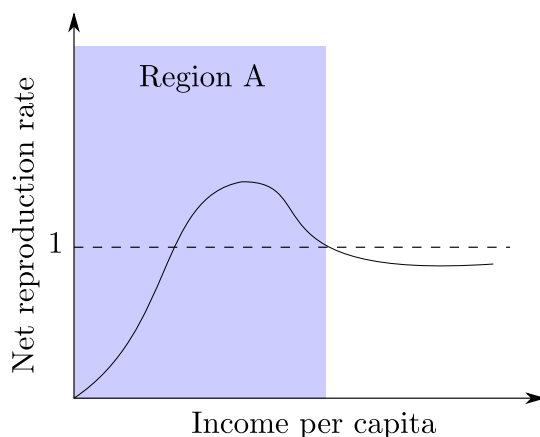

Midterm Exam

You have until 10:50am to complete the exam, be certain to use your time wisely. Answer all questions directly on the exam. You may use any printouts and notes that you brought with you. No electronic devices may be used during the exam. Answer questions completely but concisely. Including additional incorrect information in an otherwise correct answer may result in a loss of points. Remember to put your name on the exam. Good luck!

Name:

1. (20 points) Recall the traditional view of the agricultural revolution: technological change in the agricultural sector led to a massive increase in agricultural productivity that allowed Britain to feed its growing population during the Industrial Revolution. Explain how you could use the theory of comparative advantage to test whether this traditional view is accurate. In other words, how could you utilize the concept of comparative advantage to test whether the productivity increases in agriculture were similar in magnitude to productivity increases in manufacturing during the Industrial Revolution. Be certain to explain the data you would use, the comparisons you would make, and how any empirical findings would or would not confirm the traditional view of the agricultural revolution.

2. (30 points) Recall the graph below providing an alternative view of the demographic transition. The horizontal axis measures income per capita. The vertical axis measures the net reproduction rate.



- (a) Explain why an economy at income levels in region *A* on the graph would be stuck in a Malthusian trap, where equilibrium income per capita remains constant even with small improvements in technology.
- (b) Given the shape of the graph, explain why a large technology shock could move an economy out of the Malthusian trap into a regime where gains in income per capita from future technological shocks are persistent.
- (c) Consider the following quote from the Mokyr reading:

The Malthusian and epistemic constraints were broken not only because propositional knowledge got better at informing technology, but also because there was a feedback from improved technology into more knowledge that created the virtuous circles that broke the negative feedbacks of pre-industrial society.

Using this quote as the basis for your argument, explain why a single large technological shock may not have been necessary and may not have been sufficient to move a society out of the Malthusian trap.

3. (20 points) Suppose that we wanted to do our standard growth accounting in Great Britain at the time of the Industrial Revolution, decomposing growth in output per worker into the components due to growth in capital per worker, growth in land per worker and growth in technology.
- (a) Describe the ideal data you would need to do this growth accounting exercise, being as specific as possible.
 - (b) How would you expect the values of growth in output per worker, capital per worker, land per worker and technology to compare to seventeenth century values for Great Britain? Be certain to explain your answers.
 - (c) How would you expect the values of the share of payments to capital and the share of payments to land to compare to seventeenth century values for Great Britain? Be certain to explain your answers.

4. (30 points) Recall the changes to female's allocation of time between leisure, household production and the formal labor sector that occurred during the Industrial Revolution and De Vries' attempts to model those changes.
 - (a) In class we discussed the child quantity-quality tradeoff modeled by Gary Becker using similar arguments about household resource allocation. How would you expect the increased labor market opportunities of females during the Industrial Revolution to impact the number of children and the amount of time invested in children in the typical family? Your answer should relate, at least in part, to the De Vries reading.
 - (b) Suppose that the formal labor market opportunities for females during the Industrial Revolution also existed prior to the Industrial Revolution. In other words, assume that female workers had the same extensive number of jobs available to them at the same wages before the Industrial Revolution as during it. Using the model of the household developed by De Vries, explain why there would still have been an increase in female labor force participation during the Industrial Revolution even if they had faced the same labor market opportunities in terms of number of jobs and wages before the Industrial Revolution.