

## Econ 452

### Midterm Exam

Greg Dow

March 4, 2022

\*\*\*Please answer all questions. They have equal weight.\*\*\*

1. Define each of the following terms and say why it is important for economic prehistory: (a) Neanderthals; (b) Upper Paleolithic; (c) Ohalo II; (d) Natufians.
2. Choose one of the following readings: Kelly (1995), Harris and Ross (1987), Caldwell and Caldwell (2003), or Kremer (1993). For the reading you chose, answer the following questions: (a) what did the author(s) want to do? (b) what methods did the author(s) use? (c) what were the main conclusions? (d) what were the main strengths and weaknesses of the reading? Justify your answers.
3. Consider the model of foraging from Dow and Reed (2011). Give detailed answers to the following questions: (a) How do DR think population is determined in the long run? (b) How do DR think technology is determined in the very long run? (c) What do DR mean by a stagnation trap? (d) How can a foraging society escape from a stagnation trap?
4. Bellwood (2005) describes pristine agricultural transitions in southwest Asia, Africa, East Asia, and the Americas. If an economist wanted to understand the causes of agriculture, what are the most important things the economist should know about these four cases? If an economist wanted to understand the effects of agriculture, do these four cases suggest any general patterns? Explain.
5. Richerson, Boyd, and Bettinger (2001) claim that agriculture was impossible in the Pleistocene but mandatory in the Holocene. What do they mean by this? What is the logic behind their argument? What evidence do they offer to support their argument? What are the main strengths and weaknesses of their article? Explain.
6. Professor X says that some people in certain parts of the world switched from foraging to agriculture because biological evolution made these people smarter, and smart people are more likely to invent agriculture. What do you think Jared Diamond (1997) would say in response to this hypothesis? Give a full discussion based on everything you have read so far from "Guns, Germs, and Steel".

## Econ 452

### Midterm Exam

Greg Dow

March 2, 2020

\*\*\*Please answer all questions.\*\*\*

1. Suppose an economist wanted to study the Upper Paleolithic. For each of the following variables, discuss what information the economist could obtain and how: (a) population; (b) natural resources; (c) technology; (d) preferences; (e) institutions. Then rank these variables from the one with the most information to the least, and justify your ranking.
2. Assume people in foraging societies are risk averse. Describe several sources of risk in foraging societies, and then describe several ways in which people could try to manage such risks. What are the main strategies mobile foragers in the Upper Paleolithic would probably have used to manage risk? What are the main strategies sedentary foragers in the Holocene would probably have used? Explain your reasoning.
3. Use a series of graphs to describe the Malthusian model of population. Give a clear and complete explanation of why technological progress will lead to a larger population with an unchanged standard of living in the long run. Then briefly describe how Malthusian ideas are used in the models of Kremer (1993) and Dow and Reed (2011).
4. How does Jared Diamond (1997) explain where agriculture started? Is his explanation convincing? Why or why not? How do Richerson, Boyd, and Bettinger (2001) explain when agriculture started? Is their explanation convincing? Why or why not? Discuss whether the views of JD and RBB could be combined into a single theory, or whether they contradict each other.
5. Draw a graph with population ( $N$ ) on the horizontal axis and marginal products of labor on the vertical axis. Assume the MP for foraging has a finite vertical intercept and is a decreasing function of  $N$ . Assume the MP for agriculture has a finite vertical intercept, is a decreasing function of  $N$ , and is always below the MP for foraging (these curves do not intersect). Let the current population be  $N_0$ . Use this graph to discuss three general ways in which a society can shift from zero agriculture to doing some agriculture. In each case briefly describe how a change in an exogenous variable could lead to this outcome.
6. Many archaeologists believe that early farmers were worse off than their hunter-gatherer ancestors. Give a general description of the evidence for this view. Assuming that this is a fact, does it make any of the hypotheses about the origins of agriculture less likely to be true? Does it make any of the hypotheses more likely to be true? Explain.

## Econ 452

### Midterm Exam

Greg Dow

October 27, 2017

\*\*\*Please answer all questions.\*\*\*

1. Using the class lectures and any relevant readings, provide a general description of life in mobile foraging groups before the Holocene. What natural resources and technology did these groups tend to use? How large were they? What kind of locations did they prefer? How did they manage risk? Try to explain why these behaviors made economic sense.
2. Some authors claim that during the Upper Paleolithic, the world population growth rate was small but positive on average. Others claim that world population sometimes went up and sometimes went down, but the average growth rate was zero. Which view seems more likely to be correct? Could there be elements of truth in both? Using the lectures and readings, provide a detailed discussion of the issues involved.
3. What do we know about climate, technology, and population in Southwest Asia starting with the Last Glacial Maximum and ending with the Pre-Pottery Neolithic B? Hint: you might want to mention the readings by Weiss et al., Mithen, Bellwood, and Hillman et al. For this region and time period, does it make sense to think of climate as exogenous, and to think of technology and population as endogenous? Why or why not?
4. Consider the first nine chapters of Jared Diamond's book *Guns, Germs, and Steel*. What do you think are the two most important ideas from these chapters that were discussed in class? What do you think are the two most important ideas from these chapters that were not discussed in class? Briefly justify your answers.
5. Jacob Weisdorf (2005) reviews many possible explanations for the origins of agriculture. Describe two explanations from archaeology and two from economics. For each of these four explanations, say whether you find it convincing, and explain why or why not.
6. In their article "Stagnation and innovation before agriculture", Dow and Reed (2011) say that positive climate shocks caused technological innovation in foraging societies. But in their article "Climate reversals and the transition to agriculture", Dow, Reed and Olewiler (2009) say that a negative climate shock caused foragers to become farmers. Explain the economic reasoning in each case. Then discuss whether the arguments in the two articles are consistent or contradictory. Carefully justify your answer.

## Econ 452

### Midterm Exam

Greg Dow

October 28, 2016

\*\*\*Please answer all questions.\*\*\*

1. Define each of the following four concepts and explain why it is important for the study of economic prehistory: (a) archaic human; (b) radiocarbon dating; (c) blade technology; (d) broad spectrum revolution.
2. Some foraging societies share food while others do not. Kelly (1995) has a theory about why these differences exist. Carefully describe his theory. Then use some game theory to show why even when it is socially desirable for foragers to share food, there may not be any individual incentive to do so. Finally, explain how this problem might be solved.
3. Both Kremer (1993) and Dow and Reed (2011) describe their models as 'Malthusian'. In what sense is the Kremer model 'Malthusian'? In what sense is the Dow and Reed model 'Malthusian'? Use some math to explain your answers. Then discuss the predictions each model makes about population growth, and why these predictions are different.
4. Imagine you are writing this answer for an economics major at SFU who has not taken Econ 452. Summarize the most important things you have learned about the origins of agriculture from reading Peter Bellwood. Then do the same thing for Jared Diamond.
5. Richerson, Boyd, and Bettinger (2001) believe that agriculture was caused by the arrival of the Holocene. Dow, Reed, and Olewiler (2009) believe that agriculture was caused by the arrival of the Younger Dryas (at least in southwest Asia). Summarize the arguments RBB use to support their opinion, and do the same for DRO. How would RBB probably criticize the arguments of DRO? How would DRO probably criticize the arguments of RBB? Justify your answers.
6. Assume it is true that early farmers had a lower standard of living than their hunter-gatherer ancestors. Your friend is an economics student and says, "That doesn't make sense. Why would people voluntarily switch to a technology that makes them worse off?" What do you say to your friend? Make sure that your answer is consistent with standard ideas about rational economic behavior. Hint: there could be more than one factor involved. Try to describe a range of possible explanations.

## Econ 452

### Midterm Exam

Greg Dow

March 7, 2016

\*\*\*Please answer all questions.\*\*\*

1. Consider the period from 200,000 years ago to 5000 years ago. For this period, what do you think are the most important facts an economist should know about (a) climate; (b) technology; and (c) population? Justify your answers.
2. Harris and Ross (1987) think that prehistoric foraging societies had low fertility and low mortality. Caldwell and Caldwell (2003) think they had high fertility and high mortality. Describe the arguments for each point of view. Then discuss how food per person was probably related to the growth rate of population in these societies. Finally, discuss how Kremer (1993) would explain the level and growth rate of population in such societies.
3. According to Weiss et al. (2004), the people at Ohalo II ate both small-seeded and large-seeded grasses, although large-seeded grasses were easier to gather and more nutritious. Use a marginal product graph to explain why both resources were used. Then define a "broad spectrum revolution" (BSR). Finally, use the article "Stagnation and Innovation Before Agriculture" by Dow and Reed (2011) to explain how a BSR could occur.
4. Diamond (1997) presents an explanation for the origins of agriculture. Richerson, Boyd, and Bettinger (2001) present another explanation. Describe each explanation and discuss whether both of them can be true, or whether there is a conflict between them. Does the archaeological evidence from Bellwood (2005) tend to support Diamond, RBB, both, or neither? Justify your answer.
5. Use words and graphs to explain the Dow, Reed, and Olewiler (2009) theory about the origins of agriculture in southwest Asia. Be clear about the definitions of variables, the sequence of events, and the differences between short run and long run situations. Then give three examples of observations that could be made by future archaeologists for some other region of the world that would contradict the DRO theory. Justify your answers.
6. You are discussing prehistory with a friend who is an economics major but hasn't taken Econ 452. Your friend says: (a) "I don't understand how economic theory could be useful in explaining the behavior of prehistoric people"; (b) "anyway, it is impossible to get data about economic behavior in prehistoric societies". How would you respond?

## Econ 452

### Midterm Exam

Greg Dow

October 27, 2015

\*\*\*Please answer all questions.\*\*\*

1. Starting around 200,000 years ago, anatomically modern humans (*Homo sapiens*) began to spread across the world. Where did *Homo sapiens* first evolve? How do we know? In what order did *Homo sapiens* reach each new continent? If possible provide approximate dates for this process. Then describe who the Neanderthals were, and explain why some modern humans have small amounts of Neanderthal DNA while others do not.
2. According to Kelly, what is the main reason why food is shared among the members of small hunting and gathering bands? How does Kelly account for the fact that some HG societies do a lot of food sharing while others do less? Use game theory to explain why it is sometimes tempting for individuals or groups not to share food, and discuss how this problem can be solved in practice.
3. Harris and Ross discuss fertility and mortality in hunting and gathering societies from an anthropological point of view. Caldwell and Caldwell discuss the same two topics from a demographic point of view. Describe one major area of disagreement between these two readings, and discuss the arguments on each side. Then use a graph to explain the theory of Malthusian population dynamics, and discuss how these two readings are related to it.
4. Choose either the article by Kremer or the article by Dow and Reed. Do not write about both. For the article you choose, answer the following questions: (a) What facts does the article try to explain? (b) What are the main cause and effect relationships in the model? (c) Why do the author(s) think these relationships exist? (d) What economic conclusions do the author(s) reach and why? Use algebraic notation where appropriate.
5. Based on the information from Bellwood, Diamond, and the lectures, what features of the natural environment made Southwest Asia especially likely to have a pristine transition to agriculture? Do you think Natufian society had any particular characteristics that made it more likely to have such a transition? What were the main effects or consequences of the transition to agriculture in SW Asia? How were pristine transitions to agriculture in other parts of the world similar to or different from SW Asia? Explain using two examples.
6. Weisdorf surveys numerous theories about the transition from hunting and gathering to agriculture. (a) Briefly describe three archaeological theories about the reasons for this transition and discuss the main problems with each theory. (b) Use a graph of marginal product curves to describe three distinct economic theories about this transition. Again, discuss the main problems with each theory.

## Econ 452

### Midterm Exam

Greg Dow

October 26, 2012

\*\*\*Please answer all questions. You should mention names of authors when possible.\*\*\*

1. In chapter 3 of "Guns, Germs, and Steel", Diamond (1999) points out that the Spanish army came to South America and conquered the Incan empire; the Incas did not come to Europe and conquer Spain. How does he explain this fact? Discuss both the short run (or proximate) causes and the longer-run (or ultimate) causes.
2. Describe the economy of southwest Asia at three different points in time: (a) the last glacial maximum (about 21,000 BP); (b) the Natufian period (about 14,000 BP); and (c) the pre-pottery Neolithic B (about 10,000 BP). For each period, discuss the climate, the main food sources, the available technology, and the population density. What are the most important factors that explain why the economy of the region changed over time?
3. Kremer (1993) says "technology limits population". What does this mean? In Kremer's model, what limits technology? According to the article by Dow and Reed (2011), what limits population? What limits technology? Explain your answers.
4. Suppose in a hunting and gathering economy there are two food resources ( $r = 1, 2$ ). The marginal product of labor curve for resource 1 is above the MPL curve for resource 2 and both curves have finite vertical intercepts. There are  $N$  people who want to maximize the total output of food. Carefully explain how the allocation of labor depends on the size of  $N$ . How does this model relate to the idea of a broad-spectrum revolution (BSR)?
5. Student A says "the article by Baker (2008) was useful in understanding the reasons for the pristine transitions to agriculture described by Bellwood (2005)". Student B says "the article by Baker was useful in some ways but it did not shed any light on the transitions described by Bellwood". Develop the details of the argument made by each student and say which opinion is closer to your own. Carefully justify your answer.
6. Weisdorf (2005) surveys many theories about the origins of agriculture. Choose two of the theories mentioned in his article, one from archaeology and one from economics. In each case (a) describe the theory; (b) say what the theory implies or predicts about facts that are potentially observable by archaeologists; (c) say whether your knowledge of the facts makes the theory seem likely to be right or likely to be wrong; and (d) justify your answer. If there is not enough information to answer (c), then describe some empirical research that would help you to make a clear judgment and explain your reasoning.

## Econ 452

### Midterm Exam

Greg Dow

November 4, 2010

\*\*\*Please answer all questions. You should mention names of authors when possible.\*\*\*

1. Sketch the state of (i) global climate; (ii) food technology; and (iii) social organization at 13,000 BP (before present). Starting from this point, Jared Diamond believes that events over the next several thousand years had a crucial influence on the modern world. What events does he think were important? How does he think they shaped the modern world?
2. Harris and Ross believe that hunter-gatherer societies typically had low fertility and low mortality. Caldwell and Caldwell think that HG societies typically had high fertility and high mortality. Describe the reasoning behind each of these arguments, and evaluate the merits of each argument. What does a Malthusian model predict (if anything) about the standard of living in hunter-gatherer societies? Explain.
3. Compare the model in Kremer's (1993) paper "Population Growth and Technological Change" with the model in Dow and Reed's (2010) paper "Stagnation and Innovation Before Agriculture". In what ways are the two models similar? In what ways are they different? Although these models deal with overlapping issues, the authors may have constructed their models differently because they had different goals. Discuss briefly.
4. Consider the so-called "Broad Spectrum Revolution" (BSR). What does this term mean? Can you give examples of situations where a BSR may have occurred? What theoretical explanations of this process have been offered by archaeologists? Do those explanations make sense from an economic standpoint? Explain.
5. Consider Baker's (2008) paper "A structural model of the transition to agriculture". Give a short description of his theoretical model, and then give a short description of his main empirical findings. Do you think Baker's work is useful for understanding the transitions to agriculture in SW Asia, sub-Saharan Africa, East Asia, or the Americas? Explain.
6. Richerson, Boyd, and Bettinger (2001) believe that (a) agriculture was impossible during the Pleistocene but (b) became mandatory during the Holocene. Explain their arguments for points (a) and (b). Do their arguments fit into the 'marginal product' framework used by Weisdorf (2005) in his survey of economic theories about the transition to agriculture? Why or why not?



## Econ 452

### Midterm Exam

Greg Dow

October 29, 2009

\*\*\*Please answer all questions. You should mention names of authors when possible.\*\*\*

1. We discussed chapters 8 and 9 of Jared Diamond's book Guns, Germs and Steel in class. These chapters dealt with differences in the biological endowments of plants and animals for different regions of the world. Summarize some other important idea from earlier in the book (before chapter 8). Why is the idea important? Evaluate the merits of the idea and explain any criticisms you may have.
2. Economists interested in prehistory generally want information about natural resources, technology, population, preferences, and institutions. For a foraging society that existed several thousand years ago, explain what kind of evidence is typically available for each of these variables. Describe the problems that generally arise when an economist tries to obtain evidence on each variable, and say how these problems might be handled.
3. Archaeologists often treat 'population pressure' as an exogenous variable. However, economists interested in prehistory often treat population as an endogenous variable. From an economic point of view, what are the exogenous variables that determine the equilibrium level of population in a hunter-gatherer society? What is the theoretical justification for this framework? What is the empirical evidence that supports it?
4. Consider the paper by Dow and Reed (2008) called "Stagnation and Innovation Before Agriculture". What is this paper about? What are the main theoretical points Dow and Reed are trying to make? Is their theory consistent with what you know about hunter-gatherer societies in the Upper Paleolithic? Why or why not?
5. What is the difference between cultivation and domestication? What are some factors that tend to shorten the time lag from cultivation to domestication? List three important regions of the world that had pristine transitions to agriculture. For each region, describe a few major plants and/or animals that were domesticated there, and give an approximate date for the earliest evidence of domestication (not cultivation).
6. Suppose Cohen (1989) is correct that (a) early farmers had worse nutrition than their hunter-gatherer predecessors, and (b) early farmers also had more disease. Discuss the possible causes of facts (a) and (b). Then say whether these observations make some theories about the origins of agriculture more likely to be true, and whether they make some theories less likely to be true. Explain your reasoning.

## Econ 452

### Midterm Exam

Greg Dow

October 21, 2008

\*\*\*Please answer all questions. You should mention names of authors when possible.\*\*\*

1. Describe life in a typical hunter-gatherer society from Europe or Northern Asia during 40-20 KYA. Comment on the climate, food resources, technology, group size, the kinds of locations people used, and any other important features of this way of life. Does it seem that people were making rational economic decisions, given the environment they faced? Why or why not?
2. According to Kelly, what are the main exogenous variables that determine whether or not a foraging group will (a) share food among its members; and (b) allow other groups to use its territory? What are the costs and benefits of these practices? Be sure to indicate conditions under which people would probably not share food, and conditions under which groups would probably not share land with other groups.
3. Most models of foraging societies assume that (a) the average product of labor is downward sloping and (b) population rises when food per capita is high, but falls when food per capita is low. Explain why each of these assumptions is reasonable. Combining these assumptions, how is the equilibrium population size determined? Use a graph to explain your answer. If the technology of food production improves, what happens to population and food per person in the short run? In the long run?
4. Choose one formal model from the reading list in which technology is treated as an endogenous variable. According to the model, is there an equilibrium productivity level? If so, how is this productivity level determined? If not, what determines the rate of productivity growth? Does the model make sense? Why or why not?
5. Southwest Asia had especially favorable biological conditions that encouraged the transition to agriculture. What were these conditions? Why were they important? Provide as much detail as possible. Did this region also have technological or social advantages that helped make it 'ready' for agriculture? Explain.
6. Weisdorf presents a graph in which (a) the marginal product of labor in foraging is initially constant but eventually falls; and (b) the MPL in agriculture is horizontal. Draw this graph and explain why the curves look the way they do. Then use the graph to explain the three ways in which a foraging society could begin to do some agriculture. Finally, use logic and evidence to discuss whether each case is a likely explanation for the actual pristine transitions described by Bellwood and others.