

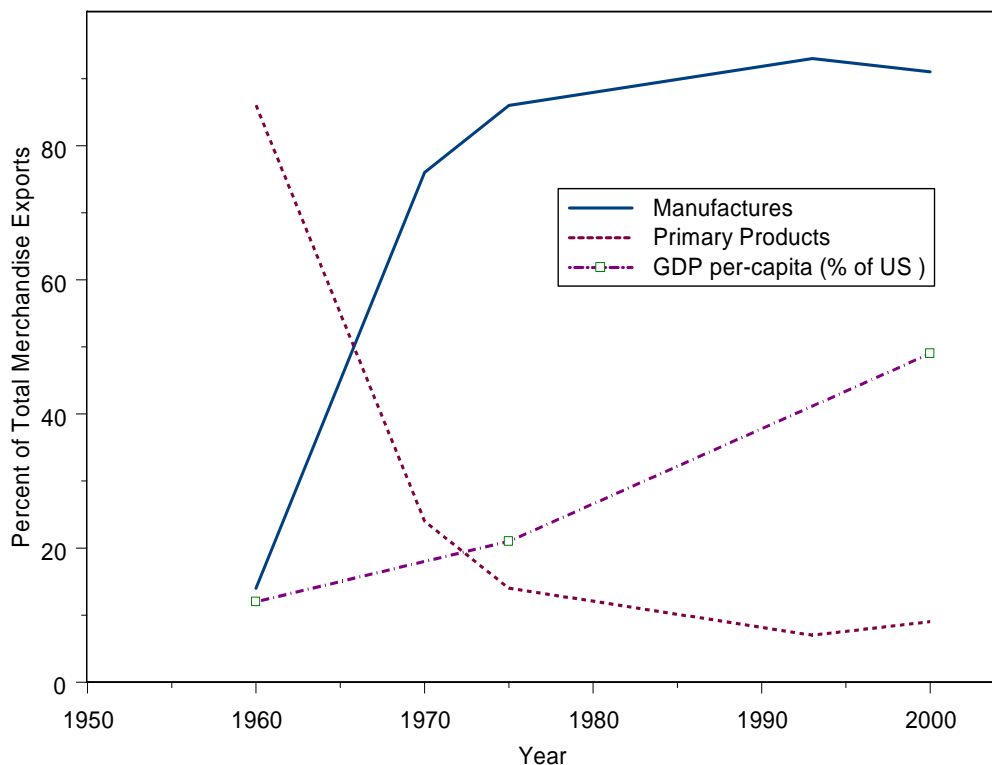
The Growth and Development of Nations in the Global Economy

Midterm Exam, Fall 2006

Short Answer Questions: Please answer 3 of 6 Questions (10 points each)

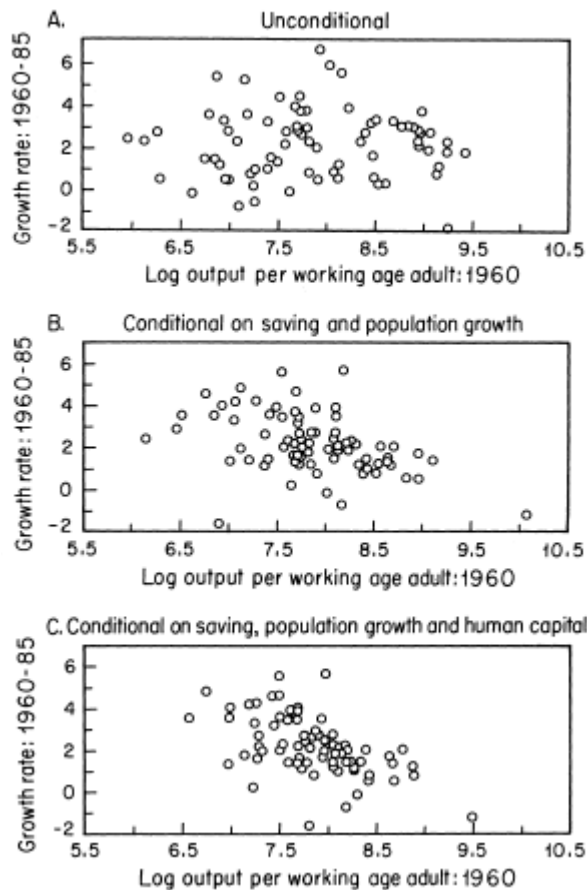
1. The graph below displays the evolution of Korean trade since the 1960s. From the perspective of the standard, factor endowment theory of trade (Heckscher-Ohlin), what explains the shift in the structure of Korean exports? That is, why has Korea's comparative advantage changed so dramatically from the perspective of this theory? From the perspective of this theory, what will happen to trade between the US and Korea assuming that Korea continues to converge with the US?

Structure of Exports, Republic of Korea



2. It is difficult to measure the causal effect of education on income since family background, work ethic, and ability affect both the level of schooling attained and income earned. Discuss one way that we discussed in class in which a researcher has measured the effect of education on income and how this technique avoided the above difficulty.

3. In 1992, Mankiw, Romer, and Weil wrote a famous paper on conditional convergence and the Solow model. (This is the same Weil who wrote our textbook.) They showed the following series of figures. Panel A has log output per worker on the x-axis and growth rates on the y-axis. Panel B takes out the pieces of output per worker and of growth rates which are due to population, savings, and depreciation. Panel C additionally takes out the pieces of output per worker and of growth rates which are due to education. Each dot represents a different country. From looking at these figures, do you think there is evidence of unconditional convergence? Do you think there is evidence of conditional convergence? Draw a similar figure which shows clear evidence of conditional convergence.



4. Tina Rosenberg (in “The Free Trade Fix”) argues that the global economic system will collapse if the less well off nations and people do not buy into globalization because they fail to benefit from it. Explain briefly whether or not you think that the risk that globalization will collapse is real. In answering this question, you must draw explicitly on evidence on the distribution of goods and services in the world today, using information from the Easterlin reading (“The Worldwide Standard of Living since 1800”), the Weil text and, or material presented in class.

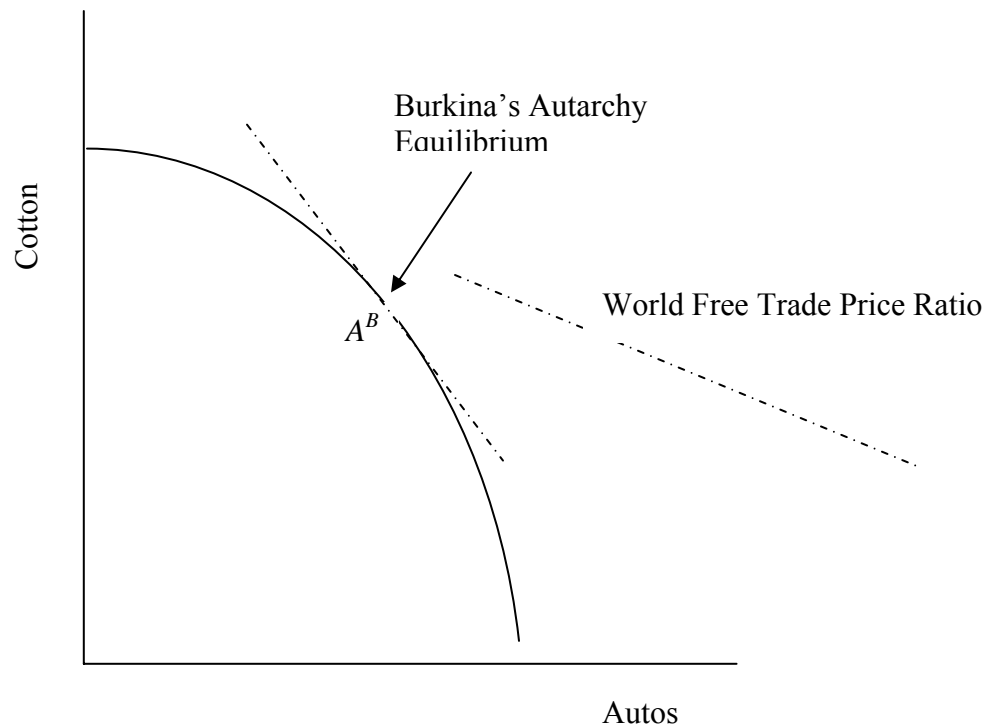
5. We saw in class that the steady state value of output per person (or income per person) in the Solow model is $y = A^{\frac{1}{1-\alpha}} \left(\frac{\gamma}{\delta + n} \right)^{\frac{\alpha}{1-\alpha}}$. We usually assumed that $\alpha=1/3$ and depreciation (δ) was 5% a year. The actual population growth rate in Spain is 1.6% a year, while in Paraguay it is 2.3% a year. Write down the formula for the ratio of Spain's per-capita GDP at the steady state over Paraguay's per-capita GDP at the steady state if the difference in population growth rates were the only difference between the two countries. Since you are not using calculators you won't be able to solve for an actual number, but you can get an idea of the magnitude. GDP per-capita in Spain is 21,000 while in Paraguay it is 4,700. Do differences in population growth rates explain most of the income difference between the two countries? The savings rate in Spain is 28% while in Paraguay it is 8%. Write down the formula for the ratio of Spain's per-capita GDP at the steady state over Paraguay's per-capita GDP at the steady state if the difference in savings rates were the only difference between the two countries. (You can now ignore the difference in population growth rates.) Do differences in savings rates explain most of the income difference between the two countries?
6. Consider the invention of antibiotics. This invention made people considerably healthier. Use a graph to show why this invention also made people considerably more productive economically. Draw and explain the multiplier effect (i.e. the fact that after the invention of antibiotics people got even healthier than the direct effect of the antibiotics).

Long Questions: Please answer 1 of 2 Questions (30 points)

1. This question is related to the Solow model augmented with population growth and human capital.
 - a. Malthus argued that only widespread deaths from famines and epidemics would prevent the world population from growing exponentially. Explain Malthus' argument using words.
 - b. Imagine that avian bird flu sweeps the globe and kills half of the population, without destroying any capital or technology. The people who are left try their best to carry on exactly as before. Draw a figure(s) and show what Malthus believed would happen in this case. Explain the short-run and long-run effects on levels of income per capita and growth-rates of income per capita. Make sure to label your figure(s) clearly.
 - c. Draw a figure(s) and show what Solow believed would happen in this case. Explain the short-run and long-run effects on levels of income per capita and growth-rates of income per capita. Make sure to label your figure(s) clearly.
 - d. Population Services International (PSI) is a nonprofit organization based in Washington DC which addresses health problems in low-income populations. Their original goal back in 1970 was to improve reproductive health: "PSI gives millions of low-income families around the world the means to space births, [and] avoid unintended or unhealthy pregnancies." They claim that "every year, there are 66 million unintended pregnancies and more than 500,000 women die from pregnancy-related causes." Do you believe this is a worthy cause? Give some specific evidence as well as some additional economic intuition.
 - e. In the late 80's PSI expanded their portfolio of projects to include HIV prevention, malaria prevention, and safe water. Imagine that they have hired you because they feel like they may be spreading themselves too thin. They would like to cut back on the projects in which they are involved, but are having trouble deciding which projects are the most useful in terms of promoting growth and development. What advice would you give them as to which projects they should cut back on and which projects they should focus on? Give specific advice as to the pros and cons of different possible focuses. (You do not have to repeat pieces of your answer from part d, but can refer back to your answer above.)

2. This question asks you to think about the complex real world of north-south commodity trade using a relatively simple model of 2 countries (the US and Burkina Faso), 2 commodities (autos and cotton), and 2 factors of production (labor and capital). Assume that autos are the relatively capital-intensive good, and that the US has a higher capital-labor ratio than Burkina.
- a. The diagram below represents the production possibilities curve for Burkina Faso. Burkina's autarchy equilibrium is denoted A^B and the relatively steep line tangent to the production possibilities frontier represents the autarchy price ratio in Burkina. The relatively flat line represents the world price ratio that would exist under complete free trade. First, explain why Burkina's autarchy price ratio is so flat compared to the free trade world price ratio. Second, using this diagram show how Burkina can make itself better off if it specializes and produces a little more cotton and trades the extra cotton away for autos at the world price ratio.

Autarchy Equilibria in North and South



- b. The Oxfam report we read (“Finding the Moral Fiber”) reports that the US multi-billion dollar subsidies reduce Burkina Faso’s purchasing power from its exports by \$14 million. How do US subsidies have this effect? Using the production possibilities diagram, illustrate and explain the reduction in Burkina’s purchasing power that results from US subsidies.

- c. While the Oxfam estimates take Burkina's production structure as given, explain why the elimination of US cotton subsidies would be expected to increase Burkina's production of cotton. If this change or structural adjustment were to take place, what would be predicted to happen to factor prices (the relative price of capital and labor) in Burkina Faso. Please explain your answer fully and indicate whether you think that this change would be a good thing or a bad thing.

- d. Finally, the paper we read by Anderson and Valenzuela ("The WTO's Doha Cotton Initiative") estimates that cotton subsidies cost the US itself \$429 million in lost GDP. First, please explain how cotton subsidies can cost the US economy so much money. Second, if the subsidies are so expensive to the US, why does the US have the subsidies? Finally, do you think the US should eliminate its subsidies, and if so how do you think they could be eliminated? If you do not think they should be eliminated, please explain why not.