Economics 1: Introduction to Economics

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Administrivia

April 4, 2016 8-9 AM
Wheeler Auditorium, U.C. Berkeley

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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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

In the Shadow of Malthus

| Year	Population (Millions)	GDP per Capita ($2015)	Total World GDP ($2015 Billions)
-8000	5	$750	$4
-1000	50	$750	$38
0	170	$750	$128
1500	500	$750	$375
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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
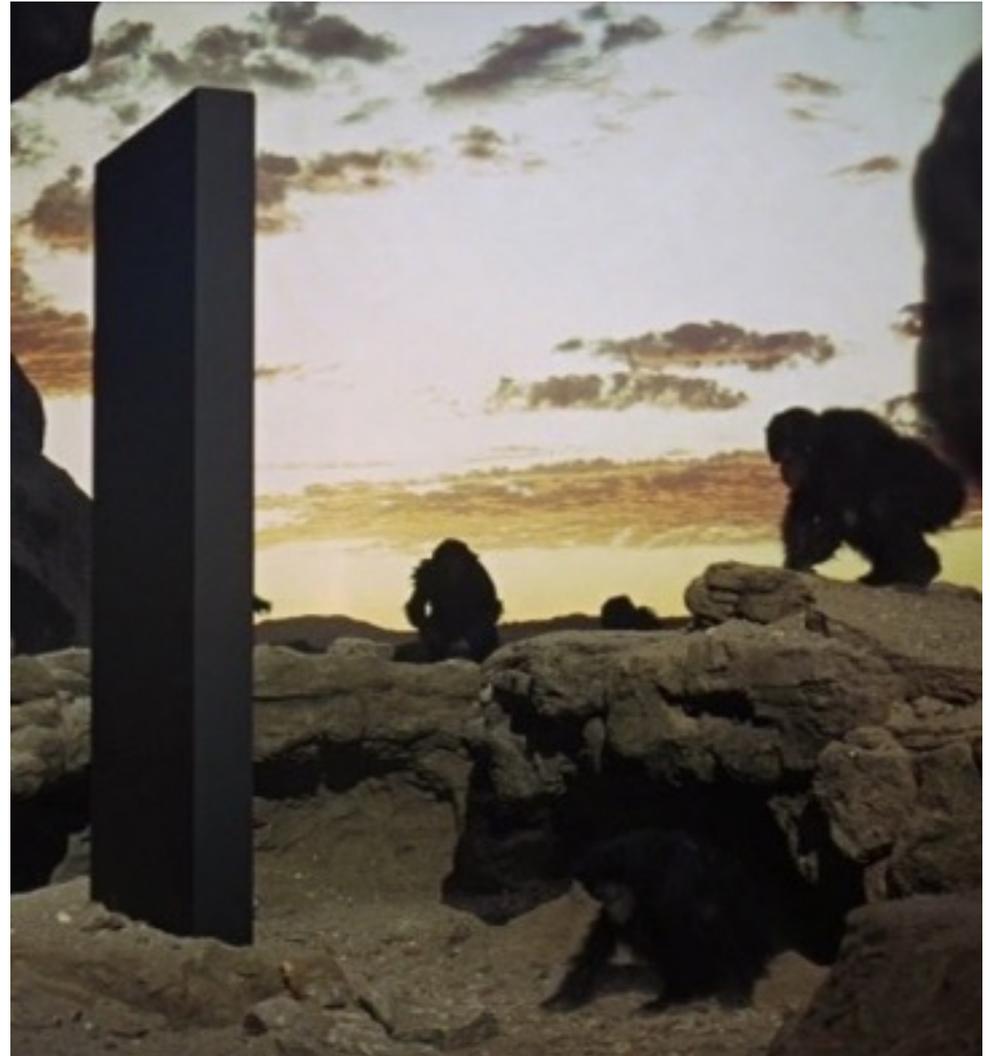
Radiation from the Horn of Africa 50,000 Years Ago?

- "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…
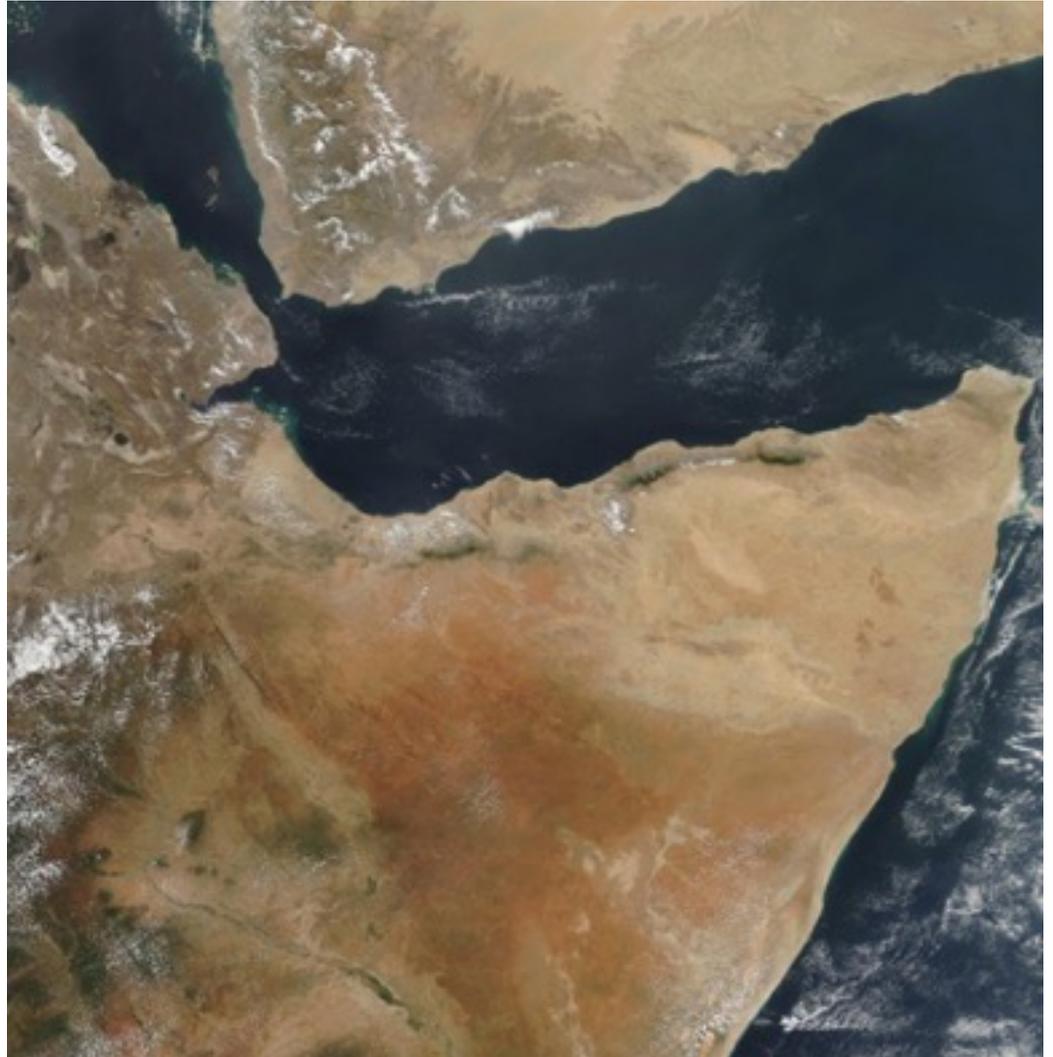
Neolithic Revolution 10000 Years Ago

- 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
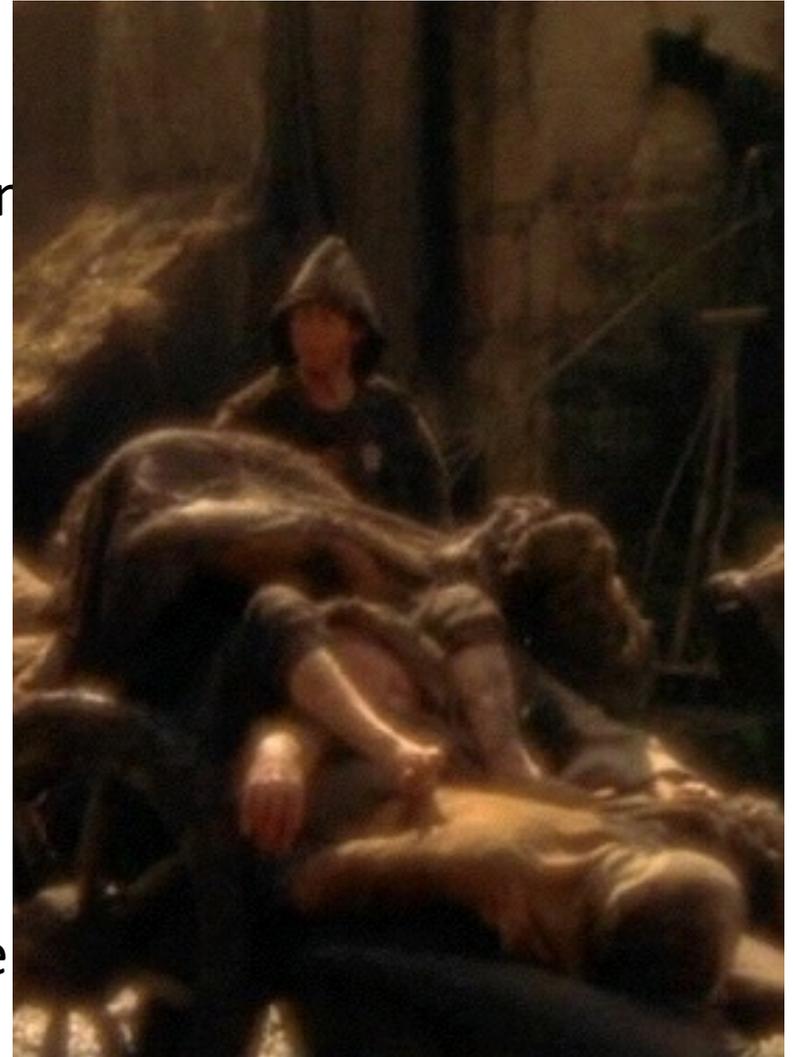
Why Malthusian Stagnation in the Agrarian Age?

- 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

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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

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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
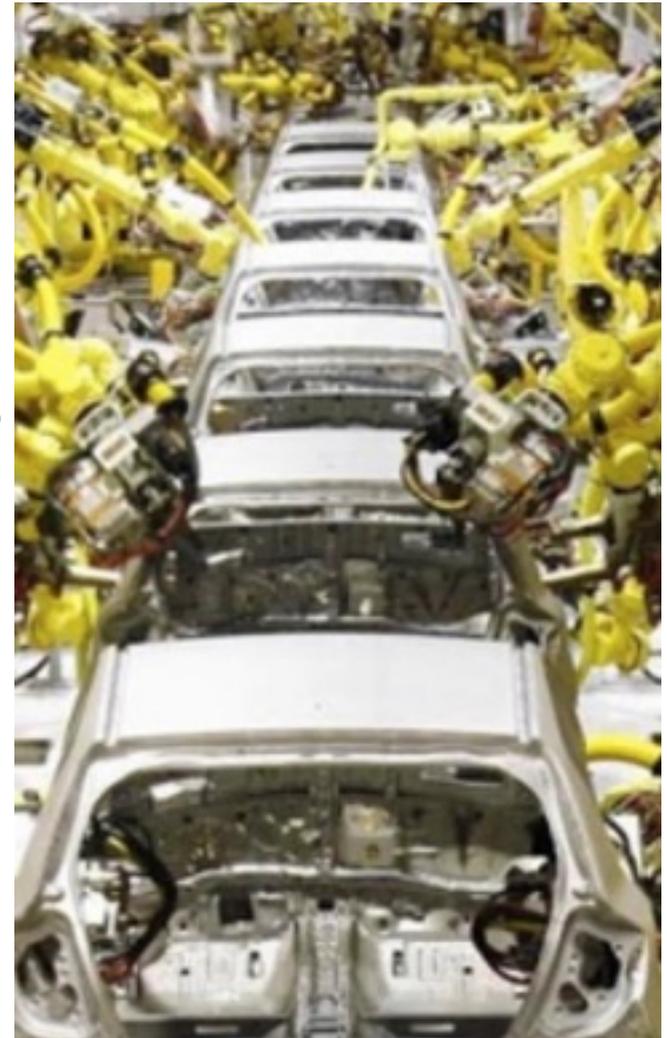
What Would the World Look Like Today without Commercial Revolution/Industrial Revolution/Modern Economic Growth?

- 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

To Your i>Clickers...

- 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
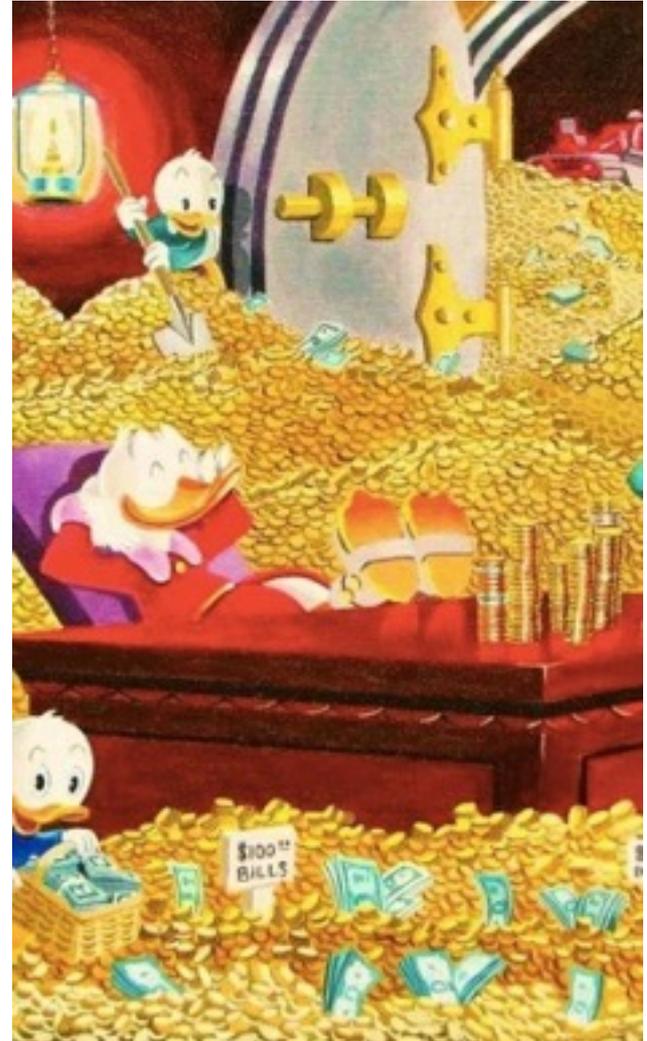
Equity and Debt

- 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