

Political Economy Ph.D. Exam Questions

1. What does Marx mean by "capital" and how does that differ from the way the term is used by mainstream economists?
  - i. What are the different formulae he uses in his discussion of the "circulation of money as capital" and how does he distinguish these from the "circulation of money as mere money"?
  - ii. What are contradictions of the general formula for capital, and how does the buying and selling of labor power enter into this formula?

7004 QUALIFYING EXAM IN POLITICAL ECONOMY 2003

HANS G. EHRBAR

years. This gives the following economy

(3)

From: \ Into:	Agriculture	Manuf.	Households	Total
Agriculture:	25 bsh wheat	20 bsh wheat	55 bsh wheat	100 bsh wheat
Manuf.:	14 yd cloth	6 yd cloth	30 yd cloth	50 yd cloth
Households:	80 yr labor	180 yr labor	40 yr labor	300 yr labor
Output:	100 bsh wheat	50 yd cloth	300 yr labor	

In this table, the row sums are equal to the gross output vector. Construct  $A$ ,  $x$ , and  $p^T$  for this economy. Show that  $Ax = x$ , i.e., this economy has a zero net product, and that  $p^T A = p^T$ , i.e., this economy has zero profits.

(v) Verify that the matrix  $A \text{diag}(x)$  gives the numbers in table (3) (except for the row sums and column sums).

(vi) The following table describes the economy not in physical quantities but in monetary terms:

(4)

From: \ Into:	Agriculture	Manuf.	Households	Total
Agriculture:	\$ 50 wheat	\$ 40 wheat	\$ 110 wheat	\$ 200 wheat
Manuf.:	\$ 70 cloth	\$ 30 cloth	\$ 150 cloth	\$ 250 cloth
Households:	\$ 80 labor	\$ 180 labor	\$ 40 labor	\$ 300 labor
Output:	\$ 200 wheat	\$ 250 cloth	\$ 300 labor	\$ 750 total

This is the input-output table of the economy as it is usually published together with the National Income data. It allows the comparison of different items in the same column, something that was not possible with the physical input-output table, where each row had a different denomination. Answer the following questions: Does manufacturing spend more on manufacturing inputs or on agricultural inputs? Which percentage of total household income is spent on manufacturing goods? Both the row sums and the column sums of this economy give the gross output vector.

(vii) Show that the coefficient matrix in the above table (leaving out the row sums and column sums) can be computed as the matrix product  $\text{diag}(p)A \text{diag}(x)$ .

Problem 2. [1] works with the following simple model of a farm and a bakery:

$$(5) \quad a \text{ corn} \oplus 0 \text{ bread} \oplus 1 \text{ labor} \triangleright 1 \text{ corn}$$

$$(6) \quad b \text{ corn} \oplus 0 \text{ bread} \oplus c \text{ labor} \triangleright 1 \text{ bread}$$

where  $a > 0$  and  $b > 0$ .

\* a. (2 points) Write down the input coefficient matrix  $A$  and the labor coefficient vector  $\ell^T$ .

\* b. (3 points) What must the vector of gross outputs  $x$  be so that the net product is one loaf of bread?

\* c. (3 points) Show that this economy is "productive," i.e., it is able to produce a strictly positive net product  $y \gg 0$  if and only if  $a < 1$ . Don't use the conditions for productivity given later in this Problem, but compute the  $x$  for a particular  $y \gg 0$ , for instance you may choose is  $y^T = \begin{bmatrix} e \\ 1 \end{bmatrix}$  where  $e > 0$ , and see what is necessary to make  $x \geq 0$ . (Here the symbol  $\gg$  indicates that both components of the vector  $y$  must be positive. By the way, note that this condition does not check whether the net product is big enough for the workers to live on.)

\* d. (1 points) Now introduce the wage bundle

$$(7) \quad b = \begin{bmatrix} 0 \\ w \end{bmatrix},$$

e b. This example shows that contrary to the labor theory of value, there can be a positive rate of profit and positive prices in a totally automated economy. What would a Marxist say about this?

Problem 6. Prove the following implication of the neoclassical constant-returns-to-scale production function: If society follows the maxim "invest your profits, save your wages," it will converge to the golden rule growth path. Here is what you have to do: establish the differential equation for  $k$  in the given scenario, and show that  $\dot{k} > 0$  if  $k < k^{**}$ , and  $\dot{k} < 0$  if  $k > k^{**}$ , where  $k^{**}$  denotes the "golden rule", i.e., it is the capital/labor ratio at which the profit rate is equal to the growth rate of the labor force, i.e., at which  $f'(k^{**}) = \rho$ .

Problem 7. A small African country has population growth rate of 2 percent per year, i.e.,  $\frac{\dot{N}}{N} = 0.02$ , and a Cobb-Douglas production function involving labor and capital with  $\alpha = 1/2$ :  $Q = \sqrt{KN}$ . The IMF is willing to give this country as development aid all the capital stock it needs. The country does not have to pay for the initial capital itself, but it has to re-invest enough so that this capital stock will grow at least at 2 percent per year (so that capital stock per person remains constant over time). Show that, in order to maximize its per capita consumption, this country should request a capital stock of  $625N$  where  $N$  is its population. Show that at this capital stock the rate of profit is 0.02, i.e., the country is at the golden-rule growth path.

Problem 8. What is the epistemic fallacy? What are its implications for science and for philosophy?

Problem 9. What is the central paradox of science and how does Bhaskar propose to deal with it?

Problem 10. Both Bhaskar and Marx are critical of idealism, but Bhaskar is also critical of empiricism. Define empiricism and explain why Bhaskar is critical of it. What is Marx's stance on empiricism?

Problem 11. Which three inter-related mistakes are buried in the concept of the "empirical world."?

Problem 12. Explain the difference between philosophical and scientific ontology.

Problem 13. What is empiricism? Bhaskar's Realist Theory of Science gives an Achilles-heel critique of empiricism. Explain.

Problem 14. How can experimental activity be used to prove that constant conjunctions of events are neither necessary nor sufficient for causal laws?

Problem 15. According to transcendental realism, explanation and prediction are not the same thing. What is the role of prediction in science?

Problem 16. Describe in detail the three steps in scientific discovery.

Problem 17. Illustrate what it means that society does not consist of individuals but of relations.

Problem 18. Is society something real, or does it only exist in the thoughts of its individual members?

Problem 19. What is methodological individualism? Give arguments for and against it.

Problem 20. Describe the four models of the society/individual connection, and give their shortcomings and advantages.