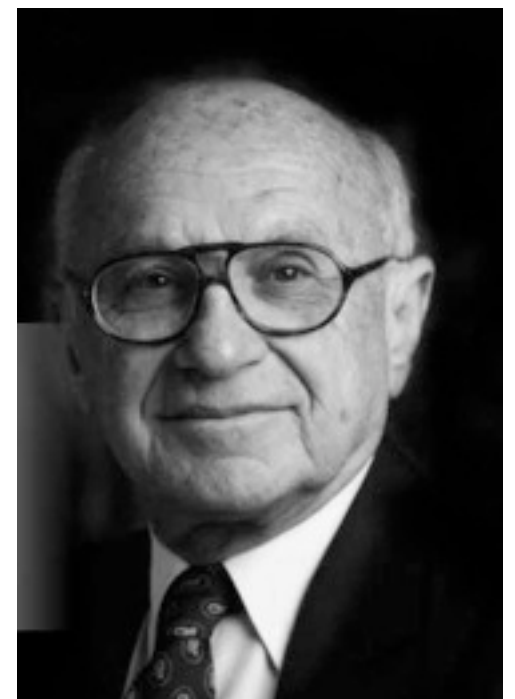
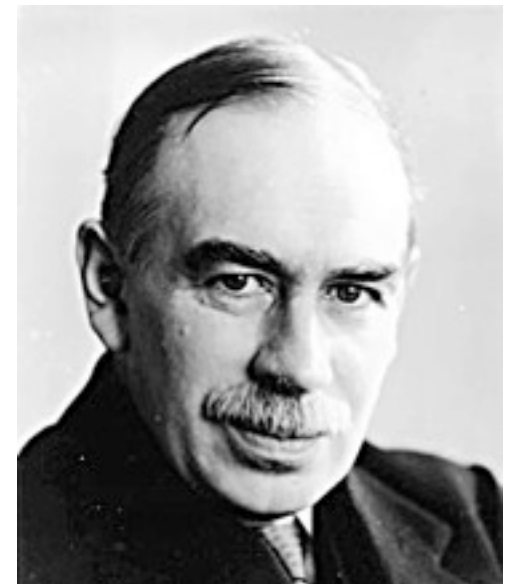
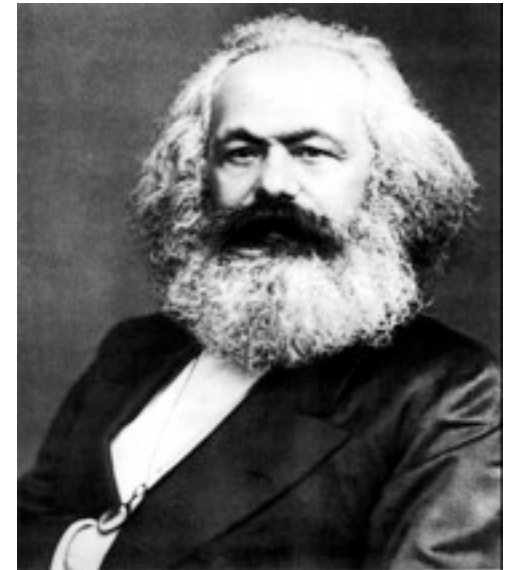
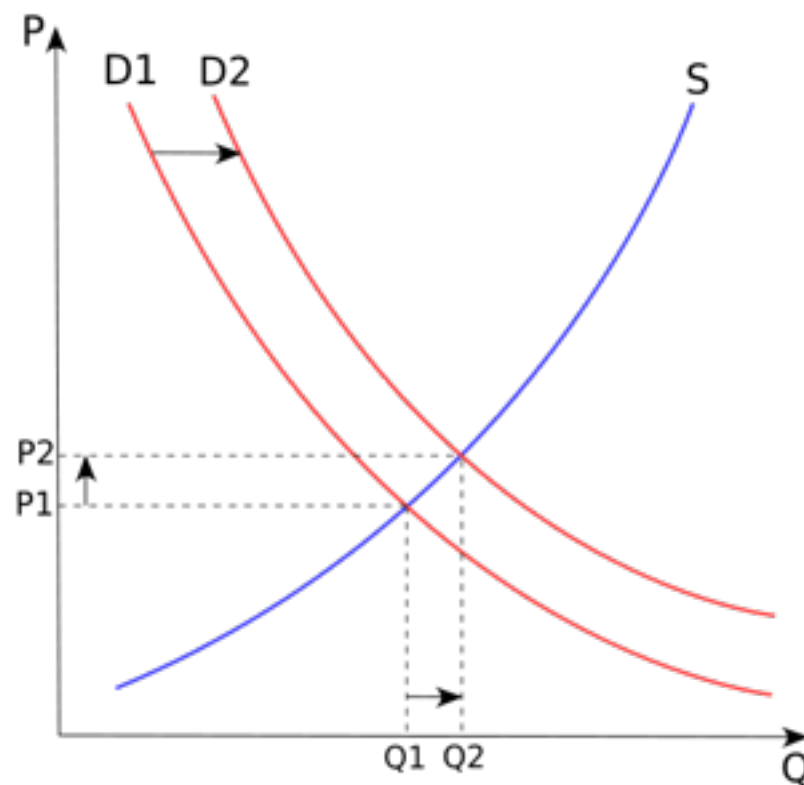


Economics

10 February 2011



<http://thebsreport.files.wordpress.com/2009/08/mill1.jpg>
<http://www.lib.unc.edu/coursepages/hist/images/AdamSmith.jpg>
<http://etablislements.ac-amiens.fr/0600001a/SPIP-v1-8-1/IMG/arton171.gif>
<http://www.donalforeman.com/blog/wp-content/uploads/2009/10/Marx.jpg>
<http://www.liberalhistory.org.uk/uploads/keynes.jpg>
<http://www.fcpp.org/images/cartoon/friedman.jpg>

Issues?

- What are the most important issues/questions at the intersection of economics, energy, and environment?
- Take 3 minutes to brainstorm a list

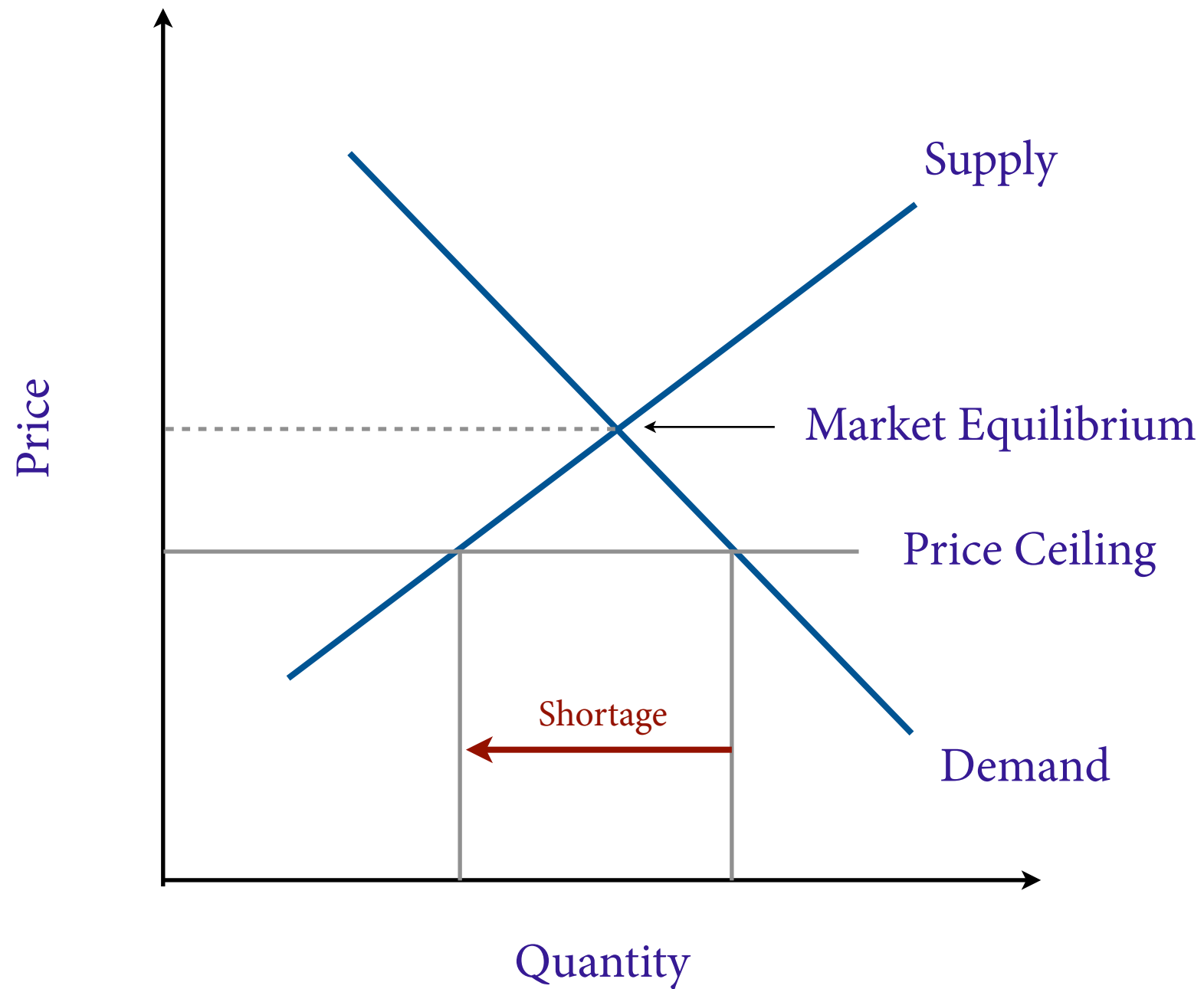
My Questions

- How does traditional economics consider resources, externalities, and the environment?
- What is growth? development?
- What is sustainable growth? sustainable development?
- What obligation does the North have not to use up the resources of the South?
- How does a cap-and-trade system for carbon compare to carbon taxes, emissions caps, “artificially” inflated energy prices, or any other viable scheme?
- What is the Oil Depletion Protocol?
- What is the “proper” role of species chauvinism?
- What is value?

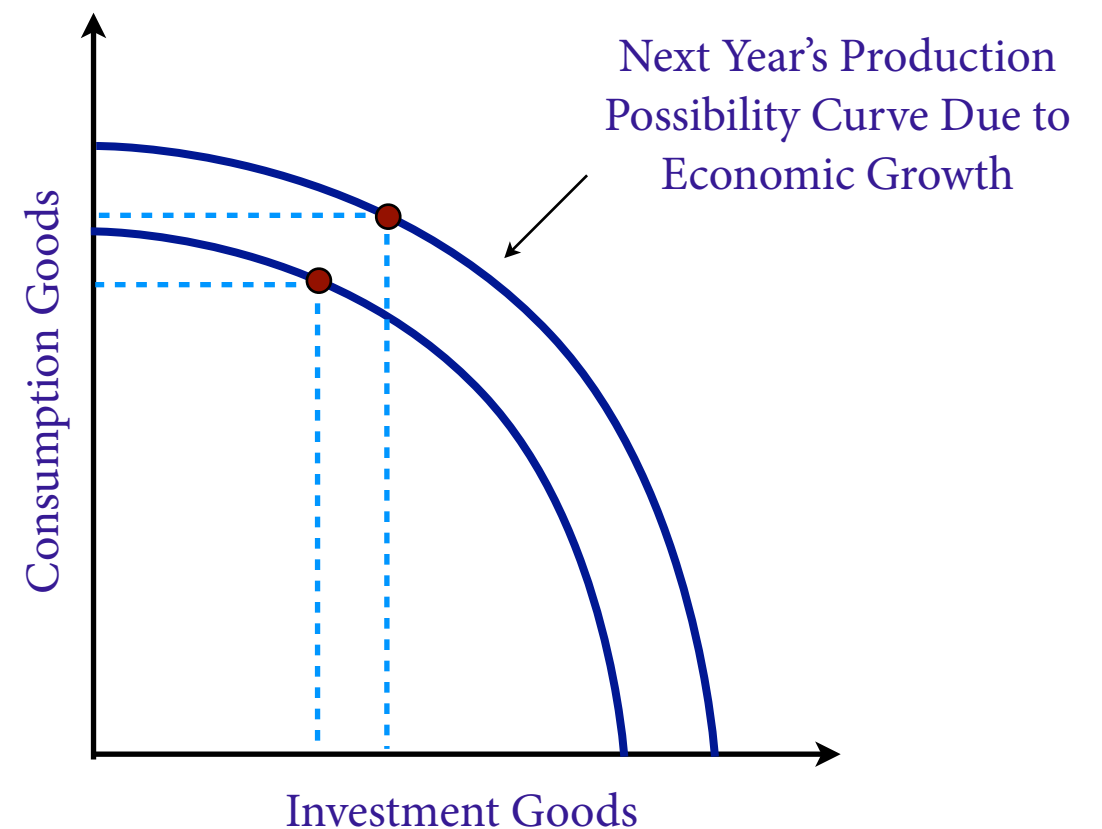
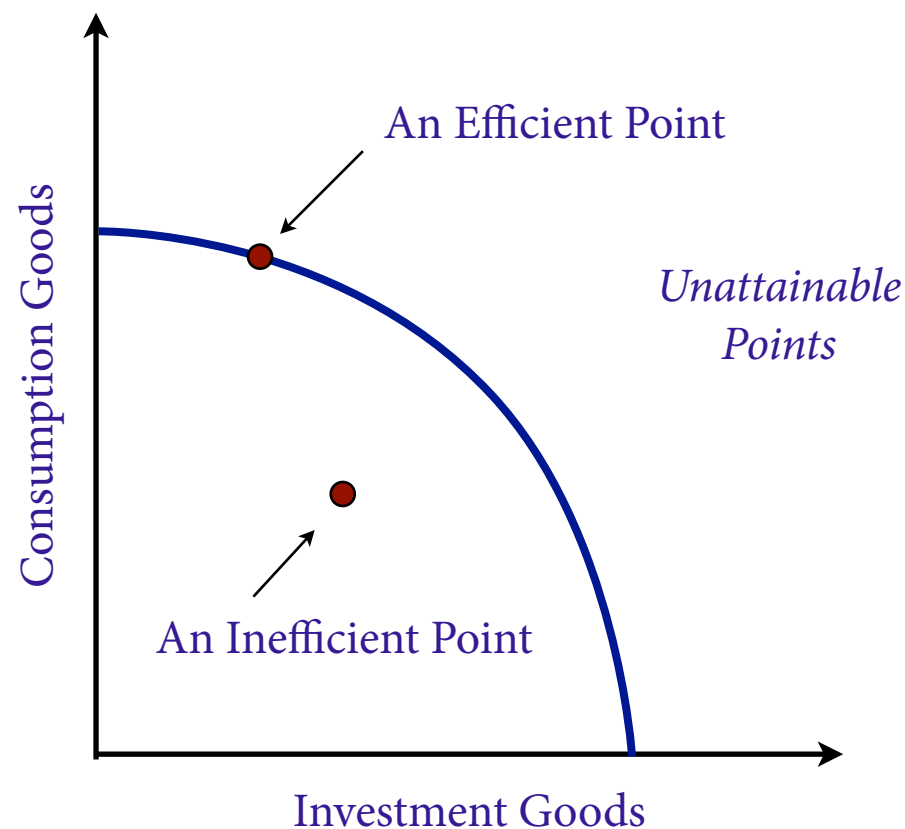
Definitions

- Economics is the study of how people choose to allocate their scarce resources.
 - scarcity
 - cost
 - marginal analysis
 - value
- “Even the rich want more!”

Supply & Demand



Efficiency & Growth



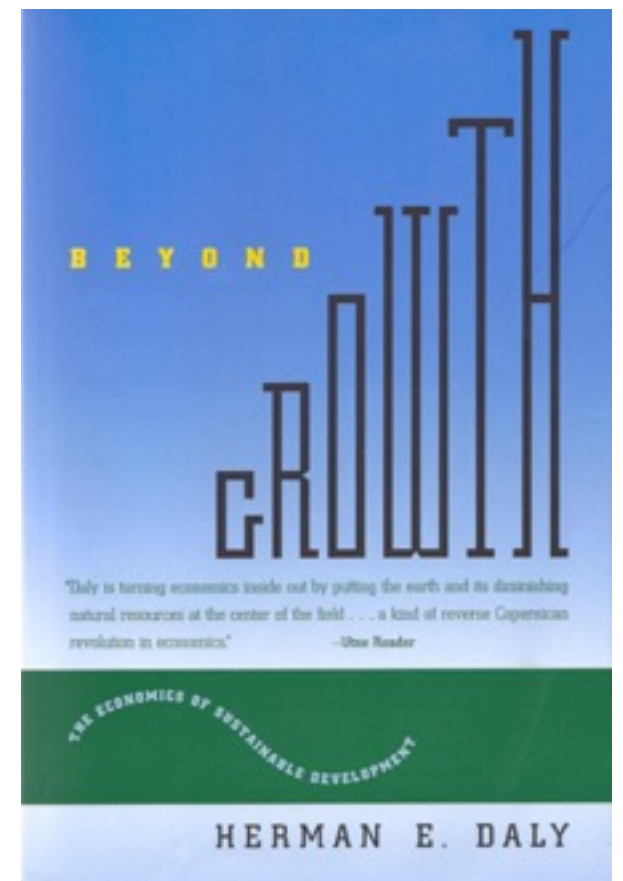
Causes of growth:

- Investment
- Innovation
- Increased division of labor
- Increased inputs

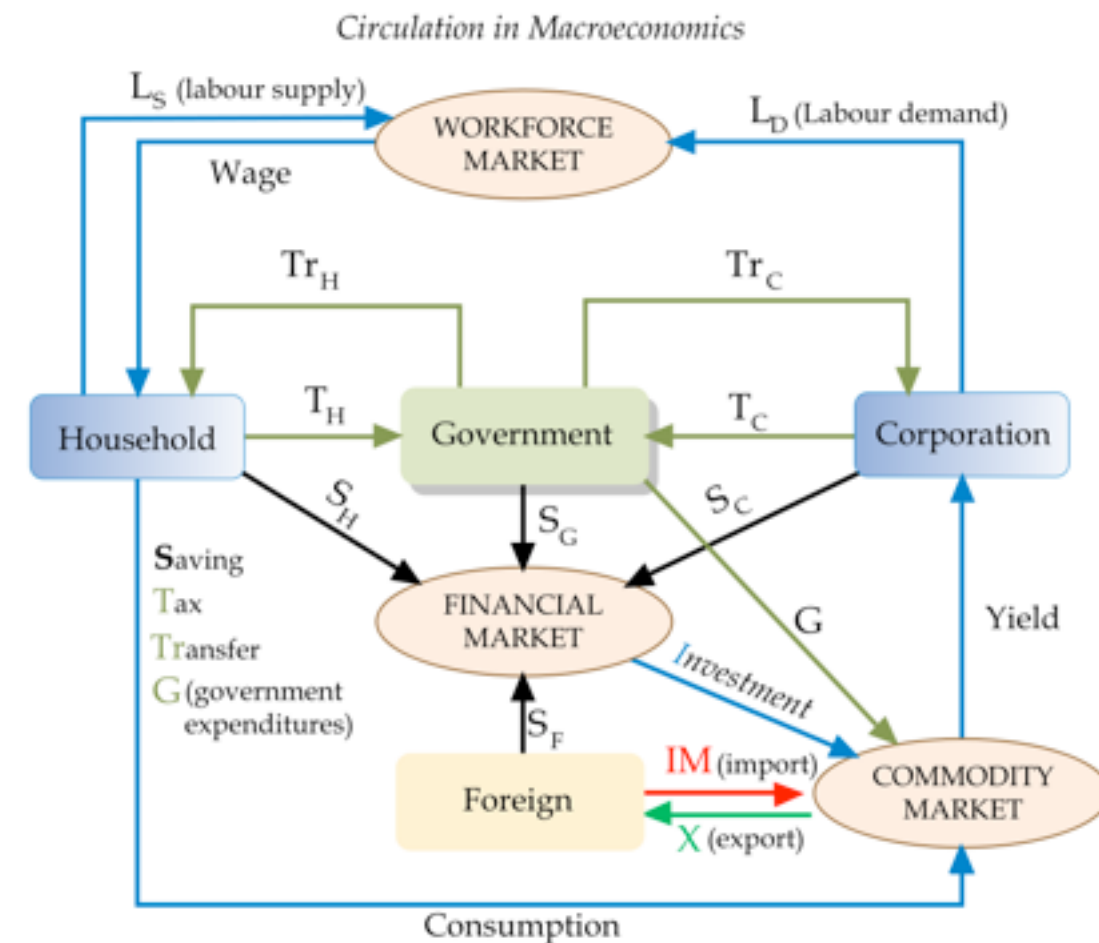
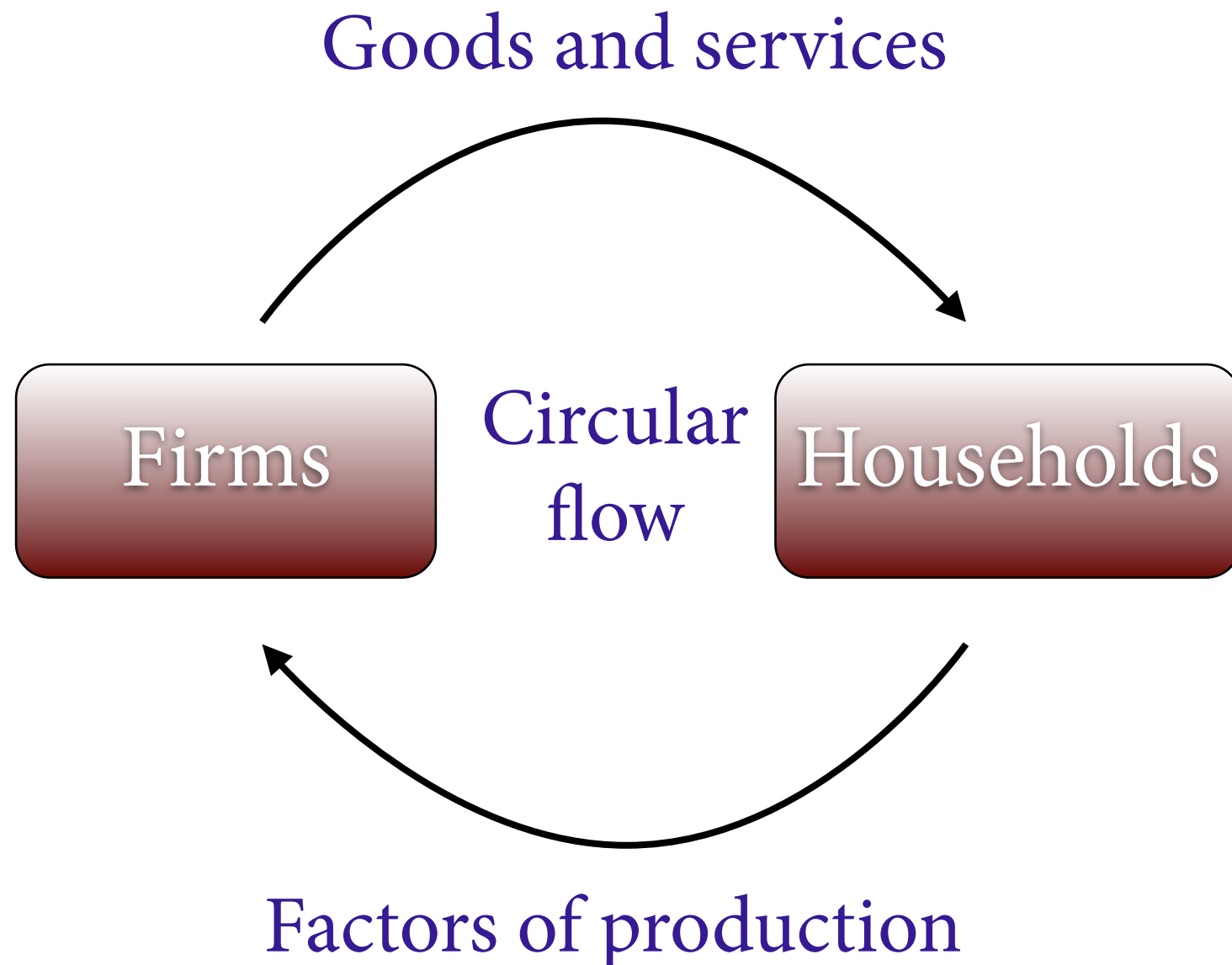
Herman Daly

- World Bank
- University of Maryland's School of Public Affairs
- Right Livelihood Award
- “Dean of ecological economics”

- **Neoclassical economics treats the environment as unlimited → growth is good**
- **The economy is a subset of the terrestrial ecosystem → there is a maximum scale for the economy consistent with preservation of the ecosystem**

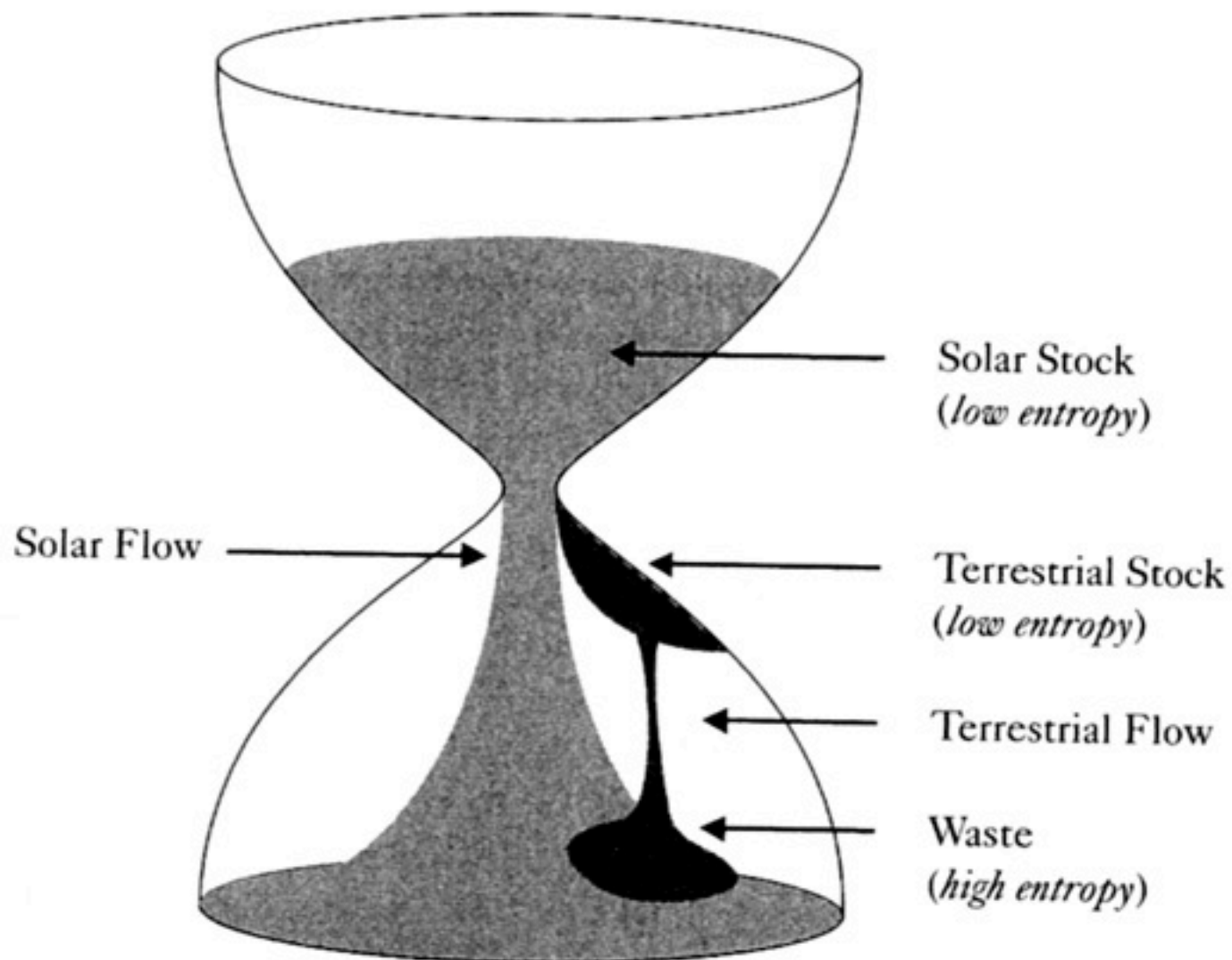


Neoclassical Economics



Economics and Thermodynamics

Figure 1. Entropy hourglass (Georgescu-Roegen)



- First law: the system is closed
- Second law: low-entropy materials and energy supplies are transformed into high-entropy matter/energy
- Terrestrial source of low-entropy material is our dowry; we can choose the rate at which we “consume” it.

The Role of Nature

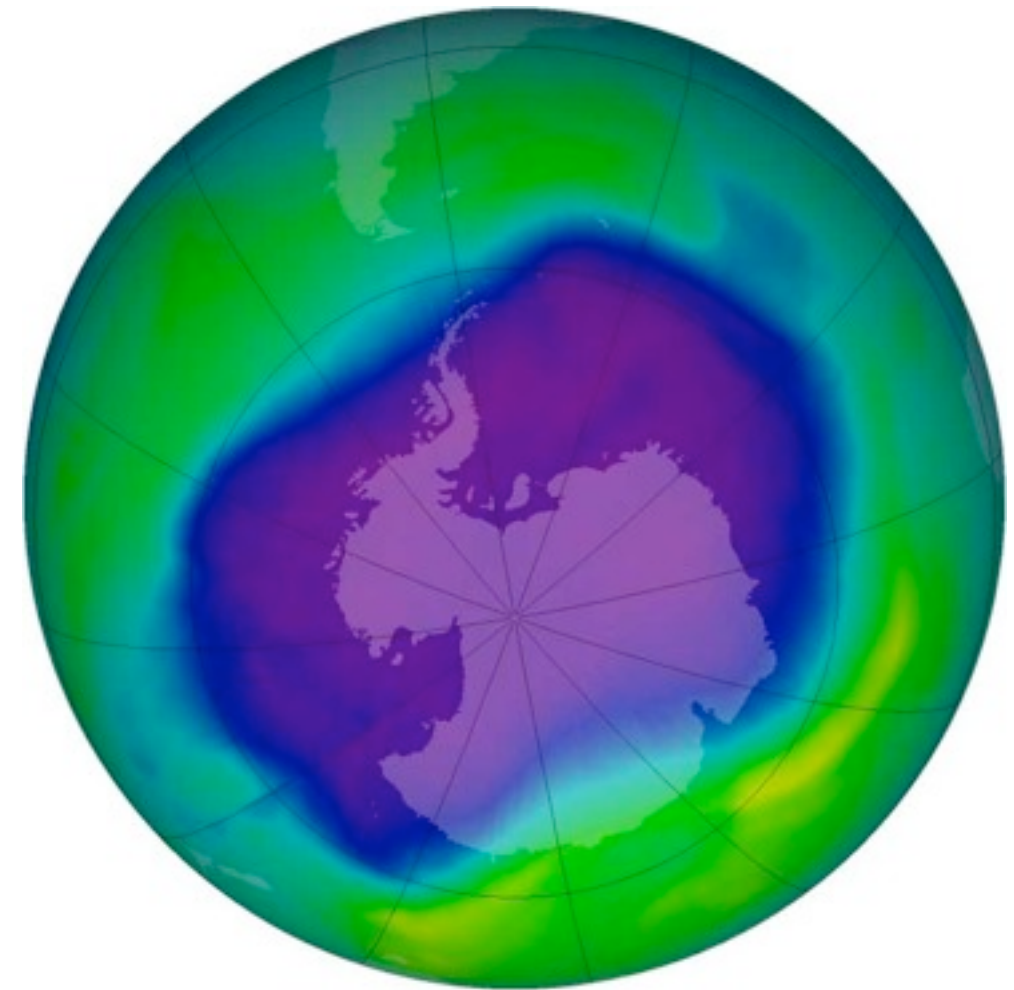
- The current practice of ad hoc introduction of “externalities” to take account of the effects of the growing scale of throughput that do not fit the circular flow model is akin to the use of “epicycles” to explain the departures of astronomical observations from the theoretical circular motion of heavenly bodies.
- “...without the enormous amount of work done by nature in concentrating flows of energy and stocks of resources, human ingenuity would be onanistic. What does it matter that human ingenuity may be limitless, when matter and energy are governed by other rules than is information?” (Earl Cook)

Externalities

- A negative externality is a cost of a transaction that is not borne by the parties to the transaction.
- Examples:
 - Increased cancers downwind of coal-fired power plants
 - Dead lakes caused by acid rain
 - Hole in the ozone layer
- How can externalities be handled in a capitalist framework?

Montreal Protocol

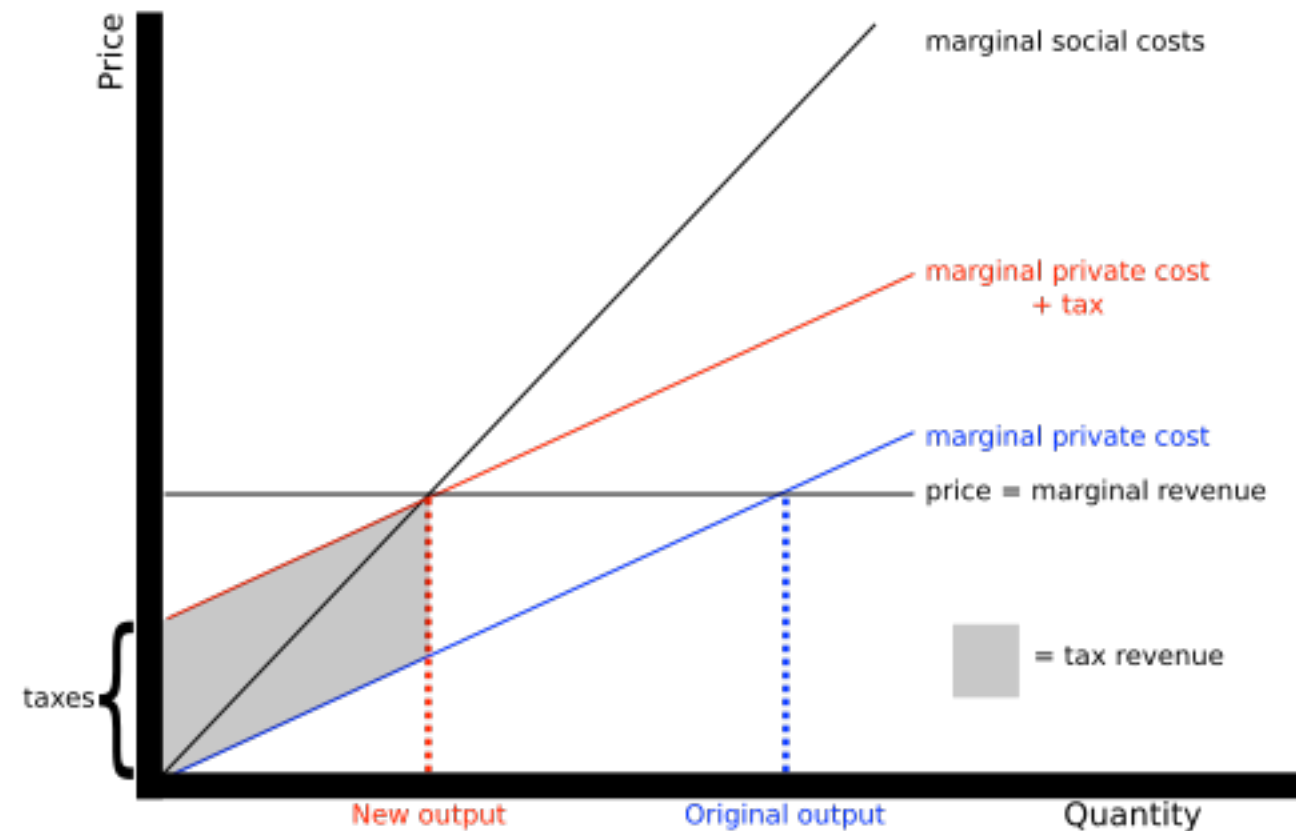
- Chemists Rowland and Molina of UCI argue CFCs catalyze ozone destruction (1973)
- Dupont Corp.: ozone-depletion theory is “a science fiction tale...a load of rubbish...utter nonsense.”
- Protocol begins: 1 January 1989
- “Perhaps the single most successful international agreement to date” — Kofi Annan
- Phased out of chlorofluorocarbons; phasing out of hydrochlorofluorocarbons



Largest ozone hole:
September, 2006

Pigo(u)vian Taxes

- Knowledge problem: what is the right level of tax?
Nobody can know for sure.
- Don't need to know perfectly.
- Some tax is better than no tax.
- May increase fairness or may be regressive



Pigouvian Tax

Cap-and-Trade

- A central authority (government) sets a cap on a pollutant
- Companies are issued permits to pollute, which they may trade
- Provides an incentive to clean up so you can sell pollution credits
- Advantages and disadvantages?

Coase Theorem

- How to allocate the radio spectrum to broadcasters?
- Give it away to someone, anyone!
- It doesn't matter. In an efficient market, you always arrive at the same end state.
- Nobel Prize, 1991
- Chicago School



Ronald Coase

Free-Market Environmentalism

- Overexploitation comes from multiple ownership
- Overconsumption is a flawed concept; the market regulates consumption by adjusting it according to supply
- Pollution occurs when victims are hindered from seeking tort restitution
- Regulation is inefficient and ineffective; violation is often seen as legitimate business practice

Destroy the commons!
Problem solved!!!

Amory Lovins

- Radical resource productivity: Using natural resources far more efficiently is both profitable and better for the environment.
- Biomimicry: Using nature as mentor, model, and measure yields superior design solutions that profitably eliminate waste, loss, and harm. Nature offers extraordinary design solutions honed by 3.8 billion years of rigorous testing; whatever didn't work was recalled by the Manufacturer.
- Service and flow economy: Providing appropriate services in place of direct product consumption—decreasing costs, hassles, and material waste. The concept entails a new perception of value, a shift from the acquisition of goods as a measure of affluence to an economy where the continuous receipt of quality, utility, and performance promotes well-being.
- Reinvestment in natural capital: Sustaining, restoring, and expanding stocks of natural capital will help reverse world-wide planetary destruction, so that the biosphere can produce more abundant ecosystem services and natural resources.



Globalization

- To globalize the economy by erasure of national economic boundaries through free trade, free capital mobility, and free, or at least uncontrolled, migration is to wound fatally the major unit of community capable of carrying out any policies for the common good.
- “Global competitiveness” (frequently a thought-substituting slogan) usually reflects not so much a real increase in resource productivity as a standards-lowering competition to reduce wages, externalize environmental and social costs, and export natural capital at low prices while calling it income.

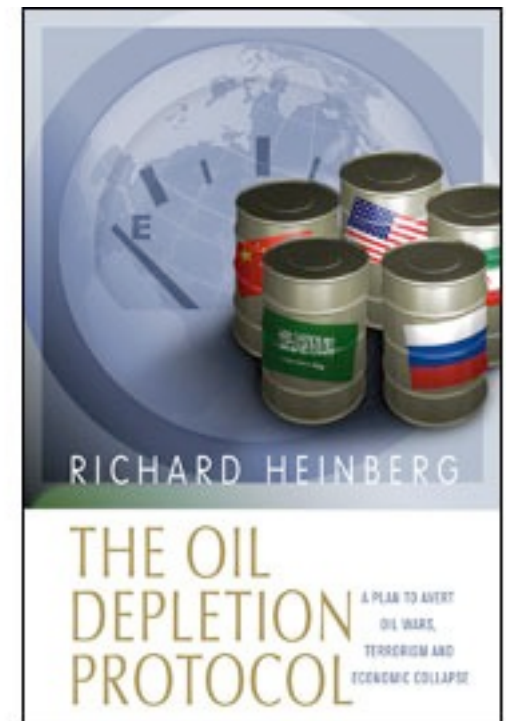
Political Constraints

“(Steven Chu, US Secretary of Energy) was my boss. **He knows all about peak oil, but he can’t talk about it.** If the government announced that peak oil was threatening our economy, Wall Street would crash. He just can’t say anything about it.”

— *David Fridley, scientist at Lawrence Berkeley National Laboratory, quoted in an article by Lionel Badal*

Oil Depletion Protocol

- The world and every nation shall aim to reduce oil consumption by at least the world depletion rate.
- No country shall produce oil at above its present depletion rate.
- No country shall import at above the world depletion rate.
- The depletion rate is defined as annual production as a percent of what is left (reserves plus yet-to-find).
- The preceding provisions refer to regular conventional oil—which category excludes heavy oils with cut-off of 17.5 API, deepwater oil with a cut-off of 500 meters, polar oil, gas liquids from gas fields, tar sands, oil shale, oil from coal, biofuels such as ethanol, etc.



Earl Cook (1982)

- Materials and energy balances constrain production.
- Affluence has been a much more fecund mother of invention than has necessity.
- Real wealth is by technology out of nature.
- The appropriate human **objective is the maximization of psychic income** by conversion of natural resources to useful commodities and by the use of those commodities as efficiently as possible. The appropriate measure of efficiency in the conversion of resources to psychic income is the human life-hour, with the calculus extended to the yet unborn.
- Physical laws are not subject to repeal by men.
- The industrial revolution can be defined as that period of human history when basic resources, especially nonhuman energy, grew cheaper and more abundant.
- The industrial revolution so defined is ending.
- There are compelling reasons to expect natural resources to become more expensive.
- Resource problems vary so much from country to country that careless geographic and commodity aggregation may confuse rather than clarify. That is, it serves no useful purpose to combine the biomass of Amazonia with that of the Sahel to calculate a per capita availability of firewood.