University of Utah

Department of Economics

PhD Qualifying Examination in Macroeconomics

Tuesday, June 10, 2025

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 Section __, 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 Macroeconomics I (Econ 7007), June 2025.
Answer either question 1 or 2. Answer both questions 3 and 4.

1. (**34 pts**) Outline—without mathematical detail—the key assumptions underpinning *neo-Kaleckian* theory and the resulting modeling structures. Does this theory offer a coherent vision of demand-led long-run growth? Assess its strengths and weaknesses, and explain how it addresses the utilization controversy. Present your analysis in the form of a short critical essay.

2. (**34 pts**) Outline—without mathematical detail—the key assumptions underpinning *supermultiplier* theory and the resulting modeling structures. Does this theory offer a coherent vision of demand-led long-run growth? Assess its strengths and weaknesses, and explain how it addresses the utilization controversy. Present your analysis in the form of a short critical 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 a short text, describe what you see as the key weaknesses of Goodwin's 67 model, and succinctly discuss how the literature has sought to address it.

4. (**33 pts**) Develop and analyze a dynamic model in continuous time in two state variables: employment rate $e = L/N = Y/(NA)$ and labor share of income $\psi = wL/(PY) = \omega/A$. Assume: (i) that the growth rate of real output is described by a generic function $h(e, \psi)$; (ii) that the growth rate of labor productivity increases in the labor share; and (iii) that the growth rate of the real wage is determined by a real wage Phillips curve. **(a)** State the model equations, derive a Jacobian, and evaluate it at the steady state. **(b)** Sign the steady state Jacobian. Make further assumptions as needed to attain an unambiguously asymptotically stable configuration that is likely to generate cyclical convergence. Explain your choices based on theory and empirics. Draw a phase diagram. **(c)** Consider the effects of labor suppression (i.e., a downward shift of the real wage Phillips curve) in the short and long run. Explain in full sentences; use the phase diagram to illustrate.

U of Utah ECON 7008 Macroeconomics Qualifying Exam, June 10, 2025 **Codrina Rada**

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 the SGM model with the production function: $Y = K + 1000K^{0.2}N^{0.8}$ with $s = 0.15, \delta = 0.10, n = 0.02$.

   (a) Derive the equation for the growth rate of accumulation, that is $\hat{K}$ as a function of $k = K/L$.
   Hint: this should be straightforward as capital accumulation is in a Solow economy a function of available savings in the economy.

   (b) Graph the rate of accumulation as a function of k, with k on the horizontal axis. What do you observe?

   (c) Add a line showing the growth rate of the labor force to your graph. Will this economy ever achieve the steady-state? Explain.

2. **(25 points)** Consider the Ramsey-Cass-Koopmans model, and assume the economy is on its balanced growth path. Assume there is an unexpected decline in ρ the discount rate. Describe the effects on the economy along the transition path and the steady state in terms of c, k, y, r. What would be an equivalent shock in the SGM? What would be the effect of the shock in the SGM?

3. **(25 points)** State three (3) similarities and three (3) differences between the RBC and NKM business cycle theories studies 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!