Final Exam

You have until 3:30pm 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) One main argument of North and Thomas (1970) is that a change in institutions was required to create the conditions for modern economic growth. In particular, the development of stronger private property rights may have been a necessary condition for creating incentives to innovate.

   (a) Explain why private property rights may be a necessary condition for creating steady innovation in the modern world.

   (b) Are strong private property rights a sufficient condition for creating steady innovation? Be certain to fully justify your answer. Your answer should draw both on the arguments made by North and Thomas and on cross-country empirical evidence discussed in class.

2. (30 points) In class we considered the following growth accounting equation to evaluate the distribution of the gains from industrialization:

$$g_A = a \cdot g_r + b \cdot g_w + c \cdot g_s \tag{1}$$

where g_A is the growth rate of technology, g_r is the growth rate of the rental rate of capital, g_w is the growth rate of wages, g_s is the growth rate of the price of land, and a, b and c are the shares of total payments to capital, labor and land, respectively. Suppose that we split workers into two categories, skilled and unskilled. This would give us a slightly modified version of the above growth accounting equation:

$$g_A = a \cdot g_r + b_s \cdot g_{w_s} + b_u \cdot g_{w_u} + c \cdot g_s \tag{2}$$

where g_{w_s} is the growth in skilled worker wages, g_{w_u} is the growth in unskilled worker wages, b_s is the share of total payments going to skilled workers, and b_u is the share of total payments going to unskilled workers.

(a) Consider the technological changes shifting Britain from artisanal production to factory production. During this transition, how would b_s and b_u change and how would g_{w_s} compare to g_{w_u}? Be certain to fully explain your answer.

(b) Now consider the technological changes that occurred with the electrification of factories in the first half of the twentieth century. During this transition, how would b_s and b_u change and how would g_{w_s} compare to g_{w_u}? Be certain to fully explain your answer.

3. (30 points) In class we discussed the 'panda's thumb' aspect of British coal mining technology.

   (a) Keeping in mind the 'panda's thumb' analogy, briefly explain why differences in the nature of coal deposits between Britain and China led to differences in the countries' economic development during the 19th century.

   (b) Explain why we might expect these differences in the economic development of England and China during the 19th century to disappear over the twentieth century.

   (c) Explain why we might expect these differences in the economic development of England and China during the 19th century to persist (or even widen) over the twentieth century.

4. (20 points) The graph below depicts an isoquant (the solid curve) and an isocost line (the downward-sloping dashed line) for a textile manufacturer in Britain in the early 1900s. Given these curves, the firm's optimal combination of capital and labor is (K^*, L^*).
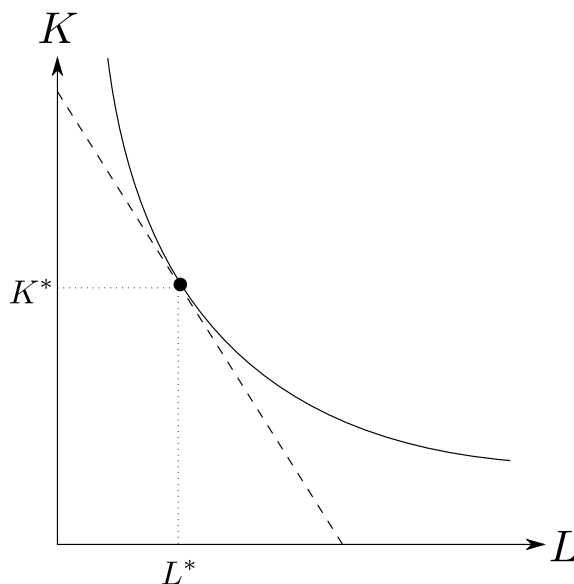
(a) The slope of the isocost line will depend on both the rental rate of capital and the wage for unskilled workers. How would these two parameters and the overall slope of the isocost line differ if the graph focused on a textile firm elsewhere in the British Empire in the early 1900s? Be certain to fully explain your answers.

(b) The slope of the isoquant will depend on the marginal product of capital and the marginal product of labor. How would these two values differ if the graph focused on a textile firm elsewhere in the British Empire in the early 1900s? Be certain to fully explain your answers.

(c) Given your answers to parts (a) and (b), how would you expect the optimal values of capital and labor to differ if the graph focused on a textile firm elsewhere in the British Empire in the early 1900s? Be certain to fully explain your answers.

Additional space for answers.

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