Econ 342 - Global Economic History
College of William and Mary
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Midterm Exam

You have one hour and twenty minutes to complete the exam, be certain to watch the clock and use your time wisely. Answer questions completely but concisely. Including additional incorrect information in an otherwise correct answer may result in a loss of points. As a rough rule of thumb, five points typically take two well-crafted sentences to answer correctly and completely. So a 10-point question typically requires four concise sentences to answer. You may refer to hard copies of your notes, the lectures slides, and the readings. Good luck!

Name:

ID Number:

1. (15 points) Our basic growth accounting equation was:

$$g_Y = g_A + ag_K + bg_L + cg_Z \tag{1}$$

where Y is total output, A is technology, K is capital, L is labor, Z is land/natural resources and a, b, and c are the shares of output paid to the owners of capital, labor and land, respectively.

   (a) In your own words, explain why Moses Abromivitz described g_A as, "a measure of our ignorance."

   (b) Consider economic growth over the Twentieth Century. During this century, workers were getting more educated. Consequently, the same level of L will be more productive at the end of the century than at the start because each unit of L actually corresponds to more human capital. This will lead to an overestimate of g_A as some of the estimated growth in g_A is coming from increased human capital (an input) rather than growth in actual technology. Explain one other way that we may be over- or underestimating growth in technology due to not directly measuring growth in an important input over the Twentieth Century.

   (c) To get a better estimate of g_A, we could include something like growth in the number of college-educated workers in our growth accounting equation to account for the growth in human capital. Explain what clearly measurable variable you could add to the growth accounting equation to control for the input you discussed in (b) in order to get a better estimate of g_A.

2. (25 points) We discussed the model of De Vries (1994) related to the Industrious Revolution. Recall that this model related to households dividing their labor between leisure, home production, and market work. Utility for the household came from both leisure and the consumption of final goods that were a combination of purchased goods combined with household labor. In this question, we will explore how this model might extend to the introduction of personal computers.

   (a) In your own words, explain how the Industrial Revolution changed the allocation of time between home production, market work and leisure. Be specific about what aspects of De Vries' model changed (i.e., what aspects of prices, utility functions, sets of goods, and so on changed) and how that then led individuals to reallocate labor.

   (b) Now consider applying the same model to a more modern context: American households in the late-Twentieth Century. How would you expect the introduction of personal computers to change the allocation of time between leisure, household production and market production? Be certain to consider the modern analogues of all of the model components you considered in part (a).

   (c) One important aspect of De Vries' work was the differential impacts of the Industrious Revolution on male and female time allocation. Would you expect the introduction of personal computers to have differential impacts for females relative to males? Explain why or why not.

3. (25 points) In class, we looked at data that suggests that the relationship between births and income is now fairly flat. When we worked through the Malthusian model for preindustrial economies, we assumed that birth rates increased with income.

   (a) Explain one reason that birth rates would increase with income in a preindustrial world but would no longer hold in our modern world. Be certain to explain both why it would lead to a positive relationship between birth rates and income in preindustrial economies and why it would lead to a flat relationship between birth rates and income in a modern, wealthy country.

   (b) Would a horizontal birth rate curve by itself get us out of the Malthusian trap or would we still return to subsistence income after a positive shock to technology? Be certain to fully explain your answer, using clearly labeled graphs if helpful.

   (c) We've also seen some evidence that birth rates might be negatively related to income when looking across countries in modern times. Would a downward sloping birth rate curve get us out of the Malthusian trap or would we still return to subsistence income after a positive shock to technology? Be certain to fully explain your answer, using clearly labeled graphs if helpful.

4. (20 points) Mokyr (2008) provides an extensive discussion of the nature of technological change leading up to and during the Industrial Revolution. These technological changes helped usher in our era of modern economic growth. In class, we discussed how transformational the technological changes of the Neolithic Revolution were and yet they did not kick off modern economic growth.

   (a) Mokyr makes a distinction between *macroinventions* and *microinventions*. What would you consider the biggest macroinvention of the Industrial Revolution and why? What would you consider the biggest macroinvention of the Neolithic Revolution and why?

   (b) Offer an example of a useful, but not paradigm shifting, microinvention for the Industrial Revolution and one for the Neolithic Revolution. Note that this is not asking you to recall a specific invention from the readings or lecture. Given the macroinventions you described in (a), you should be able to deduce what microinventions likely followed.

   (c) With specific reference to the arguments made by Mokyr (2008), why do you think the macroinventions of the Industrial Revolution led to sustained technological change while the macroinventions of the Neolithic Revolution did not.

5. (15 points) Clark (2008) and Steckel (2008) document changes in the standard of living based on a wide range of measures, each of which have their own strengths and weaknesses. You also explored measures of the standard of living in your homework assignments. In this question, we'll consider the potential and limitations of these measures.

   (a) Choose one measure of the standard of living used in Clark (2008), one from Steckel (2008) and one that you used in your homework assignments. Rank these measures from the best at capturing the economic wellbeing of the typical household to the worst. Explain your reasoning behind your ranking.

   (b) Focusing on the same three measures, rank them from best to worst in terms of capturing the overall development of the national economy. Explain your reasoning behind your ranking.