Print your name: _____

Final Examination

Econ 712 Fall 2007
Macro II Page Total = 2

DIRECTIONS: Obey page limits. If a question has multiple parts, indicate exactly where you answer each part. This exam has three (3) sections; be sure to follow the directions for each section. Allocate your time carefully: many students spend too much time on the short answer questions.

1. VERY SHORT ANSWERS:

ANSWER ALL OF THESE. Carefully define and briefly discuss the following terms, carefully contrasting the two termsin each pair. Whenever possible, supplement each verbal definition with **both** a mathematical definition and an example.
Allocated time: 5 minutes each.
Page limit: one page per definition.

- Harrod-Domar model vs. AK model (growth theory)
- rational expectations vs. long-run perfect foresight
- pay-go vs. fully funded (social security)
- random walk vs. white noise
- Okun's Law vs. aggregate supply curve
- stochastic process vs. Markov chain

2. SHORT ANSWERS:

DO A TOTAL OF TWO (2) OF THE FOLLOWING QUESTIONS. ALL QUESTIONS ARE EQUALLY WEIGHTED. Allocated time: 30 minutes each.

Suggested page limit: three pages per question.

SA1. A planner wants to maximize

$$\sum_{t=0}^{\infty} \beta^t \ln(c_t)$$

subject to

$$k_{t+1} = Ak_t^{\alpha} - c_t$$

Derive the Euler equation that will relate consumption levels in adjacent periods along an optimal path.

SA2. What was Sargent's (1971) critique of popular approaches to the estimation of the Phillips curve? Give a *detailed* account of his analysis, relating it explicitly to the Lucas (1976) critique. Be sure to include a discussion of the relevant empirical issues raised by Sargent.

SA3. In the Solow growth model, determine the steady-state effects on Y/AN, Y/N, and Y when the exogenous saving rate (s) undergoes a one-time, permanent decrease. (Here, A measures labor productivity and N is the labor input, so that AN can be thought of as "effective" units of labor, and Y is output.) Illustrate each variable's time path following the change. You may assume that the depreciation rate (δ), the growth rate of A ($\hat{A}$), and the exogenous rate of labor force growth ($\hat{N}$), are positive constants.

3. LONGER ANSWERS:

ALL STUDENTS MUST ANSWER ONE (1) OF THE FOLLOWING QUESTIONS.
Allocated time: 1 hour.

LA1. Consider a very simple two-generation overlapping-generations economy with no money and exogenous endowments. Population growth is at rate $n = 0$. The endowment of the young is $e_{yt} = (1 + m)e_{yt-1}$ and endowment when old (of the same individual) is equal to $(1 + g)e_t$ (where g can be negative). Utility is additive and logarithmic, discounted at rate β. A unit invested at t yields $R_{t+1} > 1$ units of output in the following period. How does an increase in g affect saving? How does an increase in m affect saving? Suppose $dg = dm > 0$: how does this affect saving. Can you connect these observations to any "stylized facts" about saving and growth?

LA2. What difficulties with the Solow growth model were Mankiw, Romer, and Weil trying to address? Explain their theoretical contribution and summarize their empirical results. (Include full long-run comparative statics algebra.)

LA3. Apply the following "term-structure" model of a simple fix-price economy to an analysis of anticipated tax cuts.

$$M = L(i, R, Y) \qquad DY = \phi(Y, Y_{ss}, R, F) \qquad i = R - DR/R$$

Here D is the differential operator, i is the short-rate, R is the coupon rate of return on a perpetuity, Y is real income, Y_{ss} is the steady-state level of real income, M is the exogenous money supply, and F is a "fiscal stance" variable. Give an intuitive explanation of each of the "structural" equations, including an explanation of the sign of each of the partial derivatives. Be sure to think carefully about any deviations of this model from the textbook version, and carefully consider the influence of Y_{ss} on aggregate demand. (NO CREDIT if you ignore this!) Then consider the effects of a one-time, permanent, *anticipated* tax cut in the short run, intermediate run (i.e., dynamic adjustment, including full adjustment dynamics algebra), and long run (including full long-run comparative statics algebra). Note that two sets of algebraic results are required. Include a complete intuitive discussion supported by detailed graphs. You should assume that the combined marginal propensity to spend out of current (Y) plus "permanent" (Y_{ss}) income is less than unity.

LA4. Show how to solve the planners problem in SA1 by value function iteration.

END OF EXAM