Political Economy (7004) Ph.D. Qualifying Examination Questions - 2010

Answer two of the following three questions:

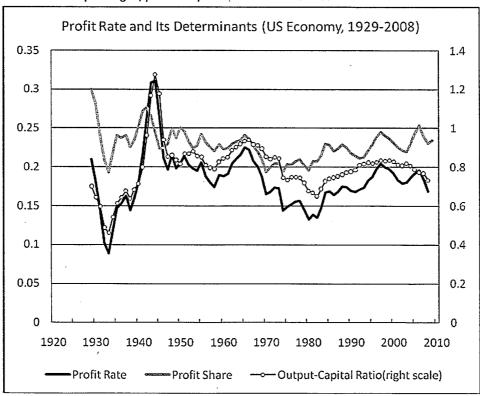
- 1. Using a game theoretic framework discuss the viability of a "spontaneous order", and how that relates to whether the market is embedded or disembedded in the sense of Polanyi?
- 2. What are the historical preconditions of self-regulating markets? In your answer, make sure to compare and contrast Polanyi's "fictitious commodities" and Marx's notion of "commodification" of labor.
- 3. Discuss the conceptual foundations of Marx's labor theory of value as an explanation of the origin of property income.

Qualifier Exam Political Economy, Part II, Summer 2010

Question 1

The profit rate is a major determinant of capital accumulation, which in turn helps to explain successes and failures of capitalist institutional structures. Using the relevant Marxist and Post-Keynesian literature and taking into account the information presented in the figure below, explain and analyze the rises and falls of successive institutional structures of the US capitalist economy from WWII to the present. For each historical phase of post-WWII US capitalist development, please consider the relative strengths and weaknesses of several different Marxist/post-Keynesian theoretical approaches that are relevant for the analysis, and discuss to what extent any or all of these approaches are appropriate for our understanding of the historical phase being considered.

The US capitalist economy is likely to have entered into another structural crisis. Discuss the underlying causes of the current crisis. In your opinion, what is the likelihood for the US capitalism to recover from the current crisis and resume vigorous capital accumulation? What conditions are required for vigorous capital accumulation to resume? What factors could contribute to a prolonged, potentially more destructive crisis?



- 2. Climate change that results from greenhouse gas emissions associated with human economic activities is now threatening to destroy the entire global ecological system. Consider the following three political/intellectual positions regarding the relationship between capitalism and climate change. For each of the three positions, using the relevant Marxist, world system, environmental, or climate change literature, first make as strong a case as possible for the position and then criticize the position as effectively as possible:
- (a) Climate change is one of the greatest market failures in history. Nevertheless, capitalism represents the best possible economic system that is available to address climate change and other environmental problems. This is because capitalism has proved to be better than other systems (such as socialism) in promoting technological innovation and eco-efficiency. The technologies required to address climate change are either already available or can be made available in the near future. All that is required is for the world's governments and businesses to recognize the importance and urgency of the problem and design appropriate legal and institutional solutions (such as emission reduction commitments, cap-and-trade mechanism, or carbon tax). Businesses would then be properly motivated to achieve economic growth on a decarbonized and ecologically sustainable basis.
- (b) Dangerous climate change results from human energy consumption. Despite the promise of technological progress, it is difficult to conceive that the world economy can free itself from its dependence on fossil fuels. Therefore, it is highly unlikely that economic growth can be decoupled from fossil fuels consumption and greenhouse gas emissions. Climate stabilization thus requires nothing short of a steady state economy with zero or negative growth. However, a steady state economy does not need to be incompatible with capitalism (based on private property and the market). In fact, historical socialism had turned out to be far more damaging to the environment than capitalism. To achieve a steady state economy, all that is required is for people to give up their incessant and irrational desire for material consumption and start to pursue intrinsic quality of life.
- (c) Capitalism inevitably leads to endless capital accumulation and cannot survive without economic growth. Economic growth inevitably leads to growing consumption of energy and resources as well as environmental impact (including climate change). It is therefore a futile exercise trying to achieve climate stabilization without rejecting capitalism. Despite the failure of historical socialism, only a socialist system which is based on democratic control over the economy can provide the best hope for climate stabilization and ecological sustainability.

There are 72 points possible on this exam, 36 points each for Prof. Lozada's questions and Prof. Kiefer's questions. However, Prof. Lozada's questions are almost equally weighted (they are worth 11 points, 13 points, and 12 points), while Prof. Kiefer's required question is worth 18 points, which is twice as much as his optional questions.

There are three sections on this exam:

- In the first section there are three questions; you should work all of them. The first is worth 11 points; the second is worth 13 points; and the last one is worth 18 points.
- In the second section there are two questions; you should work one of them. Each is worth 12 points.
- In the third section there are three questions; you should work two of them. Each is worth 9 points.

You have 4 hours and 30 minutes (that is, until 1:30 PM) to finish this test. This gives you about 45 minutes per question. Good luck.

Section 1. Answer all of the following three questions.

- 1. [11 points] Tell me everything you know about:
 - (a) quasiconcavity; and
 - (b) why it is important in consumer theory (you do not have to say anything about producer theory).

The essay you write should be understandable to an undergraduate student who has had no mathematics beyond the first year of calculus; so you will certainly have to define any terms you use which I taught this year.

You do not have to discuss quasiconvexity, nor dual functions (so there are two reasons why you do not have to discuss the result that "the indirect utility function $v(\mathbf{p}, m)$ is quasiconvex in \mathbf{p} ").

2. [13 points, divided as: 3 points for (a), (e), and (f) taken together; 3 points for (b) and (c) taken together; 3 points for (d); 4 points for (g).]

In an exam from a previous year, I (Prof. Lozada) asked the following question:

Consider a two-person, two-commodity economy in which " x_{ij} " represents the amount of commodity i belonging to person j. Suppose the utility function of person 1 is

 $\ln x_{11} + \ln x_{21}$

and the utility function of person 2 is

 $\ln x_{12} + \ln x_{22} .$

Suppose the initial endowments of persons 1 and 2 are $\omega_1 = (1,1)$ and $\omega_2 = (2,1)$, respectively. Find the core of this economy.

I have attached the two-page handwritten answer to this question right after page 9 of your exam. Please look at those two pages.

(a) After the old answer sheets are two pages with computer-drawn graphs. You should ignore all of the typewritten computer commands on this page, which are written in a language I do not

expect you to be familiar with. Find Fig. 1. Its horizontal axis is, as labeled, $U^1 = \ln(x_{11} \cdot \frac{2}{3}x_{11})$, and its vertical axis is, as labeled, $U^2 = \ln[(3-x_{11}) \cdot (2-\frac{2}{3}x_{11})]$. As indicated, the graph shows what happens in this (U^1, U^2) space as x_{11} goes from $\sqrt{6}/2$ to $3-\sqrt{3}$, in other words, as x_{11} goes approximately from 1.23 to 1.27. Give an economic interpretation of this curve in (U^1, U^2) space. Hint 1: I have never shown you a graph in (U^1, U^2) space before, so I am not asking you to remember something, I am asking you to interpret something which is new to you. Hint 2: Look back to the old answer sheet, especially the bottom of its second page, for help.

(b) All the remaining parts below pertain to finding the core of the "2-replica" of the above economy, in other words, finding the core of the economy with two people who are identical to Person 1 above and two people who are identical to Person 2 above.

To begin, explain why one of the first steps in finding the core of the 2-replica might be to solve

$$\max[\alpha \ln(x_{11}.x_{21}) + (1-\alpha) \ln(x_{12}.x_{22})]$$

for $\alpha \in [0,1]$ such that

$$2x_{11} + x_{12} = 4$$
 and $2x_{21} + x_{22} = 3$.

Read part (c) before you answer part (b).

(c) Next, explain why one of the first steps in finding the core of the 2-replica might be to solve

$$\max \left[\alpha \ln(x_{11} x_{21}) + (1-\alpha) \ln(x_{12} x_{22}) \right]$$

for $\alpha \in [0,1]$ such that

$$x_{11} + 2x_{12} = 5$$
 and $x_{21} + 2x_{22} = 3$.

(d) Solve the problem in part (b). Hint: one way of expressing the answer is

$$x_{11} = 2\alpha$$

$$x_{12} = 4 - 4\alpha$$

$$x_{21} = \frac{3}{2}\alpha$$

$$x_{22} = 3 - 3\alpha$$

Next, argue that not all $\alpha \in [0, 1]$ are economically relevant, and that the economically relevant α 's are

$$\alpha \in \left[\frac{1}{\sqrt{3}}, 1 - \frac{1}{\sqrt{6}}\right] \approx [0.59, 1.41].$$

Hint: When I worked the last sentence of this part, one of my intermediate steps was to solve $6\alpha^2 - 12\alpha + 5 > 0$. In solving that it was helpful to remember that if $ax^2 + bx + c = 0$ then $x = (-b \pm \sqrt{b^2 - 4ac})/2a$.

- (e) Find Fig. 2 on the first sheet of computer-drawn graphs. It is related to parts (b) and (d) above. Its horizontal axis is, as labeled, $U^1 = \ln(2\alpha \cdot \frac{3}{2}\alpha)$, and its vertical axis is, as labeled, $U^2 = \ln[(4-4\alpha) \cdot (3-3\alpha)]$. As indicated, the graph shows what happens in this (U^1, U^2) space as α goes from $\frac{1}{\sqrt{3}}$ to $1-\frac{1}{\sqrt{6}}$. Give an economic interpretation of this curve in (U^1, U^2) space.
- (f) Find Fig. 3 on the first sheet of computer-drawn graphs. It is related to part (c) above. Guess what Fig. 3 shows. Hint: I give part of the answer away in the first two sentences of part (g), so you might want to read them before answering.
- (g) Find Fig. 4, on the second sheet of computer-drawn graphs. Fig. 4 just superimposes Figs. 1, 2, and 3. I have indicated what values of x_{11} correspond to two important points in Fig. 4.
 - i. Explain the economic conclusions which come from Fig. 4.
 - ii. draw an Edgeworth Box, as on the second page of the old exam answer;
 - iii. in this Edgeworth Box, show the core of the 2-replica of the economy; and
 - iv. in this Edgeworth Box, show how the core of the 2-replica compares to the core of the original economy; and finally,
 - v. explain why this result (the result of subpart (iv) which you just completed) is just what one would expect.

3. [18 points]

Airbus produces jet planes y by combining capital x_1 and labor x_2 .

(a) Airbus's cost function is

$$c=y\sqrt{w_1\,w_2}\,,$$

where w_1 is the rental rate for capital and w_2 is the wage rate. Explain the difference between the cost function above and the one below:

$$c=w_1x_1+w_2x_2.$$

- (b) What is Airbus's production function? Is it homogeneous of degree 1? Monotonic? Convex? Quasiconcave? Sketch the isocost and isoquant curves; give an interpretation the slopes for this case.
- (c) Suppose that the rental rate for capital is $w_1 = 2$; the wage rate is $w_2 = 2$, and that demand is given by the function

$$p(y) = 8 - y.$$

And, suppose that this market is competitive. What is its equilibrium? What combination of capital and labor would Airbus use?

- (d) Now suppose two firms (Airbus and Boeing) share this market; they behave as a Cournot duopoly. They have identical costs. What is the equilibrium?
- (e) Airbus and Boeing still share the market, but now form a cartel. Suppose that they split the cartel quantity and profits equally. And assume that the cartel and Cournot quantities are the only possibilities. Fill in the payoff matrix.

profit payoffs: (Boeing, Airbus)		Airbus	
		cartel	Cournot
Boeing	cartel		
	Cournot		

(f) Suppose that this game is repeated infinitely many times. Consider the mutual punishment threat:

- play cartel in the first game; thereafter play cartel,
- unless the either rival plays Cournot in any previous game, then play Cournot.

Under what circumstances is the (cartel, cartel) outcome a subgameperfect Nash equilibrium of the infinitely repeated game?

- (g) Finally, suppose that these two firms behave as a Stackelberg duopoly: only one game is played, Airbus chooses his quantity first, and Boeing follows. What is Stackelberg equilibrium?
- (h) Construct a welfare analysis of the cartel, Cournot and Stackelberg equilibriums to determine which is the more efficient market structure. Illustrate your answer. What are the implications of this example for public policy?

Section 2. Answer one of the following two questions.

- 1. [12 points] Suppose a firm produces one output. The output is produced using one purchased input called "x," but production is adversely affected by air pollution, the amount of which is called "d" (for "d irty air"). Let the price of x be "w."
 - (a) How is this firm's purchases of x changed by a change in the amount of air pollution? Find a symbolic answer to this question, then speculate about its sign.
 - (b) How is this firm's profits affected by a change in the amount of air pollution?
- 2. [12 points] Consider a profit-maximizing firm that produces a good which is sold in a competitive market. It is observed that when the price of the output good rises, the firm hires more skilled workers but fewer unskilled workers. Now the unskilled workers unionize and succeed in getting their wages increased. Assume that all other prices remain constant.
 - (a) What will happen to the firm's demand for unskilled workers?
 - (b) What will happen to the firm's supply of output?

Section 3. Answer two of the following three questions.

1. [9 points]

(a)

The postulate of methodological individualism underlies all public choice analysis. In trying to explain governmental actions, we begin by analyzing the behavior of the individuals who make up the government. In a democracy these are the voters, their elected representatives, and appointed bureaucrats. The postulate of methodological individualism has a normative analogue. The actions of government ought to correspond, in some fundamental way, to the preferences of the individuals who these actions effect, the citizens of the state. The postulate of normative individualism underlies much of normative analysis in public choice.

—Dennis Mueller

Explain the term methodological individualism. Discuss its role in neoclassical microeconomics. Give specific examples.

(b)

No one pretends that democracy is perfect.... Indeed, it has been said that democracy is the worst form of government except all those other forms that have been tried from time to time.

-Winston Churchill

Discuss the limitations of normative individualism.

(c) Discuss and evaluate the alternative schools of thought concerning methodology.

2. [9 points] Imagine a 2 by 2 economy. There are two consumers, i = 1 (Robinson) and 2 (Friday); each consumes two goods, leisure x_{1i} and burritos x_{2i} . Their preferences are identical,

$$u(x_{1i}, x_{2i}) = x_{1i} - \frac{(2x_{2i} - 3)^2}{2}$$
.

Their endowments $\omega_i = (\omega_{1i}, \omega_{2i}) = (2, 0)$ are also identical.

Burritos can be produced according to the production function $y_2 = |y_1|$. General equilibrium is described by $x_{1i} = \omega_{1i} + y_{1i}$, $y_{11} + y_{12} = y_1$ and $x_{21} + x_{22} = y_2$. Define the price of leisure as the numeraire, $p_1 = 1$.

- (a) Suppose that Robinson and Friday share burrito profits equally; each has a 50% share in the firm. In perfect competition what is equilibrium price of a burrito and the allocation $(x_{11}, x_{21}, x_{12}, x_{22})$? What are profits?
- (b) Consider a pure monopoly regime for the burrito market, and assume that Robinson receives all profit. Robinson owns the burrito firm. What is equilibrium price of a burrito and the allocation? Now what are profits?
- (c) Consider a reform of the Robinson-monopoly regime in favor of perfect competition. Is this a Pareto improvement?

3. [9 points]

Barbie and Ken consume a private good, coffee x_i , and a public good, poetry G. The utility functions and endowments are of the fixed-proportions form,

Barbie
$$U_b = \min(x_b, G)$$
 $\omega_b = 3$,

Ken
$$U_k = \min(x_k, G)$$
 $\omega_k = 3$.

Endowments are also shown. Each citizen may make a contribution g_i toward the provision of poetry, but such contributions reduce private consumption according to the budget constraint

$$\omega_i = x_i + g_i \,.$$

The private good can be transformed into the public one according to the transformation function

$$x_b + x_k + G - \omega_b - \omega_k = 0.$$

Finally, Barbie and Ken agree on the Benthamite social welfare function,

$$W = U_k + U_b.$$

- (a) Plot reaction curves in $g_k g_b$ space. Show that the Nash equilibrium occurs at $(G, x_b, x_k) = (2, 2, 2)$.
- (b) Add indifference curves to your $g_k g_b$ diagram. Given these endowments, find the Pareto set.
- (c) Show that the Nash Equilibrium is also the Benthamite social optimum, given these endowments. Illustrate your answer in $U_k U_b$ space.

Answer DE Con 7005 Final Exam, Fall 2007

$$U' = \ln x_{11} + \ln x_{21} \quad c_{01} = (1.1)$$

$$U^{2} = \ln x_{12} + \ln x_{22} \quad \omega_{2} = (2.1)$$

To find the core, first and the contract curve (set of Parto Optimal points).

mox
$$\alpha \left(\ln \chi_{11} + \ln \chi_{21} \right) + (1-2) \left(\ln \chi_{12} + \ln \chi_{22} \right)$$
 5. t. $\chi_{11} + \chi_{12} = 3$ $\chi_{21} + \chi_{22} = 2$

$$D = \frac{\alpha}{\chi_{11}} - \frac{1-\alpha}{3-\chi_{11}} \implies \frac{1-\alpha}{3-\chi_{11}} = \frac{\alpha}{\chi_{11}} \implies (1-\alpha)\chi_{11} = 3\alpha - \alpha\chi_{11}$$

$$7_{11} - \alpha\chi_{11} = 3\alpha - \alpha\chi_{11}$$

$$\chi_{11} = 3\alpha$$

$$\chi_{11} = 3\alpha$$

$$\chi_{12} = 3 - \chi_{11} = 3 - 3\alpha$$

$$\frac{1-\alpha}{2-\chi_{21}} = \frac{\alpha}{\chi_{21}}$$

$$(1-\alpha)\chi_{21} = \alpha(2-\chi_{21})$$

$$\lambda_{21} - d \lambda_{21} = 2d - d \lambda_{21}$$

$$\lambda_{21} = 2d$$

$$\lambda_{22} = 2 - \lambda_{21} = 2 - 2d$$

$$= 2(1-d)$$

So this is the contract arre, parametrized by α . On this corre, $U' = \ln x_{11} + \ln x_{24} = \text{Rm } 3\alpha + \ln 2\alpha = \ln 6\alpha^{2}$ $U^{2} = \ln x_{12} + \ln x_{24} = \ln 3(1-\alpha) + \ln 2(1-\alpha) = \ln 6(1-\alpha)^{2}$

The mitted utility of Person I is U'(w) = lu /+ lu/ = 0+0=0.

Person I will hat veto a Pareto Optimal allocation if its U'is > U'(\overline()) = 0: U 5 lu 62 0 6221

22716 \$> x> 1/6 or x< =1/6,

VIDLATES & between D

Contract Curve;

The install visitely of Person 2 is

U2(w2) = ln2+ln1 = ln2+0=ln2.

Person 2 will not verto a Pareto Optimal allocation if As U2 is 2, U2(co2) = lu2:

In 2 5 la 6 (1-2)2

2 5 6(1-2)2

1-13 20

violates a between O and 1

So we need & > 16 and d = 1-1/3.

This implies 21 between 3d = \frac{3}{16} = \frac{316}{6} = \frac{16}{2} and $3\alpha = 3(1-\frac{1}{\sqrt{3}}) = 3-\sqrt{3}$

 $\chi_{12} = 3 - \chi_{11}$

 $\chi_{21} = \chi_{01} = \frac{3}{3} \cdot 3d = \frac{3}{5} \chi_{11}$

 $\chi_{22} = 2 - \chi_{21} = 2 - \frac{2}{3} \chi_{11}$

Supe = 22/711 PHJON 2 519

Person 2

Corerep In[1]:= ParametricPlot[{Log[xoneone*(2/3)xoneone], Log[(3-xoneone)(2-(2/3)xoneone {xoneone, Sqrt[6]/2, 3-Sqrt[3]}] $x_{11} \in \left[\frac{\sqrt{6}}{2}, 3 - \sqrt{3} \right] \approx$ 0.73 0.72 [1.23, 1.27] 0.71 0.01 0.02 0.03 0.04 0.05 0.06 0.07 U=ln(x11. = x11) Out[1]= -Graphics-In[2]:= ParametricPlot[{Log[3 alpha^2], Log[(4-4alpha)(3-3alpha)]}, {alpha, 1/Sqrt[3], 1-(1/Sqrt[6])}] 0.74 0.73 0.72 又∈[清,1-た 0.71 0.03 0.04 0.01 0.02 $U' = ln(2\alpha \cdot \frac{3}{2}\alpha)$ Out[2]= -Graphics-In[31:= :. ParametricPlot[{Log[(5 alpha/(2-alpha))*(3 alpha/(2-alpha))],
Log[((5(1-alpha))/(2-alpha)) ((3(1-alpha))/(2-alpha))]}, {alpha, (-1+Sqrt[15])/7, (11-Sqrt[30])/13}] 0.725 0.72 0.715 0.71 0.705 0.04 0.06 0.02 0.695

Out[3]=

-Graphics-

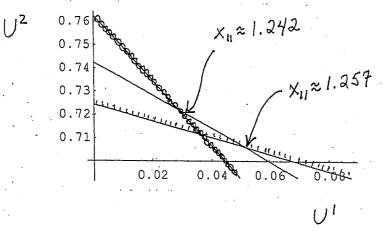


Fig.4

Macro 7007 Qualifier - 2010

PART I: (33%)

Answer one of the following two questions:

1. Suppose that the Central Bank minimizes the loss function:

$$L = \frac{\beta}{2} (y_1 - y_e)^2 + \frac{1 - \beta}{2} (\pi_2 - \pi^T)^2$$
 1 > \beta > 0

subject to the Philips Curve:

$$\pi_1 = \pi_0 + \alpha(y_0 - y_e) \qquad \alpha > 0.$$

The commodity market is described by the IS curve:

$$y_1 - y_e = -a(r_0 - r_S)$$
 $a > 0$.

y: log of real income

 y_e : long run equilibrium value of y

 π : inflation rate

 π^T : target inflation rate

r: real interest rate

 r_S : stabilizing real interest rate

Subscripts denote time.

- a. Derive the monetary rule followed by the Central Bank as a relationship between π_l and y_0 .
- b. Derive the Taylor rule for this economy. Interpret the lag structure behind this Taylor rule (that is when the Central Banks takes an action today, when does it affect output? inflation?).
- c. For the European Central Bank beta is very small. For the Fed it is higher. Why? Explain the implications of the value of β for the conduct of monetary policy in the US and the EU when these economies experience a contraction.
- d. Explain implications of parameters a and α for the conduct of monetary policy.
- 2. The IS and LM equations are respectively given as:

$$Y = Y(r) \qquad Y' < 0$$

$$m/p = L(r + \pi, Y)$$
 $L_{r+\pi} < 0, L_{Y>0}$

Y: real income

 π . expected inflation rate

r: real interest rate

m: log of money stock p: log of price level

- a. Suppose price level is constant and expected rate of inflation is zero. Derive the dr/dm and explain how an increase in money supply affects real interest rate.
- b. Suppose *dp/dm* responds partially to changes in money stock and is constant lying in the [0,1] interval. Derive the *dr/dm* and explain how an increase in money supply affects real interest rate. How does the size of the multiplier compare with what you obtained in part (a)? Why?
- c. Suppose $d\pi/dm > 0$ and 0 < dp/dm < 1 and both are exogenous. Find dr/dm. How does the size of the multiplier compare with what you obtained in part (b)? Why?
- d. Suppose there is complete and instantaneous price adjustment: $d\pi/dm=0$ and dp/dm=. Find dr/dm. How does the size of the multiplier compare with what you obtained in part (c)? Why?

Section II: (66%)

Answer two of the following four questions:

- 1. Compare and contrast critically microfoundations of the new-Classical and disequilibrium (quantity-constrained) macroeconomic models. Make sure that you explain what is meant by microfoundations.
- 2. Explain in detail the significance of real rigidities in the new-Keynesian theory. Make sure that you discuss rigorously where they come from and their theoretical significance.
- 3. Use the government budget constrain to derive the conditions under which the government would be insolvent (assume that the Central Bank keeps real money supply constant).
- 4. "Unemployment equilibrium persists if markets are not competitive."
 - a. Present a model where imperfect competition in the product market explains recessionary gap.
 - b. Present a model where imperfect competition in the labor market explains recessionary gap.

Graphical representation of models would suffice. In your responses make sure that you illustrate the gaps in each part by comparing unemployment and full-employment equilibria.

MACROECONOMICS QUALIFYING EXAM

7008 Section

Required Question

Explain the main differences between the Solow and Ramsey neoclassical growth models and the classical-Keynesian growth models. Describe in your reply:

- (a.) The Ramsey and Solow models
- (b.) The Kaleckian model (Rowthorn)
- (c.) The Kaldorian model (Thirlwall)
- (d.) The policy implications of both approaches

Optional Questions (must answer one)

Question 1.

Explain the significance of the Equifinality theorem and the capital controversies. What are the implications for growth theory?

Question 2.

What is the main difference between New Growth Theory (Romer/Lucas) and the old (Solow) neoclassical analysis? Explain.

Question 3.

Explain what types of shocks are relevant to explain variance in cross country growth performance and why. Also, discuss the relative relevance of policy measures and exogenous shocks in explaining growth differentials among countries.