Economics 1: Introduction to Economics

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Meta-Announcement

- We are moving announcements and administrivia out of lecture time and onto the “announcements” bCourses page...
- That is all...
For the Rest of the Course...

• 2016-03-28 Mo - 2016-04-06 We: Measurement, Growth, and the Circular Flow (FBAH chs. 15-21)
• 2016-04-11 Mo - 2016-04-20 We: The Keynesian Approach (FBHA chs. 22-25)
• 2016-04-25 We - 2016-05-09 Mo: Yet More Issues, Final Review, and Exam (FBHA ch. 26)
For the Rest of the Course...

• Measurement, Growth, and the Circular Flow:
  • 2016-03-28 Mo Lecture: Measuring the Macroeconomy (Read Frank et al. chs 15-17)
  • 2016-03-30 We Lecture: Economic Growth in the Very Long Run (Read Frank et al. ch 18)
  • 2016-04-04 Mo Lecture: Saving, Investment, Finance, Money, Prices, and Banking (Read Frank et al. chs. 19-20)
  • 2016-04-06 We Lecture: Business Cycles (Read Frank et al. ch 21)
    • 2016-04-06 Wu/-07 Th Assignment: Problem Set 5 (growth and the circular flow)
For the Rest of the Course...

• The Keynesian Approach:
  • 2016-04-11 Mo Lecture: Income and Spending (Read Frank et al. ch 22) (2016-04-11 Mo)
  • 2016-04-13 We Lecture: The Federal Reserve and Monetary Policy (Read Frank et al. ch 23) (2016-04-13 We)
    • 2016-04-13 We/-14 Th Assignment: Problem Set 6 (the Keynesian model) due
  • 2016-04-18 Mo Lecture: Aggregate Demand and Aggregate Supply (Read Frank et al. ch 24)
  • 2016-04-20 We Lecture: Macroeconomic Policy (Read Frank et al. ch 25)
    • 2016-04-20 We/-21 Th Assignment: Problem Set 7 (macroeconomic policy)
For the Rest of the Course...

• Yet More Issues:
  • 2016-04-25 We Lecture: The International Economy (Read Frank et al. ch 26)

• The Wrap-Up
  • 2016-04-27 FINAL REVIEW
    • 2016-04-27 We/-28 Th Assignment: Problem Set 8 (international and other issues)
  • 2016-05-04 We/-05 Th Section Review Meetings
    • 2016-05-04 We/-05 Th Assignment: Problem Set 9 (final review) due

• 2016-05-09 Mo: FINAL EXAM
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- 2016-05-09 Mo: FINAL EXAM
Economic Growth: The Ten-Millennia Bird’s-Eye View

March 30, 2016 8-9 AM
Wheeler Auditorium, U.C. Berkeley
A Global Ten-Millennia Bird’s-Eye View of It All...

- Linguistic quasi-speciation 100,000 years ago—or Less?
- Radiation from the Horn of Africa 50,000 years ago?
- Neolithic Revolution 10000 years ago.
- Literacy Revolution 5000 years ago?
- Malthusian Agrarianism—near-stagnation—as the default state of post-Neolithic humanity?
- Industrial Revolution
- Modern Economic Growth
- Astronomy and the Fermi Paradox: The Great Filter

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Linguistic Quasi-Speciation 100,000 Years Ago—or Less?

- Anatomically-modern humans have been around for about 200,000 years
- *Behaviorally* modern humans have been around for at most half that time
- And maybe only a quarter...
- “Behavioral modernity”—such things as:
  - burial, fishing, cave paintings, petroglyphs, figurines, pigment and jewelry, long-distance transport, regionally-distinct artifacts, hearths
Radiation from the Horn of Africa 50,000 Years Ago?

- “Some 70,000 years ago, a part of the bearers of mitochondrial haplogroup L3 migrated from East Africa into the Near East.... From a population of 2,000 to 5,000 in Africa... possibly as few as 150 to 1,000 people, crossed the Red Sea...”
- India as their first apparent stop...
- Then radiation to Eurasia, Australasia—and then the Americas, Oceania...
Neolithic Revolution 10000 Years Ago

• Agriculture, herding a great thing for the generations that discover and introduce it...
• And agricultural regions fill up until population growth... stops...
  • Preventative check
  • Positive check
• Malthusian Agrarianism—near-stagnation—as the default state of post-Neolithic humanity?
• Possibly the worst mistake in the history of the human race?
Literacy Revolution 5000 Years Ago

• Agriculture, herding a great thing for the generations that discover and introduce it...
• And agricultural regions fill up until population growth... stops...
  • Preventative check
  • Positive check
• Malthusian Agrarianism—near-stagnation—as the default state of post-Neolithic humanity?
• Thereafter the pace of technological improvement is slow...
• But it is at least positive—and there is hope for something better now that knowledge can be reliably recorded
Malthusian Stagnation as the Default State?

- Look at from 8000 BC to 1500 or 1800
- Enormous increases in population
- But spread out over enormous lengths of time
- Static living standards for the most part
- Exceptions:
  - Colonization
  - Biotechnology
  - European marriage pattern
  - Asian lineage family pattern
  - Large-scale female infanticide
Why Malthusian Stagnation in the Agrarian Age?

- Exceptional elites
- Exceptional regions
- Exceptional eras
- European marriage patterns
- Asian lineage families
- Large-scale female infanticide
- Otherwise... Malthus rules
- And people— inventive people—aren’t that focused on rapid technological development

In the Shadow of Malthus

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“Stagnation”: To Your iClickers

• If a quantity grows at 0.1%/year, how long does it take before it has doubled?
  
  A. A thousand years
  B. A hundred years
  C. Ten thousand years
  D. Five hundred years
  E. None of the above

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- 694 years
- Compound interest, you know...

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Compound Growth

- Starting at 1 and growing at 0.1%/year...
  - After 1000 years the return on that original 1 = another 1...
  - But that addition has been accumulating, on average 0.5...
  - And it grows too: so return on the increment = another 0.5...
    - And so on:
  - \(1 + 1 + 0.5 + 0.167 + 0.042 + 0.008 = 2.71828182846 = e\)
  - If you grow at 0.1%/year for 1000 years you have not twice but 2.71828 times as much

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To Your iClickers...

• I tell you: $2^{10} = 1024$

• If it takes 694 years for a quantity growing at 0.1%/year to double, how long does it take to grow a thousandfold, roughly?
   A. 6912 years
   B. 10000 years
   C. 1694 years
   D. 1024 years
   E. None of the Above
To Your iClickers...

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Application to the Malthusian Era, 8000 BC-1500

- Growth of 0.1%/year = doubling time of 690 years
- Growth of 0.1%/year = thousandfold time of 6900 years
- We have 1.5 of those 0.1%/yr-thousandfold times since the Neolithic Revolution
- Changes that are absolutely glacial over a year or a generation do add up

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Industrial Revolution

• Then at the end of the eighteenth century comes the Industrial Revolution
• First in the British Midlands...
• Then spreading: Belgium, New England, Northern France, Ruhr, Silesia...
• Just another series of inventions, but lucky enough that coal-steam-rails-cotton had a high elasticity of demand?
• Or a game-changer?
Then We Escape. How Likely Was Escape?

- Malthusian Agrarian as the default state of post-Neolithic humanity?
- “Two heads are better than one” theories
- “Eye of the needle” theories
- Astronomy and the Fermi Paradox: The Great Filter

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Modern Economic Growth

• Then in the late nineteenth century: the Second Industrial Revolution
• The transition to Modern Economic Growth
• Population explosion followed by demographic transition
• 2%/year productivity growth in the industrial core...
• Catch-up or not catch-up elsewhere...
• The origins of large scale international economic inequality
• The role of migration and trade
Sources of Growth

- Technological advance
  - New goods and new types of goods
  - Making old goods more cheaply and efficiently
  - Ideas as the ultimate non-rival (and barely excludible) commodities
  - How to manage intellectual property?
- Investment
  - In physical capital
  - In human capital
- Governance
- Resources
  - Resource discoveries
  - Resource exhaustion
- Externalities
What Would the World Look Like Today without Commercial Revolution/Industrial Revolution/Modern Economic Growth?

• 1500-present like 0-1500...
• Growing technological competence
  • Zeng He
  • Infante Dom Enrique and Bartolomeu Dias
• But Malthusian dynamics
• 720 million people
• GDP per capita of $750/yr
• Technologies...
  • 0-1500 TP about 0.03%/yr
  • Technologies of 1590 or so—“Elizabethan”; late Ming; early Mughal

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Why Escape? Why Modern Economic Growth?

• Five important prerequisites:
  • Resources
  • Science
  • Technology
  • A market economy
  • Profits to be made from productive innovation

• Nurturing its continuation—and noting its fragility—perhaps the most important goal, and the most important lesson

• And here we get into astronomy and the Fermi paradox

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Astronomy and the Fermi Paradox: The Great Filter

- What happens next?
- Finally, since 1970 some signs of global catch-up
- Robert Gordon’s predictions of greatly slowed growth
- Where are our flying cars?
- Extrapolating growth
- The Fermi Paradox
To Your i>Clickers...

• Compare your living standard if you were a slave of Thomas Jefferson’s in 1800 versus a slave of Marcus Tullius Cicero’s in 50 BC. You were:

  A. Much better off as a slave of Cicero
  B. Much better off as a slave of Jefferson
  C. **About equally well off, but very poor and worked hard by your overseers** <<<
  D. About equally well off, but living a largely leisured life
  E. None of the above
• Our best guess of the total improvement in American agricultural labor productivity since 1800 is:
  A. That it is the same now as then
  B. That a farmer today is 250 times as productive
  C. That a farmer today is about 50 times as productive
  D. That a farmer today is about 10 times as productive
  E. None of the above
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Finance

April 4, 2016 8-9 AM
Wheeler Auditorium, U.C. Berkeley
What If Your Income Outruns Your Desired Expenditure Today?

• “Storage”
  • Store goods—but will they last?
  • Store durable goods—but are they salable?
  • Store durable, salable goods—but can you protect them, and will they hold their value?
  • Spend money turning your garage into an apartment and rent it out on AirB&B
  • Educate yourself so you can get a higher-paying job.
• Give it to the financial markets
Equity and Debt

• Equity
  • You get a share in the business
  • You gotta keep very close track of the accounting yourself
  • You gotta play a role in choosing managers—somehow

• Debt
  • They pay you back—with fixed interest
  • Only if they don’t pay you back—with interest—do you need to take action
    • And then you have powerful legal tools
Types of Bonds

• Discount bonds
  • You buy it for $B
  • It pays you $1 when it matures in T years
  • Interest rate: \((1/B)^{(1/T)} - 1\)

• Consol bond
  • You buy it for $B
  • It pays you a coupon of $c each year
  • Permanent interest rate \(c/B\)