Given Name:_____ Family Name:_____

Student number:_____ Signature:_____

UNIVERSITY OF TORONTO
Faculty of Arts and Science

ECO362H1F (Economic Growth)
Instructor: Kripa Freitas

MIDTERM
October 24, 2012
Duration: 110 minutes

Non-programmable calculator allowed

This examination paper consists of 9 pages and 4 questions. Please bring any discrepancy to the attention of an invigilator. The number in brackets at the start of each question is the number of points the question is worth. Answer all questions. The exam is worth 100 points.

This is a closed book, closed notes exam. Please put away all notes and cell phones before the exam. All diagrams need to be clearly labeled for full credit.

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Question 1: (15 points) With the help of a diagram, explain the interaction between health and income. Using this diagram, describe the "Health view" of income differences, i.e. all differences between countries are a result of the different health environments for a given income level. This may be due to the prevalence of tropical diseases for example. Make sure your diagrams are clearly labeled.

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Question 2: Suppose there are two countries A and B. Their production functions are given by $Y_t = AK_t^{\alpha} (hL_t)^{1-\alpha}$.

2a)(7 points) Explain using equations how you would calculate their relative productivity levels, assuming that they are in steady state?

2b)(7 points) Suppose that country A suffers an earthquake that destroys half its capital stock. How will this alter the equilibrium relative productivity levels?

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2c)(7 points)The capital stock in these two countries is measured using official investment data. Suppose country A has a high level of corruption and the actual investment is actually half of what the official figures state. How does this affect your calculations of relative productivity levels?

Question 3: Consider the Solow model with technology growth. The production function is given by $Y_t = K_t^{\alpha} (e_t L_t)^{1-\alpha}$. where e_t is productivity at time t which grows at a constant rate $\hat{e}$.The economy invests a constant proportion (γ) of total income. The depreciation rate (δ) productivity (A) and population growth rate (n) are also constant.

3a)(6 points) Derive the equation that governs the evolution of the capital per effective unit of labor $\left(\tilde{k} = \frac{K}{eL}\right)$. Show all your steps clearly for full credit.

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3b)(8 points) On a clearly labeled diagram show the evolution of $\tilde{k}$ for any starting point. Describe the prediction for $\tilde{k}$ and explain the intuition behind it.

3c)(5 points) What is the growth rate of per capita income?

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3d)(15 points) Consider two countries Malawi and the US. They have the same investment rates (γ), population growth rates (n) and depreciation (δ). The only difference is that the growth rate of productivity is higher in the US ($\hat{e}_{US} > \hat{e}_{Malawi}$). Suppose that right now they have the same per capita income. On the same diagram, show the paths that each country's per capita income takes. Explain the reasoning and intuition behind your predictions.

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3e) Question(20 points) Go back to the scenario of a single country. Suppose that the population growth has a permanent increases to a higher rate $(n_{old} < n_{new})$. Using diagrams explain the effects on a country's per capita income due to this change. Explain your reasoning and make sure your diagrams are clearly labeled..

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Question 4: (10 points) Why do we use Purchasing Power Parity exchange rates instead of market exchange rates when comparing incomes across countries? What are the problems with using market exchange rates?

End of exam

This page is for rough work and will not be graded