2007 macro theory generals

Within the past few months, two related phenomena have prompted concerns about the potential prospect of a downturn in U.S. nonfinancial economic activity:

- (1) a decline in house prices in some areas of the country, and
- (2) prospects of defaults on some home mortgages.

These two developments have also led to

- (3) an unwillingness on the part of banks and other lenders to extend credit, not only for new mortgage loans but for many other purposes as well.

Not surprisingly, these developments have led to widespread discussion of how the U.S. central bank should conduct monetary policy under these circumstances.

Part A

For each of these three developments, considered separately, indicate the behavioral mechanisms (if there are any) that plausibly increase the likelihood of reduced aggregate real economic activity *if monetary policy remains unchanged*.

Part B

For each of these three developments, again considered separately, indicate the behavioral mechanisms (if any) that plausibly alter how monetary policy affects the economy (in other words, that increase or decrease the strength of any given monetary policy action in stimulating aggregate real economic activity).

In each part of your answer, be as specific as you can about the underlying assumptions on which your analysis relies, including assumptions about the economic behavior of households and/or firms and about the structure of monetary policymaking.

Risoban

Open Macroeconomics
Fall-2007

Contagion, Trade, and Financial Frictions

In the contagion literature it is always highlighted that financial frictions are a crucial ingredient to generate co-movement of asset prices. This question is to show that this is not the case.

Assume there are two countries on earth: a and b . We assume that each country in an endowment economy, with one tree, that produces a differentiated good. We assume that the preferences are such that countries trade — which means that they consume both goods — but that they have a home bias in consumption. Preferences are given by

$$\begin{aligned}U_a &= \alpha \ln C_{a,a} + (1 - \alpha) \ln C_{a,b} \\U_b &= (1 - \alpha) \ln C_{b,a} + \alpha \ln C_{b,b}\end{aligned}$$

where

$$\alpha > 1/2,$$

and where $C_{i,j}$ is the consumption of country i of the good produced in country j . α indicates the degree of home bias in consumption. The output of each country is stochastic. Denote (as we did in class) output in state s at time t as $y_a(s, t)$ and $y_b(s, t)$, respectively, and the probability that state s is realized at time t to be $\pi(s, t)$.

1. (8 points) Solve for the Pareto allocation where the weight on country a is one, and the weight on country b is Ψ .
2. (8 points) Solve for the terms of trade between country a and b . In fact, from now on, assume that the numeraire is the good from country a (set its price to one).
3. (8 points) Solve for the competitive equilibrium assuming complete financial markets. Find an expression for the two stock markets. Please, be careful writing the budget constraint. You need Arrow-Debreu assets for all two outputs. Hint: use the fact that the goods from country a have a price of one.
4. (8 points) Show that the stock markets are perfectly correlated.
5. (8 points) Show that the portfolio holdings imply that the Pareto allocation can be achieved by country a holding all its own stock, and country b holding all its own stock; which means that if we do not allow international financial flows welfare is unaffected.
6. (8 points) Why is this happening? One paragraph of intuition is enough.
7. (8 points) What can you say about the completeness of financial markets? Again, one paragraph is enough.