



University of Utah
Department of Economics
PhD Qualifying Examination in
Macroeconomics
Tuesday, June 13, 2023
9am – 1:30pm

Please write legibly with a dark pen or pencil and use only the front side of the paper provided.

You may answer these questions in any order, but be sure to label each answer with Part __, Question __.

Be sure to number each page of your answer document, and at the end include the total number of pages.

Any questions about testing protocol can be directed to the proctor.

Qualifying exam Econ 7007, June 2023.

Answer either question 1 or 2. Answer both questions 3 and 4.

1. **(34 pts)** List Kaldor’s original stylized facts, and present a post-Keynesian extension of this list, to include “cyclical stylized facts.” Do either Kaldor’s original stylized facts or an extended list including cyclical stylized facts continue to have relevance? Critically discuss in a short essay.
2. **(34 pts)** Outline—in words, and without mathematical detail—key assumptions feeding into “supermultiplier” theory, and the resulting modeling structures. Does this theory provide a coherent vision for demand-led long run growth? Critically discuss in a short essay.
3. **(33 pts)** Goodwin’s 67 model of cyclical growth features two non-linear differential equations. **(a)** Present the equations, derive Jacobian, present a phase diagram, and briefly describe assumptions, mechanisms and predictions. Specifically, consider (i) an exogenous rise in slope parameter of the real wage Phillips curve; (ii) an exogenous increase in the rate of technological progress, and (iii) an exogenous increase in the rate of labor force growth. **(b)** In full sentences, describe what you see as the key weakness of Goodwin’s 67 model, and succinctly discuss how the literature has sought to address it.
4. **(33 pts)** Consider the following dynamic model:

$$\dot{g} = \alpha(f - g) \tag{1}$$

$$\dot{\pi} = -\beta(u^* - u), \tag{2}$$

where $g = I/K$ is the rate of accumulation (with no depreciation), f is the desired rate of accumulation, π is the profit share, $u \equiv Y/K$ is the income-capital ratio as a proxy for demand, u^* the exogenously given desired rate of utilization, and $\alpha, \beta > 0$ are speed of adjustment parameters. The desired rate of accumulation is increasing in u and π . u clears the goods market at any moment in time: $g = s_\pi \pi u$, where s_π is the savings rate of capitalists ($s_\psi = 0$). **(a)** Analyze the model: Discuss stability in g, π and sketch a phase diagram. **(b)** Critically compare and contrast this model with Goodwinian structures.

Instructions: make sure your handwriting is legible especially since exams will be sent to faculty electronically! For most of the questions below, the answer will require use of formal detail (equations and/or graphs), but which **should be supported** by a brief discussion of the economic intuition.

1. **(25 points)** Consider a Solovian economy with technological progress but without population growth that is on its balanced growth path. Now suppose there is a **one-time** jump in **the number** of workers.
 - (a) at the time of the jump, does output per unit of effective labor rise, fall, or stay the same? Why?
 - (b) after the initial change (if any) in output per unit of effective labor when the new workers appear, is there any further change in output per unit of effective labor? If so, does it rise or fall? Why?
 - (c) once the economy has again reached a balanced growth path, is output per unit of effective labor higher, lower, or the same as it was before the new workers appeared? Why?

2. **(25 points)** End-of-the-world model in the Ramsey Growth Model. Suppose that we know that the world will end at time $T > 0$. How does this modify the TVC? How about the laws of motion of \hat{k} and \hat{c} . What will be the transition path for the economy? **Instructions:** focus on the intuition not on the math.

3. **(25 points)** State three (3) similarities and three (3) differences between the RBC and NKM business cycle theories studied in this class. What are the main policy implications of each of these theories?

4. **(25 points)** The multiplier-accelerator. Consider the following model of income determination. 1) Consumption depends on the previous period's income $C_t = a + bY_{t-1}$. 2) The desired capital stock is proportional to the previous period's output: $K_t^* = cY_{t-1}$. 3) Investment equals the difference between the desired capital stock and the stock inherited from the previous period: $I_t = K_t^* - K_{t-1} = K_t^* - cY_{t-2}$. 4) Government purchases are constant: $G_t = \bar{G}$. 5) Output is given by $Y_t = C_t + I_t + G_t$.
 - (a) Express Y_t in terms of Y_{t-1} , Y_{t-2} and the parameters of the model.
 - (b) Suppose $b = 0.9$ and $c = 0.5$. Suppose there is a one-time disturbance to government purchases; specifically, suppose that $G = \bar{G} + 1$ in period t and is equal to \bar{G} in all other periods. How does this shock affect output over time? **Hint:** Once you get the expressions for ΔY at t , $t + 1$, etc, discuss the economic implication!