

AMERICAN UNIVERSITY
Department of Economics

Comprehensive Examination 06A
Advanced Heterodox Theory/Political Economy II

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Directions: This examination has two sections, Macro and Micro. You must answer both sections, and be sure to follow the directions in each section carefully. Each section receives *equal* weight in the overall grading; therefore, you should plan to spend an *equal* amount of time (i.e., about 2 hours) on each *section* (micro and macro). Please make sure that all math is intuitively explained, all diagrams are clearly labeled, and all answers are responsive to the specific questions asked.

MACRO SECTION (2 hours total - 1 hour per question)

Choose any **two (2)** of the following questions. (1 hour each)

1. Discuss the implications of any three (3) of the following theories for what kinds of government policies would best promote long-run growth and/or higher living standards:
 - a. Old neoclassical (Solow) growth model
 - b. Investment-constrained neo-Keynesian/Kaleckian growth model (Foley & Michl version)
 - c. Balance-of-payments constrained growth model (Thirlwall version only)
 - d. Dutt's model of growth determined by both aggregate demand and aggregate supply (with endogenous "animal spirits" and endogenous productivity growth)

For each theory you choose, consider whether a variety of policies (for example, increasing the saving rate, a government fiscal stimulus [or any policy that boosts "animal spirits" of investors], mercantilist trade policies, etc.) would or would not be helpful for increasing the long-run growth rate or long-run real wages. If relevant, be sure to distinguish increases in the long-run equilibrium growth rate from other long-run beneficial effects of a policy (and specify what those long-run gains are). Be as specific as possible about the types of policies and how they would (or would not) work in each theory (you may rely primarily on diagrams; math is optional and should be used only where essential). Also *compare and contrast* the policy implications of the three theories you have chosen. Are there policies that make sense in terms of one model that would be ineffective or even counterproductive according to another model? Why? Discuss.

2. Consider a classical-Marxian growth model characterized by the following equations (in Foley & Michl notation):

$$\begin{aligned}(1) \quad & w = x - (r + \delta)k \\(2) \quad & g_K + \delta = \beta(r + \delta) - (1 - \beta)(1 - \delta) \\(3) \quad & g_K = n \\(4) \quad & n = n_0 - n_1(r + \delta), \quad n_0 > 0, n_1 > 0\end{aligned}$$

where the four endogenous variables are the real wage w , $r + \delta$, $g_K + \delta$, and n (the rate of growth of the labor force). Equation (4) is motivated by the Marxian idea that when the

“capitalist system” (business firms) faces a lower rate of profit, it finds ways to increase the growth of the labor supply (for example, by encouraging immigration, drawing peasants into the modern economy, or putting women to work in factories).

- a. Briefly explain the meaning or motivation for equations (1)-(3). [You do not need to give full mathematical derivations, but you should briefly discuss what each of them assumes.]
 - b. Solve the model mathematically and graphically (use a 2-quadrant graph with w , $r + \delta$, and $g_K + \delta$ on the axes). [You do not need to analyze consumption for this question.] Be sure to indicate the logical order of causality (which variable(s) have to be solved for first?).
 - c. Analyze the effects of a one-time Marx-biased technological change (assuming that it is viable—explain what this means) on the growth rate $g_K + \delta$, profit rate $r + \delta$, profit share π , and real wage w .
 - d. Analyze the effects of an increase in the capitalists’ weight on future consumption (“saving rate”) β on the growth rate $g_K + \delta$, profit rate $r + \delta$, profit share π , and real wage w .
3. Consider a “conflicting claims” model of inflation combined with a neo-Kaleckian model of aggregate demand (in modified Taylor notation). The wage share is defined as $\psi = wb/P$, where w is the nominal wage rate, $b = N/X$ is the labor coefficient (labor per unit of output), and P is the price level. Also, π is the profit share and $\psi + \pi = 1$. Wage- and price-setting behavior are both sensitive to demand conditions in the economy, as reflected in the utilization rate $u = X/K$, as well as to deviations of the wage share from the target levels:

$$\hat{w} = \phi(\psi_w - \psi) + \lambda u \quad \text{and} \quad \hat{P} = \theta(\psi - \psi_f) + \eta u,$$

where ψ_w and ψ_f are the workers’ and firms’ targets for the wage share, respectively, and all parameters (ϕ , λ , θ , η) are positive. In addition, there is labor productivity growth at the rate $\varepsilon = \hat{X} - \hat{N} = -\hat{b} > 0$, and ε is assumed to be exogenous. On the aggregate demand side, the economy is closed (no trade) and has a fiscal deficit (measured in proportion to the capital stock) of γ_g . Savings are at a *uniform* (equal) rate s out of all income (wages or profits), so that the saving function can be written as $g^s = su$. The investment function depends on the profit rate: $g = g_0 + \alpha r$, where r is the profit rate and $r = \pi u$. Answer the following questions:

- a. Solve the “conflicting claims” part of the model for the equilibrium (steady-state) wage share, $\bar{\psi}$, as a function of the utilization rate u , and determine its slope. Explain intuitively what makes it more likely that this “distributive curve” (DC) will slope upward or downward (interpret in terms of the relevant parameter values).
- b. Solve the aggregate demand side of the model for the “effective demand” (ED) or “output response” function for this economy, and determine its slope (sign of $du/d\psi$). Be sure to find the goods-market stability condition. Is this economy stagnationist or exhilarationist, or can it be either? Define your terms and discuss your result.
- c. Now combine the two curves you obtained in parts a. and b., and analyze (*graphically*) the conditions on the slopes of the two curves for the economy to be stable or unstable, assuming that the demand/output adjustment is instantaneous but the wage/price (distributional) adjustment is slow and gradual. Be sure to show *only* cases that are *possible*, given the model *as specified here* (points will be deducted for showing cases that are not

- possible under the assumptions stated above). What is the intuition for the unstable cases, if there are any that are possible?
- d. Analyze the effects of a fiscal stimulus (increase in the budget deficit γ_g) on the steady-state equilibrium values of $\bar{\psi}$ and \bar{u} , and show (graphically) the dynamics of adjustment (in all of the *possible stable* cases; do *not* illustrate unstable or impossible cases). Explain the adjustments intuitively.
 - e. What are the effects of the fiscal stimulus on inflation (\hat{P}), and how do these depend on the slope of the DC curve? Explain the intuition briefly.

MICRO SECTION (2 hours total - 1 hour per part)

This section has 2 parts, A and B. Choose one (1) question in *each* part for a total of two (2) questions.

Part A – Choose one (1) question (1 hour)

1. Chris and Pat are trying to share 100 units of kid-love (play time, say) and 100 units of equity flow weekly. Chris also has an income of \$400 per week, while Pat has \$200. These are all exogenously determined.

Chris' utility function is: $U_c = 400 + KL + .5 E$

Pat's is: $U_p = 200 + 3.5 KL + .5E$

In the case of divorce, Chris gets to keep the equity flow with a probability of .8 (.2 for Pat), and Pat gets to keep the kid-love with a probability of .8 (.2 for Chris).

- a. What is the threat point?
- b. In this model, what explains the relative threat points (with divorce threat)? Assets? Preferences? Norms?
- c. With a 50-50 split of both assets, what are the utilities of the players? Is this efficient? Explain.
- d. Draw the threat point and utility space (from the functions). Put U_c on the horizontal axis.
- e. According to the Nash (cooperative) bargaining solution, what are the utilities? How are the assets shared?
- f. Without solving formally, suggest what might happen to the solution if Pat were altruistic (but Chris not). Illustrate the possible outcome graphically.
- g. Again without solving formally, what might happen if social norms precluded Chris from consuming kid-love. Illustrate the possible outcome graphically.

2. Contingent Renewal and Firm Behavior:

In a firm:

$\pi = pQ(e,N) - W$, where W is the sum of w for all workers, or Nw .

Workers' discounted utility of work is:

$$V = \frac{aw - b}{1 - e}$$

Once the employer chooses w^* , employees choose e^* .

- Find e^* in terms of w^* , i.e. maximize V with respect to e . Graph the function $e = e(w)$.
- Set $p = 1$. Maximize profit subject to the workers' effort function, choosing both N and w . Explain these FOCs. Solve for the w^* which allows both conditions to hold, given the workers' best response function e^* .
- If, as George Akerlof suggests, worker preferences are endogenous to working conditions, how might that affect the equilibrium? Graph the impact on $e = e(w)$.
- How does this outcome differ from the outcome of wage determination in the simple neo-classical model? What assumptions of political economists produce the differences in outcome? What are the economic implications of the differences in outcomes?

3. Answer the following questions concerning the below Hawk-Dove Game:

		<u>Player 2</u>	
		Hawk	Dove
<u>Player 1</u>	Hawk	$\frac{1}{2}(v-c)$	v
	Dove	0	$v/2$

- Find the mixed-strategy Nash equilibrium p^* in the 2-player model above. (Payoffs are symmetrical. Those shown are for the row player.)
- Now, consider a *population* that consists of two groups (call them x and y , but they could be "hawk" and "dove") which have distinct characteristics and norms (the characteristics are referred to as "strategies"). Payoff functions to the strategies of x and y are:

$$b_x(p) = p\Pi(x,x) + (1-p)\Pi(x,y) \quad \text{and}$$

$$b_y(p) = p\Pi(y,x) + (1-p)\Pi(y,y),$$

where p is the share of the population who are “x’s” and $\Pi(\cdot)$ defines the payoff to the strategic interaction specified. Is either strategy ESS? What does this mean?

- c. What will be the equilibrium (p, p^*) in the population?
- d. What is the relation between the p^* in part a. and the p^* in part c? Are they the same equilibrium? Different? Explain.
- e. Suppose that, initially, the two populations (hawks and doves) are separate, but then a small number of Hawks invade a population of Doves and multiply as in the replicator equation

$$\Delta p = p' - p = \alpha p(1 - p)\beta(b_x - b_y)$$

Explain the conditions under which a superior strategy x ($b_x > b_y$) (i.e. playing Hawk) will *not* displace the altruistic Dove behavior in the population.

Part B – Choose one (1) question (1 hour)

1. Mainstream economics has a long tradition of treating preferences as exogenous. However, over the past thirty years economists have explored several models of endogenous preferences.
 - a. Briefly explain the standard justification for treating preferences as exogenous.
 - b. Briefly explain why critics argue we should treat preferences as endogenous.
 - c. Define the preference fulfillment and the preference development effects.
 - d. In a purposeful preference molding (or informed self-development) model of endogenous preferences, what are (1) the actors in the economy, and (2) the analyst assumed to know about the preference fulfillment and preference development effects?
 - e. What are the implications of a purposeful preference molding model of endogenous preferences for the three fundamental theorems of welfare economics? Briefly explain.
 - f. In a myopic habit formation model of endogenous preferences, what are (1) the actors in the economy, and (2) the analyst assumed to know about the preference fulfillment and preference development effects?
 - g. What are the implications of a myopic habit formation model of endogenous preferences for the three fundamental theorems of welfare economics? Briefly explain.
 - h. In a purposeful preference molding model of endogenous preferences, what are the implications if users of a good are charged less than the true social opportunity cost of producing it? Briefly explain.
2. Michael Reich used the following model to analyze the logic of wage discrimination:

$$\Pi = p f(LD) - w_B - w_W$$

where:

Π is profit, p is the price of output and is constant,

w_B is the black wage rate set in the labor market, w_W is the white wage rate, which the employer can raise above w_B if she so chooses

f is the production function with $f' > 0$

Labor Done, $LD = g(L, BP)$ with $\partial g / \partial L > 0$ and $\partial g / \partial BP < 0$

Where employment, $L = L_W + L_B$, is the sum of white and black employment

The wage ratio, $R_w = w_w / w_B$

The employment ratio, $R_q = L_w / L_B$

Employer bargaining power, $BP = h(R_w, R_q)$

with $\partial h / \partial R_w = 0$ at $R_w = 1$ and $\partial h / \partial R_w < 0$ for $R_w > 1$

Substituting and using the identity $L = L_w + L_B = (R_q + 1)L_B$, the profit function can be rewritten:

$$\Pi = p f [g(L, h(R_w, R_q))] - (R_w R_q + 1) w_B L_B$$

- a. Derive the first order condition for profit maximization with respect to R_w .
 - b. Carefully explain what this first order condition does or does not imply about wage discrimination.
 - c. Carefully explain who wins and who loses -- absolutely, not relatively -- in Reich's model when there is wage discrimination: (1) the employer, (2) Black workers, (3) White workers?
 - d. Neoclassical theorists have long claimed that divide and conquer theories of racial discrimination assume collusion on the part of employers and therefore do not apply if labor markets are competitive. Explain how this criticism does or does not apply to Reich's model.
 - e. What does Reich's analysis imply about the claim that affirmative action programs are unnecessary because competition for profits will eventually eliminate racial discrimination by employers?
3. John Roemer proved that if the rate of profit in the economy, r , is high enough *any* retrogressive, capital-saving, labor-using technical change will be viable.
- a. Define (i) retrogressive technical change, (ii) capital-saving, labor-using technical change, and (iii) viable technical change.
 - b. Provide the intuition for Roemer's result.
 - c. Carefully state the Okishio theorem for an economy where the socio-technology matrix for the economy $\mathbf{A}^* = [\mathbf{A} + \mathbf{bL}]$ is non-negative, indecomposable, and productive.
 - d. Explain the intuition for the Marxist theory that, as capitalists eventually substituted more and more capital for living labor, the rate of profit would eventually fall. Then explain the implication of Okishio's theorem for this theory.
 - e. If the viable technical change is retrogressive, what do we know about $\mathbf{V}'\mathbf{b}$ compared to $\mathbf{V}\mathbf{b}$? Briefly explain.
 - f. What does this imply about the fraction of each hour workers are working to produce their own real wage, and therefore the fraction of each hour they are working to produce profits for their employers?
 - g. In which case, how is it possible for the rate of profit of employers to rise when they implement a viable, retrogressive, capital-saving, labor-using technical change?