

Week 1: The Economic Way of Thinking

- I. Economics as Social Science
 - A. What is economics?
 - B. Narrow definition: economics is the scientific study of aspects of society in some sense closely connected to money.
 - C. Broad definition: economics is the scientific study of ALL aspects of society. It's just an historical accident that it isn't called "sociology"!
 - D. What's scientific about it?
 1. Making sure conclusions follow logically from assumptions.
 2. Checking *empirically* (i.e. by observation) whether and to what extent the assumptions and/or conclusions are true.
 3. *Compartmentalizing* questions of morality; put moral questions to one side, think about a topic in purely economic terms, and only then return to related moral questions.
 - E. Three simple points of logic:
 1. An argument is **valid** if its conclusions follow from its assumptions.
 2. An argument is **sound** if its premises are true AND it is valid.
 3. If an argument is valid and its conclusions are false, then at least one of its premises must be false (and therefore the argument is not **sound**).
 - F. A big difference between the economic approach and popular ones - and to a lesser extent other social sciences (political science, sociology) - is that economists work in two steps.
 1. First, carefully formulate valid theories (or "models").
 2. Then, turn to evidence to determine whether a theory is sound.
- II. Economics Versus Social Desirability Bias
 - A. Economics is unpopular. Why? Because some truths are ugly, and when the truth is ugly, economists generally say it anyway.
 - B. Example: How selfish are human beings? The ugly truth is: highly. And most economists say it anyway.
 - C. When the truth sounds bad, in contrast, psychologically normal people lie.
 - D. Furthermore, if the lies become pervasive enough, they stop sounding like lies. People say the pretty words without thinking hard enough to feel insincere.
 - E. The technical name for this in psychology: *Social Desirability Bias*.
 - F. Key to SDB: The gap between words and actions.
 - G. Illuminating example: Aborting a Down Syndrome baby:

"The decision to undergo an induced abortion varied depending on whether participants were prospective parents recruited from the general population (23%-33% would terminate), pregnant

women at increased risk for having a child with DS (46%-86% would terminate), or women who received a positive diagnosis of DS during the prenatal period (89%-97% terminated)." (*Journal of Midwifery and Women's Health*)

- H. Social Desirability Bias (SDB) is everywhere. Standard examples:
 - 1. Patriotism: "I'd gladly die for this country" versus actual evidence on self-sacrifice.
 - 2. Religion: "God is the most important thing in my life" versus actual church attendance rates.
 - 3. Political priorities: If you ask a politician, "Which should be our higher priority: children or disabled veterans," they dodge the question. Instead, they'll tell you something like, "Our great country can easily afford to give our children *and* our disabled veterans the very best possible care."
 - 4. Hyperbole: "If we stand together, victory is certain!"
 - 5. Price insensitivity: "We'll pay any price to save Ukraine" or "I'd do anything to help stop hunger."
 - 6. Moral causation: Blaming problems on "the rich" sounds a lot better than blaming problems on "the poor." Blaming foreigners sounds a lot better than blaming fellow citizens.
- I. You can even see SDB in basic grammar. If a friend asks you, "Would you like to come to my party?," the polite answer is the SDB-laden "Sorry, I can't." Which is almost always literally false. 99% of the time, you *can*, but have something better to do.
- J. The "Want to bet?" challenge to SDB.
- III. The Analytical Framework: Preferences and Constraints
 - A. Economists begin all analysis by making a distinction between **preferences** and **constraints**.
 - B. Some synonyms for preferences: tastes, likes, rankings. For any two hypothetical possibilities, A and B, a person either **prefers** A to B, B to A, or is **indifferent** between A and B.
 - C. Some synonyms for constraints: budget, choice set, menu. There is always a set of conceivable things that are actually available, and another set that aren't.
 - D. From Apollo 13: "You're telling me what you want. I'm telling you what you've got."
 - E. All of economics comes back to thinking carefully about individuals' preferences and constraints.
 - F. When someone's behavior changes, it could be because his preferences changed, or because his constraints changed.
 - G. "I can't" versus SDB.
- IV. The Nature of Preferences: Human Selfishness
 - A. At the most abstract level, economists make no assumptions about what preferences have to look like.
 - B. In practice, however, economists almost always make the strong assumption that *people are almost entirely selfish*. They place vastly more weight on the well-being of themselves and their family than they do on the well-being of strangers.

- C. Why do economists assume this? To repeat: Because it is basically true!
- D. What percentage of their disposable income do people spend on themselves?
- E. Evolutionary interpretation: unselfish beings would not have survived.
- F. However, what economists take with one hand they give back with the other: Selfish people will often treat other people very well.
- G. Why? It is often **in your interest** to be nice to other people!
 - 1. Ex: Waiting tables.
- H. Thus, selfish **intentions** may still produce cooperative **results**. Classic statement in *Wall St.* speech: "Greed is good." This distinction between intentions and results frequently appears in economics.
- I. Exceptions to selfishness: aren't there a lot of counter-examples?
- J. Family-based examples don't count - evolution does select for concern for blood relatives.
- K. Friendship etc. might count - but almost invariably these relations involved reciprocity - you scratch my back, I'll scratch yours.
- L. Still, there remain plenty of examples where people help strangers who have no prospect of ever returning the favor.
- M. *But are they a big fraction of human motivation?* No - quantitatively, it is a tiny fraction of what goes on. Nice statement: Tullock's law states that 95% of human motivation is selfish. There are exceptions, but they are a small corner of the world.
- V. Scarcity: the Origin of Constraints
 - A. People always face constraints. Why?
 - B. In a word, **scarcity**. People's wants always outrun what is physically possible.
 - C. People sometimes speak as if scarcity does not exist, but there are clear inconsistencies in their thinking. "Deleting a message takes no effort."
 - D. Once a good becomes very abundant, scarcity re-surfaces along the dimension of quality. There is unlimited "air," but not unlimited air-conditioned or heated or filtered air.
 - E. Flip side of scarcity: **opportunity costs**. Opportunity costs are what you had to give up or sacrifice in order to get what you did.
 - F. The key idea of opportunity cost is to fully tally up what your "2nd-best" choice would have given you, not just "out-of-pocket" costs.
 - 1. Ex: Attending college.
 - G. Economists' variant on the popular concept of "profit" adjusts for opportunity costs. When economists say "profit," they mean **economic profit** - earnings in excess of your 2nd-best choice.
 - 1. Ex: If a business owner's revenues exceeded his out-of-pocket expenses by \$30,000, did he make a profit?

- H. Opportunity cost is the central theme of the Bastiat essay "What Is Seen and What Is Not Seen." Read it. It's great.
- VI. Scarcity and a Brief History of Progress
 - A. Scarcity is all around us, but it is true that humans' constraints are much looser than they were in the past.
 - B. For most of human history, living standards were **extremely** low.
 - 1. Lifespan: 20-30 years.
 - 2. Child mortality: 40-60% died before the age of 5.
 - 3. Long hours of hard physical labor necessary to stay alive; almost all resources devoted to survival.
 - C. To sum up: during this period of pre-history, human population seems to have been roughly constant, and living standards around the "subsistence level." That is, if they got much poorer, they wouldn't have remained alive.
 - D. During the last 1% or so of human history, this stable pattern has radically changed:
 - E. The *average* living standard is incredibly high compared to the subsistence level.
 - 1. Lifespans: 65-75 years for poorer countries; 75-85 for richer countries.
 - 2. Child mortality: Around 4% die before age 5 in poorer countries, about 1% in richer countries.
 - 3. Average hours of work are much lower, labor on average is much less physically demanding, and a much smaller fraction of labor is devoted to survival.
 - 4. Quantifying the change in living standards is somewhat complicated:
 - a) Quality and availability of goods.
 - b) Non-market goods.
 - c) Leisure.
 - 5. A low estimate: 40x increase in per-capita real income in richer countries. 5x increase in poorer countries.
 - 6. More speculative estimate: 1000x in richer countries, 10x in poorer countries.
- VII. Incentives: Thinking Strategically About Your Constraints
 - A. Is that all there is to the fundamentals of economics - selfish preferences and scarcity-induced constraints?
 - B. In general terms, yes. But there is more to the constraints than meets the eye.
 - C. Looking at constraints strategically, you can see that constraints create **incentives** for certain kinds of behavior rather than others.
 - D. Suppose you have 24 hours' worth of time, and get paid \$10 per hour. Then from one perspective, you face an income-leisure constraint:

Leisure (hours)	Income (\$'s)
24	0
20	40
16	80
12	120
8	160
4	200
0	240

- E. This is a pretty simple strategic problem, but there is a problem: "The more I work, the more income I earn. That's my incentive to work."
- F. But suppose it were a more complicated constraint, where you earn \$10 per hour for the first 8 hours, but earn "time-and-a-half" for additional hours. Then your menu looks like:

Leisure (hours)	Income (\$'s)
24	0
20	40
16	80
12	140
8	200
4	260
0	320

- G. Now you have to think: "If I work for 0 to 8 hours, I earn \$10/hour. But if I keep working after that, my incentive to work another hour goes up!"
- H. To consider an example closer to home, think about how students' grade-leisure constraint sparks strategic thinking.

VIII. Incentives and Marginal Analysis

- A. Probably the best illustration of how to think strategically about incentives is what economists call **marginal analysis**.
- B. What is marginal analysis? It consists in considering the effects of small changes on outcomes.
- C. Ex: Suppose I write one less article. How will that change my chances of getting tenure?
- D. Ex: Suppose you skip one class. How will that change your final grade?
- E. Often, people reason: writing articles is important for tenure, so I should write articles; or, going to class is important for getting a good final grade, so I should always go to class.
- F. But this doesn't follow. The real question is not: Should I write at all, but how much should I write? I might have so few articles that I have no chance for tenure. Then the marginal benefit of writing another article is zero. Alternately, I might have so many publications that I'm a shoo-in. Then again, the marginal benefit of writing another article is zero!

- G. While people often talk as if they didn't understand marginal analysis, most people act as if they did most of the time.
- H. Ex: Perfect versus good enough.
- I. There are many applications of marginal analysis:
 - 1. Marginal utility
 - 2. Marginal benefit
 - 3. Marginal cost
 - 4. Marginal productivity
 - 5. Marginal impact on probability of success
- IX. The Principle of Diminishing Marginal Utility
 - A. Suppose Crusoe is on an island and has a number of different things he'd like to do, each requiring a bag of grain. He ranks his wants from first to last:
 - 1. Eat today
 - 2. Plant for tomorrow
 - 3. Feed parrot
 - 4. Keep hut dry
 - B. If he just has one bag, what will he do? Eat, of course. If another washes up on shore? Plant for tomorrow. A third? Feed the parrot.
 - C. Suppose the bag he was planning on eating washes out to sea? Does he just stay there hungry? No: He eats the parrot's food instead!
 - D. Thus, as the stock of grain increases, the marginal bag is used for a less and less valued task.
 - E. In general terms, this is the Principle of Diminishing Marginal Utility: The marginal utility (or marginal value, or marginal usefulness) of a good decreases as the quantity increases.
 - F. Exercise: Reverse this logic for unwanted bads to get a Principle of Increasing Marginal Disutility.
- X. Marginal Analysis and the Indifference Principle
 - A. An amazing implication of marginal analysis: It makes sense to keep reallocating your resources until additional small changes leave you completely indifferent.
 - B. Exercise: Allocate your time between TV and study.
 - 1. Step 1: If studying one more minute and watching TV one less minute would make you happier overall, reallocate one minute from TV to study.
 - 2. Step 2: If studying one fewer minute and watching one more minute of TV would make you happier overall, reallocate one minute from study to TV.
 - 3. Step 3: If you reallocated any time in Step 1 or Step 2, repeat.
 - C. Amazing conclusion: You will have to be indifferent "at the margin"! As you reallocate from study to TV, the marginal utility of study

keeps rising, and the marginal utility of TV keeps falling, until you "equalize at the margin."

- D. This works more generally: Suppose there are two jobs, one that is hot and unpleasant, the other that is cool and pleasant. Which job is better to have?
- E. To keep workers at the unpleasant job, employers will have to raise their wages. They will keep raising them until the marginal employee is indifferent between a high-paid, unpleasant job, and a low-paid, pleasant job.
- F. Try this for real estate. Is there a "best place to live"? Why doesn't everyone live there?!

Week 2: Trade and Property Rights

- I. Selfishness and Cooperation
 - A. Many people assume that selfish people are uncooperative people.
 - B. But this is hardly a clear matter. A selfish person will eagerly cooperate with another person so long as cooperation is more personally beneficial than conflict.
 - C. Ex: We are alone on an island. If I'm selfish, will I necessarily steal from you?
 - D. When you think about this more critically, a great deal of supposedly unselfish behavior becomes easier to interpret in terms of self-interest.
 - 1. Friendship
 - 2. Politeness
 - E. This doesn't mean that there is no unselfish component, but that the difference between the way the current world looks and the way it would look if everyone were completely selfish is not so great.
- II. Trade As Mutual Benefit
 - A. If I gain from cooperating with you, it is in my selfish interest to do so. But doesn't this imply that it WON'T be in your selfish interest to cooperate with me?
 - B. This question assumes we are playing what is called a "zero-sum game," such as a race.
 - C. Zero-sum games are however quite rare. Much more often, there are positive-sum games - where the total gain of cooperation exceeds the total gain of conflict.
 - 1. Yes, there are also negative-sum games, like war.
 - D. In positive-sum games, selfish agents naturally tend to TRADE to realize these benefits.
 - E. The whole idea of trade is that I have B, you have A, I prefer A to B, and you prefer B to A. Then if I give you B in exchange for A, we are both better off!
 - F. Innumerable examples:
 - 1. Buying lunch.
 - 2. Buying a house.
 - 3. Selling labor.
 - 4. Buying insurance.
 - 5. Getting married.
 - G. Simple statement: When selfish agents trade, all of the traders expect to be better off; otherwise they wouldn't have agreed to the bargain.
- III. Comparative Advantage

- A. It's easy to see how trade works if two people have different strengths.
 - 1. Ex: Trading Antarctic ice for tropical fruit
- B. But what if one side is better across the board? What's the point of trading then?
- C. Surprisingly, mutually advantageous trade is still totally possible.
- D. Intuitively: Suppose the world's best brain surgeon is also the world's fastest typist. Should he still hire a secretary?
- E. Numerical example: Suppose that in a day, American and Mexican women can produce:

	American Woman	Mexican Woman
Computer Programs Written	4	.1
Children Cared For	2	2

- F. Both sides can increase production by immigration and specialization! Have ten Mexican women switch from writing computer programs to childcare (-1 program, +20 childcares), and one American woman switch from childcare to computer programs (+4 programs, -2 childcares). The world is richer by 3 programs and 18 childcares.
- IV. Exploitation Fallacies: Better-Off Versus Well-Off
- A. All this seems obvious, but a great deal of intellectual energy has been devoted to denying it. The most common version is to label trade as "exploitation" of one party by another.
 - B. Ex: I hire you to mine coal for \$1/day.
 - C. Ex: I charge you \$10,000 for a glass of water in the desert.
 - D. Isn't this "exploitation"?
 - E. Fallacy of exploitation is inference from "Bryan is not doing well after this trade" to "Bryan is not better off as a result of this trade."
 - F. After I trade \$10,000 for a glass of water, my position is still unpleasant. But am I better off for having a glass of water more and \$10,000 less? Of course.
 - G. The charge of "exploitation" makes more sense if you first CAUSE my problem, and then trade with me to get rid of it! Ex: Slavery.
 - H. But if I would have had my problem whether you existed or not, your offer to trade with me can't make me worse off.
 - I. Suppose I work for you for \$1/day. Why should I blame you? You are offering me more than anyone else! If I should blame anyone, it is all of the other people who won't outbid you.
 - J. Ex: Low-paid workers shouldn't blame foreign investors; if anyone, they should blame foreigners who *don't* invest in their country.
 - K. Numerous other examples where this charge of exploitation surfaces:
 - 1. Foreign "dumping"
 - 2. Slumlords
 - 3. Used pacemaker (*Law and Order*)
 - 4. Unapproved drugs

- 5. Narcotics
 - 6. Prostitution
- V. Paternalism and Trade
 - A. A quite different argument from the "exploitation" one is the **paternalistic** argument that *people are mistaken about their own interests*.
 - B. Key idea: Put the blame on the folly of the "loser," rather than the greed of the "winner."
 - C. Unlike the exploitation argument, the paternalistic argument is at least coherent.
 - D. Some economists define this problem away, which doesn't strike me as very plausible.
 - E. Other replies:
 - 1. Individuals normally know their own interests best; often it is the "do-gooder" who is the fool. Individuals may just be making the best of a bad situation.
 - 2. People are extremely diverse, that doesn't make them idiots.
 - F. Replies to replies:
 - 1. We are all foolish some of the time; we need to protect our "smart" selves from our "dumb" selves.
 - 2. Other people have to pay for the bad risks people assume.
 - G. On balance, I don't see much force to paternalistic arguments most of the time, but it is a caveat to keep in mind for future reference.
- VI. Trade and Reciprocal Altruism
 - A. How much "trade" is really going on? Probably more than you realize. Much of what appears to be simple unselfishness or altruism is actually "reciprocal altruism" - trade in disguise.
 - B. Origin in biology: One chimp grooms another, then they reverse roles. Or vampire bats share extra blood.
 - C. With humans, there are many areas where people are trading favors over time.
 - 1. Family
 - 2. Work
 - 3. Friends
 - D. Key test: If you stopped responding, would the other person still keep giving favors to you?
 - E. Thus, the analysis of trade has a broader application than it first appears.
- VII. Trade as Technology
 - A. The Iowa car crop
 - B. Alone on an island, Crusoe has many technologies for producing wealth.
 - C. Key lesson: Trade is just an *additional* technology from Crusoe's point of view. The fact that it involves other people (like Friday) is actually *irrelevant* from the point of view of a selfish actor!

- D. From a purely selfish point of view, people who refuse to trade are just hurting themselves. (Of course, they are hurting potential trading partners as well...)

VIII. Property Rights

- A. All of this talk of trade implicitly supposes that the traders have "property rights" - that they are trading things that are theirs to dispose of to begin with.
- B. Like trade, people often think of property in terms of "exploitation."
- C. Economists' standard reply:
- D. Respecting property rights provides the incentive for people to:
 - 1. Produce more things
 - 2. Maintain things they do have
- E. In other words, without property rights, the property probably wouldn't have existed in the first place. (The physical matter of course would exist in any case, but its usefulness to people is another thing altogether!)
- F. The case of unsettled land: what incentives do property rights in land create here?

IX. Profit-Maximization

- A. There is a crucial distinction between **accounting profits** and **economic profits**! Economic profits count opportunity cost of capital and labor; accounting profits don't.
- B. The accounting approach eliminates a lot of judgment calls, but it's classic "Looking for your keys under the streetlight because it's brighter there." Who cares if your home business made an accounting profit of \$100,000, if you ignore the fact that you could have made \$200,000 by working for someone else? Who cares if you made a 3% accounting profit on your investment, if you could have made 6% in the stock market?
- C. In this class, "profit" means "economic profit" unless stated otherwise.
- D. Most businesses try to make money, and the more that businesses prioritize making money, the more likely they are to survive and expand.
- E. Result: Businesses tend to "*maximize* profits." They're trying to make the difference between total revenue and total cost as large as possible.
- F. Doesn't this lead businesses to charge sky-high prices? Not necessarily. Maybe they make more money by selling high quantities at low prices.
- G. Doesn't this lead businesses to cut corners? Not necessarily. Maybe they make more money by selling high quality products for high prices.
- H. The essence of profit-maximization: being all of the following at the same time:
 - 1. Cost-conscious

- 2. Consumer-conscious
 - 3. Risk-conscious
- I. A lot of SDB attacks all three aspects, but on reflection they are highly socially functional.
- X. The Tragedy of the Commons
 - A. It is *possible* for something to be unowned. This has frequently happened. For example, a pasture may be "common property." Oceans are normally unowned, accessible to all.
 - B. Frequently, however, common ownership gives rise to what economists call the "tragedy of the commons." Since no one owns it, people use it without regard to the effect on others.
 - C. And, once you realize that people think this way, you also have an incentive to take as much as possible NOW, because the resource won't be useful very long. This can "snowball" into an awful outcome that benefits no one.
 - D. Key idea: If one person owned the fisheries, or a forest, or a pasture, they would have the incentive to maintain it, improve it, and take a long-term perspective.
 - E. That is the benefit of property rights that is absent in the commons - a benefit not just for owners, but for users as well.

Week 3: Supply and Demand

- I. Markets and Trade
 - A. The simplest examples of trade involve just two parties.
 - 1. Ex: I want to exchange bread for dollars, you want to exchange dollars for bread.
 - B. But it is not too hard to imagine there being a lot of would-be bread-buyers and bread-sellers.
 - C. There are physical places where would-be buyers and sellers gather to trade. These are often called "marketplaces" or just "markets." Ex:
 - 1. Farmers' market
 - 2. Stock market
 - D. From these **observed** markets, it is not too hard to make a leap to **conceptualized** markets.
 - 1. Ex: The Internet. No one is physically meeting, but it is easy to analogize it to a simple farmers' market.
 - E. Conceptualizing diverse activities as "markets" is probably the most important intellectual leap in economics. Economics has a "pre-packaged" set of intellectual tools for dealing with all such "markets," known as "supply-and-demand."
- II. Supply and Demand, I: Setting Up the Problem
 - A. Mentally separate (or "partition") sellers and buyers.
 - 1. Sellers are "the supply."
 - 2. Buyers are "the demand."
 - B. Label axes. Put **quantity** exchanged on the x-axis, and the market **price** on the y-axis.
 - C. What does a demand curve look like? The higher the price, the fewer items (smaller quantity) demanders will want to buy.
 - D. Why?
 - 1. Try introspecting.
 - 2. Think in terms of diminishing marginal utility.
 - E. What does a supply curve look like? The higher the price, the more items (larger quantity) suppliers will want to sell.
 - F. Why?
 - 1. Try introspecting.
 - 2. Think in terms of increasing marginal disutility.
- III. Supply and Demand, II: Putting It Together
 - A. Now just put the S and D curves together on the same graph.
 - B. What can be learned? The market tends to be at the **intersection** of S and D! Economists call this intersection the "equilibrium price."
 - C. Why?

- D. Suppose the market price exceeds the equilibrium price. Then people want to sell MORE than people want to buy. So what should a seller do, in his own interest? Slightly cut the price to sell a much larger quantity!
 - E. Suppose the equilibrium price exceeds the market price. Then people want to buy MORE than people want to sell. So what should a buyer do, in his own interest? Offer a slightly higher price, to be able to buy all that he desires!
 - F. What if there were a whole bunch of different prices? Then buyers paying more than average could just switch sellers, and sellers getting less than average could just switch buyers.
 - G. Thus, the amazing result that only the intersection of S and D is stable. That is why we call it the **equilibrium** price - it is the only price that markets don't tend to move away from.
 - H. Additional amazing result: At the market equilibrium, all gains to trade - the difference between the D and the S curves - are realized. (Consider analogy to one-on-one trade).
 - 1. Area between the D curve and the price is called "consumers' surplus." It shows the difference between consumers' maximum willingness to pay, and the amount they actually pay.
 - 2. Area between the S curve and the price is called "producers' surplus" (or "economic profits"). It shows the difference between producers' minimum willingness to accept, and the amount they actually get.
- IV. Supply and Demand, III: Shifts
- A. There are four kinds of shifts that can happen.
 - B. Shift #1: Demand Increases. Ex: A fad for kiwis.
 - C. Shift #2: Demand Decreases. Ex: People find out kiwis cause bad breath.
 - D. Shift #3: Supply Increases. Ex: Innovations in kiwi fertilizer.
 - E. Shift #4: Supply Decreases. Ex: The price of gas rises, making transportation of kiwis more expensive.
 - F. Shifts versus movements along a curve. Students often have trouble translating changes correctly. They will say "demand increases" when what actually happens is that demand stays the same, supply increases, and thus the quantity demanded increases.
 - G. Simple point: A shift in one curve necessarily implies movement along the other.
 - H. How to tell the difference. Think about whether the posited change makes people WANT a good more or less. If so, it's a D change. On the other hand, it makes people less willing to PRODUCE a good, it's a S change.
 - I. Canonical table.

Shift	Price	Quantity
D increases	+	+
D decreases	-	-
S increases	-	+
S decreases	+	-

J. What about combined shifts?

Demand	Supply	Price	Quantity
+	+	?	+
+	0	+	+
+	-	+	?
0	+	-	+
0	0	0	0
0	-	+	-
-	+	-	?
-	0	-	-
-	-	?	-

K. Canonical shifters of demand versus supply:

Demand Shifters	Supply Shifters
Tastes	Technology
Prices of substitutes/ complements	Input prices
Income	Taxes/subsidies/regulation
Number of buyers	Number of sellers

L. The interrelatedness of markets: A shift in one market sets off additional shifts in other markets.

- Ex: The supply of DVD players increases. How do the effects in the DVD market "ripple out" to other markets? Which others? How much?

M. Expectations: If people expect prices to change, they start changing right away.

V. Elasticity

- Economic theory by itself only tells us the sign of the slopes of D and S, not their shape.
- But: We have an intuitive sense that the shape varies a lot from market to market.
- Economists formalize this notion of shape with the concept of "elasticity." If a curve is vertical, we call it "perfectly inelastic," if it is horizontal we call it "perfectly elastic." The flatter it gets, the "more elastic" it is; the steeper it gets, the "more inelastic" it is.
- Consider some polar cases:
 - Perfectly elastic demand curve.
 - Perfectly inelastic demand curve.
 - Perfectly elastic supply curve.
 - Perfectly inelastic supply curve.

- E. Elasticity determines how much a shift changes quantity versus price.
 - 1. If D increases and S is perfectly inelastic, then price rises and quantity doesn't change.
 - 2. If S increases and D is perfectly inelastic, then price falls and quantity doesn't change.
 - 3. If D increases and S is perfectly elastic, then price stays the same and quantity rises.
 - 4. If S increases and D is perfectly elastic, then price stays the same and quantity rises.
- F. What goods have...
 - 1. ...very elastic demand?
 - 2. ...very inelastic demand?
 - 3. ...very elastic supply?
 - 4. ...very inelastic supply?
- VI. Price Controls
 - A. Governments are often unhappy about what the equilibrium price in a given market is. Oftentimes, especially with high SDB, they respond by imposing "price controls."
 - B. If they want the market price to be lower, they impose a price ceiling (or price maximum).
 - 1. Ex: During WWII, and again during the '70s, there were economy-wide price ceilings imposed.
 - 2. Ex: During the '70s, the price of gas and oil was capped.
 - C. What does S and D analysis predict will happen? With the price fixed below the equilibrium level, D exceeds S - a condition known as a **SHORTAGE**.
 - D. This leads to some form of *rationing* of buyers.
 - 1. Simplest form: Suppliers decide.
 - 2. Alternate: Standing in line ("queuing").
 - 3. Alternate: Government ration tickets.
 - E. What other effects would S and D analysis predict?
 - 1. Corruption.
 - 2. Increased search effort by demanders.
 - 3. Quality reductions by suppliers.
 - F. How well does the S and D model work in explaining the effects of price ceilings? Very well indeed.
 - 1. Ex: Gasoline price controls.
 - 2. The case of Berkeley.
 - G. If governments want market prices to be higher, they impose a price floor (or price minimum).
 - 1. Ex: In agriculture since the '30s.
 - 2. Ex: The minimum wage.
 - H. What does S and D analysis predict will happen? With the price fixed above the equilibrium level, S exceeds D - a condition known as a **SURPLUS**.

- I. This leads to rationing of *sellers*.
 - 1. Simplest form: Demanders decide.
 - 2. Alternate: Government licensing.
 - 3. Alternate: Government buys surplus.
 - J. What other effects would S and D analysis predict?
 - 1. Corruption.
 - 2. Increased search effort by suppliers.
 - 3. Quality *increases* by suppliers.
 - K. How well does the S and D model work in explaining the effects of price floors? Again, quite well.
 - 1. Ex: Airline regulation.
 - 2. Ex: Minimum wage in the U.S.
 - 3. Ex: European unemployment.
 - L. Why are price controls so popular? There are always some beneficiaries, but the widespread public sympathy is hard to explain as anything other than a product of lack of economic understanding.
- VII. Entry and Exit
- A. A further effect of price controls is to induce entry and exit of firms into the market.
 - 1. Price ceilings induce...?
 - 2. Price floors induce...?
 - B. This is just part of a more general pattern:
 - 1. When firms in an industry are earning **economic profits**, this attracts new entrants.
 - 2. When firms in an industry are earning **economic losses**, this induces exit (sometimes in the form of bankruptcy).
 - C. Entry and exit stop when Price=Average Cost. Remember, economic profit includes the opportunity costs of labor and capital!
 - D. This is how markets move resources from industry to industry. When demand increases, this temporarily leads to economic profits, but at the same time induces new entry.
 - E. When demand decreases, this temporarily leads to economic losses, but at the same time induces exit.
 - F. People often lament exit and bankruptcy, but what is the alternative? A world where production fails to respond to desires.
 - G. How should this be diagrammed? Distinguish between "long-run" and "short-run" demand and supply elasticity. Elasticity is normally greater in the long-run because people find substitutes and otherwise rearrange their affairs to take advantage of changes in their budget set.
- VIII. Exercise: Name an Industry
- A. Name an industry. Let's try to analyze it in S and D terms.

Weeks 4-5: Taxation, Redistribution, and Cost-Benefit Analysis

- I. The Concept of Incidence
 - A. If market conditions change, who is most affected? Least affected? Economists call these questions of *incidence*.
 - B. People tend to totally ignore incidence questions, treating them as obvious. In fact, though, determining incidence is an extremely difficult and subtle question.
 1. Ex: Air Travelers' Bill of Rights
 - C. A standard incidence question: Who ultimately pays a given tax?
 - D. People often just look at the law.
 - E. For example, some sales taxes just add 5% onto consumers' bill. People tend to think that consumers pay these. Other sales taxes are "included in the price." Do consumers indirectly wind up paying these too?
 - F. If the income taxes go up, does that make employers give you a raise?
 - G. Another example: shoplifting. Most people seem to believe that the real victims of shoplifting are not store-owners, but consumers, who pay a higher price for the goods they purchase.
 - H. On the other hand, if a storeowner decides to smash up his own store (and doesn't have insurance), few people would blithely say "He can just raise his prices."
 - I. What are the general principles of incidence? We are going to explore these with a focus on the incidence of taxation, then try to generalize from there.
- II. Two Viewpoints on Taxation: Suppliers' and Demanders'
 - A. Suppose the government imposes a \$1/unit tax.
 - B. From the sellers' viewpoint, this just looks like a fall in demand. For any given price the *sellers* offer, customers buy less.
 - C. But: From the demanders' viewpoint, this looks like a fall in *supply*. For any given price the *buyers* offer, suppliers sell less!
 - D. From the sellers' viewpoint, then, price falls and quantity falls. But from buyers' viewpoint, price rises and quantity falls.
 - E. So which group is correct? Both! Amazingly, *as long as you keep your definitions clear*, both viewpoints yield identical answers.
 - F. Diagrammatic explanation, using tax wedges.
 - G. Algebraic version:
 1. P =observed price tag
 2. P^S =price paid to suppliers
 3. P^D =price paid by demanders
 4. t =per-unit tax

- H. Assume:
1. S: $Q = a + bP^S$
 2. D: $Q = c - dP^D$
- III. Taxation Analyzed from the Suppliers' Versus Demanders' Viewpoint
- A. Suppose the law says that "sellers have to pay the government a tax of t per unit sold." The tax is thus "included in the price."
- B. Then:
1. $P^D = P$
 2. $P^S = P - t$
- C. Substitute in for P^S and P^D to get two equations in 2 unknowns:
1. S: $Q = a + b(P - t)$
 2. D: $Q = c - dP$
- D. Solve for P : $P = [-a + c + bt] / [b + d]$
- E. Suppose instead that the law says that "consumers have to pay the government a tax of t per unit sold." The tax is thus "added onto the price."
- F. Then:
1. $P^D = P + t$
 2. $P^S = P$
- G. Substitute in for P^S and P^D to get two equations in 2 unknowns:
1. S: $Q = a + bP$
 2. D: $Q = c - d(P + t)$
- H. Solve for P : $P = [-a + c - dt] / [b + d]$
- I. And what is $(P + t)$? $P + t = [-a + c - dt] / [b + d] + t = [-a + c + bt] / [b + d]$
- IV. What These Equations Mean, I
- A. Notice: the price tag when sellers pay the tax exactly equals the price tag plus the tax when buyers pay the tax!
- B. It only takes a little more work (not shown) to prove that Q is the same no matter who legally pays the tax.
- C. Conclusion: *It is not tax law, but economic law that determines who pays a tax.*
- D. Looking more closely, what do these equations tell us?
- E. Suppose that supply is perfectly inelastic; i.e., $b = 0$. *Then the full burden of taxation falls on suppliers.*
1. If suppliers legally pay tax, then observed price tag $P = [-a + c] / d$; i.e., no matter what taxes are, the price tag says the same thing. In other words, sellers absorb 100% of the tax.
 2. The same holds if demanders legally pay tax. Then observed price tag $P = [-a + c - dt] / d$. I.e., the coefficient on t is -1 , indicating again that sellers absorb 100% of the tax. If the sales tax rises by \$1, the pre-tax price falls by exactly \$1.
- F. Suppose instead that supply is perfectly elastic; i.e., $b = \infty$. (That may be a little too scary, so I'll just put in $b = 1,000,000$). *Then the full burden of taxation falls on demanders.*
1. If suppliers legally pay tax, then observed price tag $P = [-a + c + 1,000,000t] / [1,000,000 + d]$. I.e., the coefficient on t is

approximately equal to +1. Raise the tax by \$1, the price tag rises by \$1, leaving suppliers' earnings unchanged.

2. The same holds if demanders legally pay tax. Then observed price tag $P = [-a + c - dt] / [1,000,000 + d]$. I.e., the coefficient on t is approximately 0. Thus, raising the tax by \$1 raises $(P + t)$ by \$1, indicating that buyers pay 100% of the tax.

G. General principle: The more elastic supply gets, the smaller suppliers' tax share becomes. Tax share ranges from 0% for perfectly elastic supply curves to 100% for perfectly inelastic supply curves.

H. Intuition: Mobile resources are elastically supplied. Thus, if you raise taxes on them, they flee into other activities. In contrast, immobile resources are inelastically supplied. If you raise taxes on them, resource owners just "grin and bear it."

I. More intuition: The narrower a tax is, the more untaxed alternatives there are. To avoid a tax, a resource has to be not just mobile, but mobile *between the taxed and the untaxed sectors*.

J. Examples:

1. Income taxation on all workers
2. Extra income taxes on lawyers
3. Tax on ski equipment
4. Tax on land
5. Tax on oranges sold in California
6. Tax on oranges sold in the U.S.
7. Picasso paintings

V. What These Equations Mean, II

A. Next, consider demand. Suppose that demand is perfectly inelastic; i.e., $d = 0$. *Then the full burden of taxation falls on demanders.*

1. If suppliers legally pay tax, then observed price tag $P = [-a + c + bt] / [b + d]$. The coefficient on $t = 1$, indicating that the price tag rises by \$1 if the tax rises by \$1.

B. Suppose instead that demand is perfectly elastic; i.e., $d = \infty$. (Again, I'll just approximate this by setting $d = 1,000,000$). *Then the full burden of taxation falls on suppliers.*

1. If suppliers legally pay tax, then observed price tag $P = [-a + c + bt] / [b + 1,000,000]$. I.e., the coefficient on t is approximately equal to 0. Raise the tax by \$1, the price tag stays the same; demander pays none of the tax.

C. General principle: The more elastic demand gets, the smaller demanders' tax share becomes. Tax share ranges from 0% for perfectly elastic demand curves to 100% for perfectly inelastic demand curves.

D. Intuition: Products with good substitutes (and products that consumers are very willing to simply "do without") are elastically

demand. Thus, if you raise taxes on them, consumers switch to other products or do without. In contrast, products without good substitutes are inelastically demanded. If you raise taxes on them, demanders just endure the higher price.

E. More intuition: The narrower a tax is, the more good substitutes there are. To avoid a tax, consumers need good *untaxed* substitutes.

F. Examples:

1. Soap
2. Electricity
3. Perfume
4. Movies
5. Gas
6. Residence in California
7. Residence in Virginia

VI. More on Incidence

A. In the real world, all markets are interconnected, which complicates the analysis of incidence. But the principles stay the same: No matter what the tax laws say, taxes are actually paid by immobile resources and avoided by mobile resources.

B. For example, if you tax airline tickets, some producers are highly mobile (investors), while others are much less mobile (pilots). So the incidence of this tax might be borne evenly by passengers and pilots, while investors escape.

C. Everything said about taxes applies just as well to all other government policies.

1. Ex: If landlords have to give tenants 3 months' notice before eviction, who pays?

2. Ex: If car owners have to install air bags, who pays?

D. In fact, everything said about government policies also holds for ALL market fluctuations.

1. Ex: If Picasso suddenly becomes more popular, who benefits?

2. Ex: If I suddenly strike new oil, who benefits?

3. Ex: If you relax copyright protection, who benefits?

E. Exercise: Name any change in market conditions. Then let's analyze the incidence of this change.

VII. Transfers Versus Deadweight Losses

A. Landsburg on "Why Taxes Are Bad": suppose I am willing to pay \$20 for a shirt that sells for \$18 untaxed. Raise the tax from \$0 to \$1 - and you transfer \$1 from me to the government. Raise the tax from \$0 to \$1.99 and you transfer \$1.99 from me to the government. But raise the tax from \$0 to \$2.01, and you take \$2.00 from me *without doing anything for the government*. You raise no revenue because I didn't buy. But I am nevertheless worse off due to my loss of consumers' surplus.

- B. Two lessons about taxation:
 - 1. Obvious lesson: Taxes make some people poorer and other people richer.
 - 2. Non-obvious lesson: Taxes make some people poorer without making *anyone* richer.
 - C. Economists call the obvious effects "transfers," and the inobvious ones "deadweight losses."
 - D. Diagrammatic explanation, showing CS, PS, revenue, and DW loss.
 - E. Now: how much revenue does the government raise from a sales tax? Mathematically, tQ .
 - F. So you might think that lost (consumers' surplus + producers' surplus) would add up to tQ .
 - G. Wrong! The total loss to consumers and producers is always MORE than tQ .
 - H. Why? Recall that total gains to trade are greatest at the intersection of the (untaxed) S and D curves. Call that quantity Q^* .
 - I. Taxes reduce the equilibrium quantity to Q^* . This means that the gains to trade for all of the units from Q^* to Q are lost, *without raising any revenue for the government*.
 - J. The rectangle tQ^* is a transfer to the government. The triangle between Q^* and Q is a deadweight loss.
 - K. The more elastic both supply and demand are, the worse deadweight losses get. (Remember further that elasticity usually increases in the long-run, so the consequences of bad policies intensify over time).
 - L. Other examples:
 - 1. The leaky bucket
 - 2. Piracy
 - 3. Theft
- VIII. Deadweight Losses and Cost-Benefit Analysis
- A. Non-economists tend to see everything as transfers, and to ignore the possibility of deadweight costs. So policy debates are just about "Which side are you on?" rather than "Which policy is better overall?"
 - B. Once you take deadweight losses seriously, however, you can ask, "How can we *minimize* deadweight losses?"
 - C. Or more positively, how can we *maximize* the sum of benefits minus costs. This is the core idea of Cost-Benefit Analysis, or CBA.
 - 1. Talk about "economic efficiency" is basically synonymous.
 - D. Every government policy has a long list of effects.
 - 1. Intended outcomes
 - 2. Unintended outcomes
 - 3. Direct costs
 - 4. Indirect costs
 - E. Question: Is government policy X worth doing?

- F. Cop-out answer: It's all a matter of opinion/depends on your values/there's no right or wrong answer here.
- G. The CBA alternative: Put a dollar value on (or "monetize") all costs and all benefits. Then sum up.
- H. How can you put a dollar value on something that no one buys or sells? By asking, "How much *would* people pay for this?" or "How much *would* people pay to avoid this?"
- I. How can you find out what people *would* pay if they don't actually pay?
 - 1. Ideally: telepathy.
 - 2. Or: asking them.
 - 3. Better: inferring from their behavior. E.g., how much extra do people pay to live in a neighborhood with 10% less crime?
- J. Actual governments very rarely use CBA. For fiscal years 2003-2013, the U.S. government passed 37,671 rules – and monetized costs *and* benefits for only 115 of these rules.
- K. Still, since CBA is the main approach in policy analysis, and a useful input from almost any other non-cop-out viewpoint, our class focuses on CBA.
- L. CBA is not the only alternative to the cop-out answer. See any good class in political philosophy.
- IX. The Many Margins of Tax Avoidance
 - A. When you first bring up supply and demand elasticities, people tend to think of them as small. (I.e., they think of curves as close to vertical).
 - 1. Ex: "Who is going to drive less just because the price of gas rises by a penny?"
 - B. Such quick dismissals often overlook innumerable ways people can alter their behavior to avoid taxation.
 - C. Example #1: Luxury Taxes.
 - D. You might think that people who buy luxuries are rich, they won't buy less just because you impose heavy luxury taxes.
 - E. However:
 - 1. Many purchasers of luxury products aren't rich; they are often middle- or low-income people who really like certain specialty products.
 - 2. Moreover, the rich don't "have to" spend their riches on luxuries. They could just buy larger *quantities* of untaxed products.
 - 3. In addition, most luxury taxes only apply to fairly obvious "luxuries." They will typically omit things like nice houses and travel.
 - 4. Less obviously, the rich could just consume the luxury of leisure instead.
 - F. Example #2: Income Taxation

- G. You might think: "Who is going to quit their job just because the tax rate rose from 36% to 39.6%?"
- H. However:
 - 1. There are numerous groups that just might do this:
 - a) Married women
 - b) People nearing retirement
 - c) Teens
 - d) Students
 - 2. Employees could work less overtime, devote less energy to their careers, and so on.
 - 3. Employers could switch from (taxed) monetary to (untaxed) non-monetary compensation - company cars, travel, free meals, health insurance...
 - 4. In the longer run, people could change their career plans, shifting from high-income, low-fun occupations (doctor?) to low-income, high-fun occupations (professor?). The income tax does not tax "fun," after all.
- I. If Q falls enough in response to taxation, it is quite possible for a tax authority to raise **less** revenue with **higher** taxes.
- J. This insight - as applied to income taxation - can be illustrated with a so-called "Laffer curve." If the income tax rate is 0%, the government raises no revenue. But if the income tax rate is 100%, no one will work, so again the government raises no revenue. Thus, the Laffer curve looks like an upside-down U.
- K. Partly as a result of this insight, many governments around the world have cut their highest tax rates since 1980.
- X. Redistribution and the Equity-Efficiency Trade-Off
 - A. Governments don't just take money from people. They also give them money, aka "redistribution."
 - B. For most purposes, you can think of redistribution as "negative taxation." So everything we've learned about taxation still applies.
 - 1. A subsidy for non-work has the same effects as a tax on work.
 - 2. A subsidy for failure to save has the same effects as a tax on saving.
 - C. Governments can redistribute cash or "in-kind." The deadweight losses of "in-kind" redistribution are especially severe, especially when the government gives expensive products away for free.
 - 1. Diagramming gratis pricing.
 - D. Assuming that government uses taxes and redistribution to make society "more fair," this implies an "equity-efficiency trade-off."
 - 1. Usual picture: The most "equitable" outcome is perfect equality, but this gives people terrible incentives. The free-market outcome, in contrast, is the most "efficient," but this is terribly unfair.

- E. SDB makes people reluctant to acknowledge the equity-efficiency trade-off, but economists mostly just debate its *severity*.
- F. Deeper SDB: Assuming government uses taxes and redistribution to make society more fair in the first place! It's clearly possible for government to take the free-market outcome and make it *less* equal or otherwise fair.
- G. Plenty of huge real-world policies plainly increase inequality.
- H. Clear-cut cases:
 - 1. Immigration regulation
 - 2. Housing regulation
 - 3. Energy regulation
- I. Likely cases:
 - 1. Universal redistribution, because the rich live longer.
 - 2. Education subsidies, because the children of the rich consume more education.

Week 6: Quality and Information Economics

- I. Quality Competition
 - A. Question: Why don't we all consume the highest possible quality?
 - B. Answer: Higher quality must be more expensive. "You get what you pay for."
 - C. Supply and demand of quality: When quality increases...
 - 1. Demand increases (people are willing to pay more for higher quality)
 - 2. Supply decreases (it is more expensive to produce higher quality products, so suppliers are willing to sell fewer units at each price).
 - D. While this conceivably creates an incentive for suppliers to secretly cut prices, this is mostly solved with:
 - 1. Reputation
 - 2. Warranties
 - E. What happens in the long-run if sellers can *cost/ess/ly* increase quality?
- II. Regulation and Quality
 - A. Does banning low quality benefit consumers? (Note: Safety is presumably one aspect of quality). How could it? This just forces people who want low quality to either buy nothing or pay for more quality that they don't want.
 - B. Applications:
 - 1. Airbags
 - 2. FDA
 - 3. Privacy regulations
 - C. Paternalism is the best defense, yet usually pretty weak.
 - D. Recall: How do price controls affect product quality? The quality of surplus products tends to improve; the quality of products in shortage tends to decline. Ex:
 - 1. Shrinking candy bars during Nixon's price controls
 - 2. Deterioration of NYC housing stock
 - 3. Meals on regulated airlines
 - E. Is it bad that price floors raise quality? Yes, because the extra quality is worth less than the cost.
- III. Black Markets, Prohibition, and Quality
 - A. Sometimes certain varieties or qualities of products are banned or "prohibited." Ex: Narcotics, alcohol, prostitution, gambling, irreligious books. This constriction of variety reduces consumer welfare.
 - B. What are the deadweight costs of a 100% successful ban?

- C. Once prohibited, products are often still sold illegally on the "black market."
 - D. Supply and demand of prohibition: How do legal penalties on sellers affect the market? Legal penalties on buyers?
 - E. One obvious impact of prohibition is to raise the price. (Why?) A less obvious impact is to reduce product quality.
 - F. Product quality tends to decline because the usual market assurances of quality (reputation, warranties) don't work well in an illegal market.
 - G. Reputation makes you an easier target for the police, and warranties are hard to enforce in an illegal market. Therefore you get a lot of rotgut liquor, adulterated narcotics, venereal disease...
 - H. This is due to prohibition, not the products themselves.
- IV. Probability
- A. Everyone is familiar with probability to some degree, from rolling dice, playing cards, and so on.
 - B. Basic postulate of probability theory: events range from impossible (probability=0) to certain (probability=1).
 - C. Probability language allows us to **quantify uncertainty**.
 - D. Even though people rarely put a precise number on each event, they almost always have some probabilities in the back of their minds.
 - E. When people are asked difficult questions, they often say "I don't know." But what if they HAD to guess? Note: in real life, you have to guess all of the time.
 - F. Common sophism: "No one can 'know' X."
 - 1. If this means "No one can know X **with certainty**," then it's obvious but uninteresting.
 - 2. If this means "No one has any idea at all about X," then it is clearly false.
- V. Search Theory
- A. Must economists assume "perfect information"? Not at all: there is an extremely general theory of economic action under uncertainty, known as "search theory."
 - B. Basic assumptions of search theory:
 - 1. More time and effort spent "searching" increase your probability of successful discovery.
 - 2. Searching ability differs between people.
 - 3. People can make a reasonable guess about the probabilities of different events and their ability to influence those probabilities.
 - C. Main conclusion: People search so that the marginal cost of searching equals the expected marginal gain of searching.
 - D. The (endless) applications:
 - 1. Prospecting for gold.
 - 2. Searching for a job.

- 3. Dating.
 - 4. Rational amnesia.
- E. Search theory and advertising.
- F. Main conclusion: If the economics of perfect information doesn't make sense, try search theory. It explains almost everything else.
- VI. Insurance, Moral Hazard, and Adverse Selection
 - A. Insurance markets let people pool risk. You buy insurance that you expect (hope?) will give you nothing; but if something bad happens to you, the insurance pays off.
 - B. The main cost of supplying insurance is paying off claims. The "actuarially fair premium" is defined as the *probability of a payoff times the amount paid out*. Insurance firms have to charge more than the actuarially fair premium to cover their overhead (buildings, adjusters, advertising, etc.) Important implications:
 - 1. Riskier people will be charged more on the free market.
 - 2. If you definitely have a specific problem, it's no longer possible to "insure" against it.
 - C. One problem with insurance: "moral hazard." This just means that when someone pays for your accidents and problems, you may be inclined to take less effort to avoid accidents and problems.
 - D. Insurance companies largely solve the moral hazard problem with:
 - 1. Deductibles. You still have to pay for a share of the problem (ranges from a small fee to 20% of the cost)
 - 2. Limiting the range of insurance. If someone takes a dumb risk, they aren't covered. The tale of the jeweler.
 - E. Another problem with insurance: "adverse selection." The people who *want* insurance the most are people who *need* insurance the most. If insurers aren't careful, their customers will be very high risk and they'll have to charge very high rates to stay in business.
 - F. Insurance companies largely solve the adverse selection problem with:
 - 1. Risk-adjusted premia
 - 2. Waiting periods
 - G. Moral hazard and adverse selection are common rationales for insurance regulation, but popular regulations make the problem worse.
 - 1. Requiring extra insurance amplifies moral hazard
 - 2. Requiring "fair" premia amplifies adverse selection
- VII. Signaling
 - A. Some Puzzles
 - 1. Why does non-job-related schooling still raise your income? ("What does this have to do with real life?")
 - 2. Why do you (sometimes) have to wear a suit to work?
 - 3. Why do countries have tons of weapons they never intend to use?
 - B. The resolution: signaling

- C. There are different "types" of people and firms: able and unable, smart and dumb, honest and dishonest, hard-working and lazy...
 - D. It is difficult to observe "types" directly.
 - E. However: different types (may) have different costs (lower disutility) of performing the same *observable* activity.
 - 1. Smart and hard-working people find it easier to do schoolwork.
 - 2. Lazy people find it more costly to take extra effort with an application.
 - 3. Honest firms find it cheap to provide warranties.
 - F. Therefore: It may be in the interest of the type in higher demand to go to school, fill out an application with extra care, provide a warranty, etc. - *even if the effort itself does NOTHING for buyer or seller!* People only want what the effort proves you already had in the first place.
 - G. Key implication: Subsidizing signaling makes little sense. It just forces people to use more real resources to prove the same thing.
- VIII. Education as Signaling
- A. Some kinds of education provide job skills; others don't seem to (engineering vs. philosophy). But employers still pay extra for even the most useless education.
 - B. Best explanation? Signaling. Employers want people who are smart, hard-working and/or conform to "the rules."
 - C. People who are smart, hard-working and/or conform to "the rules" find it easier/cheaper to get through school. School doesn't improve them; rather, their ability to finish school shows *they were good all along!*
 - D. Similarly, people who are dumb, lazy, and/or non-conformist have trouble finishing school. They find it too painful to finish, so they don't.
 - E. In sum: the class trouble-maker who complains that school has "nothing to do with real life" is often correct. However, this does not mean that there is no economic return to attending school.
 - F. Is there a deadweight loss of school? Yes, it is large: assuming you learn no job skills and don't like learning "for its own sake," then all time and other resources spent on education are pure waste.
 - G. The real world isn't quite so extreme, but support for education subsidies rests on a "fallacy of composition."

Week 8: Monopoly and Competition

- I. Government Monopoly
 - A. Suppose the government gives one firm the sole legal right to produce a product. Assuming profit-maximization, what happens?
 - B. Simple answer: The monopolist raises price *above* marginal cost (equivalent to: produce *less* than competitive quantity)
 - C. Complicated answer: set Marginal Revenue=Marginal Cost
 - D. Result: Monopolist earns a *monopoly profit* due to the illegality of competition. A monopoly can earn long-run economic profits, with $P > AC$ as long as the monopoly privilege persists.
 - E. What's so bad about government monopoly?
 1. Deadweight costs from $P > MC$.
 2. Deadweight costs if AC probably exceeds minimum average cost. This is an issue unless the lowest-cost firm happens to get the privilege.
 - F. Diagrammatic explanation.
 - G. Most relevant U.S. example: Licensing. While the government usually hands out more than one license, a key goal is to raise prices by reducing the number of suppliers.
- II. Variety and Monopoly
 - A. But isn't every seller of a unique product a "monopolist"?
 1. Only I can write genuine Bryan Caplan books.
 2. Isn't virtually every product unique in some ways?
 3. Remember, *location* is a key property of many products. There's only one McDonald's at University Mall.
 - B. In some ways, markets for unique products look a lot like government monopoly.
 1. Firms set $MR = MC$
 - C. But as long as entry is legal, profits still attract entry, so $P = AC$ in the long-run.
 - D. Imagine regulators could standardize products. $P = MC$, but what do consumers lose?
 - E. In the real world, firms offer a combination of cheap, standardized products and more expensive niche products, so consumers can take their pick.
- III. Preconceptions About Monopoly
 - A. When most people today think about "monopoly," they think about firms gaining a dominant position in an unregulated free market
 1. Standard Oil & Rockefeller
 2. Railroads
 3. Amazon?

- B. Obvious question: How did they *get* the monopoly?
 - C. One possibility: They became the monopoly because they had lower costs (or lower costs adjusting for quality) than their competitors.
 - D. If so, what's so bad about "monopoly"?
- IV. Competition with Few Firms
- A. When we draw supply-and-demand diagrams to represent markets, "the market" sets prices, not individual sellers.
 - B. A seller who sets a price higher than the market price would be unable to sell anything.
 - C. This is a good description of some markets, but in others there are only a few firms, and each seems to set its own prices.
 - D. Many people see markets with few firms, each setting their own prices, as being "less competitive" than markets with many firms who accept whatever price the market sets.
 - E. Are markets with few firms necessarily less competitive? No.
 - F. Consider a market with only TWO sellers. The firm that sets the *lower* price gets the whole market; if their prices are equal they split the market 50/50.
 - G. Suppose you are one of the firms. What is your best response to your competitor's offered price? What is his best response to your offered price?
 - H. Conclusion: So long as the two firms are competing, this two-firm market where firms set their prices is *just as competitive* as if there were thousands of firms taking the market price.
 - I. The same holds in a market with just ONE seller, as long as *potential* competitors exist. Yes, a "monopoly" can act entirely competitively.
- V. Cost Curves and Market Structure
- A. A cost curve just shows a firm's AVERAGE COST of producing a given quantity of output.
 - B. One of the most important features of for-profit production is that there is a strong incentive to minimize costs. Why? Because, holding quality fixed, every dollar saved is another dollar of profit.
 - C. Conversely, one of the biggest problems with non-profits (government and private) is that they lack incentives to cut costs (and sometimes even have incentives to increase costs!).
 - D. The AC curve will normally decline initially, reach a minimum (called the "minimum efficient scale"), and then eventually start increasing. Why?
 - E. When AC falls as quantity rises, there are "economies of scale." If AC rises as quantity rises, there are "diseconomies of scale."
 - F. The shape of the AC curve strongly determines the number of firms in an industry: Combine the INDUSTRY demand curve with the AC curve of one firm.

- G. If this demand curve intersects the AC curve in the declining region, you are likely to have just one firm in the market, a “natural monopoly.” But once again, fear of potential competition can lead such “monopolies” to act competitively!
 - 1. The case of Amazon
 - H. If the demand curve intersects the AC curve in the rising or flat region, there is probably "room" in the market for additional firms.
 - I. How many firms can "fit" in a market? It depends on the *size of the market* compared to the size of the *minimum efficient scale*.
- VI. Collusion
- A. Can firms earn long-run monopoly profits *without* government help? There are two main ways this could happen:
 - 1. Collusion
 - 2. Predation
 - B. Instead of actually competing with each other, maybe firms conspire with each other to keep prices high and output low. This is called “collusion,” with two main variants.
 - C. Open collusion: Firms sign a contract or make a gentleman's agreement with each other to raise prices and slash production. This has been illegal in the U.S. for about a century, but can still be seen on the international level (e.g. OPEC).
 - D. Tacit collusion: Without communicating, firms watch each other's pricing and output decisions. If the other firms raise their prices, you show that you're "in" by doing the same. Big Three automakers are a common example.
 - E. In either case: Firms take advantage of repeated interaction. If you cooperate, I'll cooperate too. If you don't cooperate, I won't cooperate either: "tit-for-tat."
- VII. Problems with Collusion
- A. Problem #1: One dissident (the "hold-out") can ruin the collusion of everyone else. The more competitors there are, the harder it is to reach an understanding with *all* producers.
 - B. Problem #2: "Cheating" - due to imperfect information about competitor's pricing and output. Secret discounts, "kickbacks," and quota violation.
 - C. Problem #3: Division of the spoils. Who has to cut back their production, and by how much?
 - D. Problem #4: Quality competition. Even if you keep the agreement to set the same price, you can still win extra customers by improving your quality, service, advertising, etc. This can reduce or eliminate the monopoly profit generated by collusion.
 - E. Problem #5: New entrants. The monopoly profits attract new entrants, eager for their "fair share."
 - 1. If you let a new entrant into the cartel, you just encourage them and reduce everyone's share of the monopoly profits.

2. If you don't let them in, they will greatly expand their production to take advantage of the high price. They become the industry "dissident."
 3. If you buy them out, you encourage people to build new firms just to "blackmail" you.
- F. Due to these problems, collusion probably barely matters in the real world.
1. Even OPEC has done poorly over the long-run.

VIII. Predation

- A. Suppose that an aspiring monopolist makes the following announcement: "I'm going to price at 10 times AC. But, if anyone dares to enter my market, I will give my product away for free until my competition goes bankrupt. Once they leave, prices go back up."
- B. This is usually called predation, or predatory pricing (it's also been illegal for about a century). In international trade, it's called dumping.
- C. The key is that the predator makes pricing decisions conditional upon the behavior of competitors.
 1. Drive competitors out of business by selling below cost.
 2. Once all competition is gone, charge monopoly price way above cost.

IX. Problems with Predation

- A. Problem #1: The predator loses as much as the prey, and probably more. If the predator is the market leader, then they must sell a much larger quantity at the same per-unit loss as the competition.
- B. Problem #2: The predator has to increase production to meet demand. With increasing AC, this can get expensive.
- C. Problem #3: The prey can temporarily shut down, and/or build up inventories until the predator gives up.
- D. Problem #4: Large-scale entry. A big firm might bankrupt Mom&Pop stores, but could a big firm credibly threaten to bankrupt another big firm that decided to enter the market?
- E. Problem #5: Banks and financial markets. In a modern economy, even the largest firm is small relative to total liquid capital. If a firm is assured high profits if it only holds out, wouldn't it be a good loan or investment?
- F. Due to these problems, there is little sign that predation matters in the real world at all.
 1. The most extreme example: free K-12.

X. Antitrust Laws: Overview

- A. The U.S. has a system of "antitrust" laws supposedly designed to prevent monopolies from arising on the free market. Antitrust laws allow for both government lawsuits and private lawsuits (with triple damages!).

- B. Laws are extremely vague so there is enormous discretion for both judges (how to "interpret the law") and regulators (which cases to pursue).
 - C. Price-fixing: *per se* illegal (*Addyston Pipe & Steel*). Most other practices subject to "rule of reason" (?)
 - D. Monopoly by internal growth (*Alcoa*)
 - E. Horizontal mergers (*Brown Shoe*)
 - F. Vertical mergers (*Ford Motor* spark plug case)
 - G. Simply setting high prices almost never constitutes an antitrust violation.
 - H. Government-created collusion largely immune to prosecution (farm cartels, licensing, taxi medallions, auto import quotas, tariffs, etc.)
 - I. Since collusion and predation rarely work, antitrust laws are basically a tax on efficient, successful firms. Antitrust laws also make it more difficult to take advantage of economies of scale.
 - J. Laws are vague enough that almost any firm is arguably guilty.
 - 1. Charge high price - monopoly
 - 2. Charge low price - predation
 - 3. Charge same price as competitors – collusion
- XI. Why the Standard Story of Monopoly Is Wrong
- A. Most history textbooks tell a story like:
 - 1. Before antitrust laws and other vital regulations, the free market allowed a few big firms to take over most of the economy. They crushed small competitors, strangled production, and charged absurdly high prices.
 - 2. Then government adopted antitrust laws and other regulations, which helped restore and preserve competition.
 - 3. But in recent decades, the market's natural tendency to monopoly has reasserted itself, once again causing grave harm to consumers.
 - B. What's wrong with this standard story?
 - C. It totally ignores government monopolies. Governments routinely deliberately restrict competition with licensing and other regulations.
 - D. Market structure heavily depends on economies of scale. Industries with high minimum efficient scale relative to demand tend to have a small number of large firms; industries with low minimum efficient scale relative to demand tend to have a large number of small firms.
 - E. Consumers *greatly* benefit from allowing firms to respond to these cost differences. This was totally true in the 19th century: Firms got big by dramatically increasing production and slashing prices. And it remains true today: Look at Costco, Walmart, and Amazon.
 - F. Collusion happens without government regulation, but rarely works. Predation on the free market barely happens at all; it's sheer paranoia.

- G. Antitrust laws do almost nothing to “preserve competition.” Instead, they let the government scapegoat successful firms, while drawing attention away from the inefficient monopolies the government itself creates.

Week 9: Labor Markets and Labor Regulation

- I. Labor Demand and Marginal Productivity
 - A. Labor demand just shows the quantity of labor-hours people want to buy at a given real wage. It is just the sum of all employers' labor demand curves.
 - B. Question: What determines an employer's willingness to pay for another hour of labor?
 - C. Define a worker's **marginal productivity** as the additional quantity of a good that he produces per hour times the market value of that good.
 - 1. Ex: If a worker produces 4 extra gallons of ice cream per hour of work, and ice cream sells for \$4.00/gallon, his marginal productivity is \$16.00/hour.
 - D. If the market wage of a worker is less than his marginal productivity, he will be hired. An employer will keep buying more labor until it is no longer profitable. It follows that *the market wage must equal a worker's marginal productivity*.
 - 1. If workers' marginal productivity is \$16.00/hour, the last employee hired will produce exactly \$16 worth of additional output, and receive his marginal productivity.
 - E. Amazing conclusion: Labor Demand is entirely determined by workers' **marginal productivity**. The more a worker can produce, and the greater the value of the product he produces, the more employers are willing to pay to employ him.
- II. Labor Supply, Choice of Occupation, and the Labor/Leisure Trade-off
 - A. People have to make two kinds of decisions about their time:
 - 1. Their occupation.
 - 2. How many hours to work, that is, how much of their labor to sell on the market. The rest economists call "leisure."
 - B. (While employers rarely let people "pick their own hours," people can choose their occupations and employers to try to match their desired labor/leisure mix).
 - C. For any one individual, it is unclear whether labor supply curves have much, if any, elasticity.
 - D. But people definitely choose occupations based partly on wages, which means that the labor supply curve for any one occupation will be fairly elastic.
 - E. As usual, the labor supply curve shows the total number of hours that will be sold at a given wage.
- III. Equilibrium in the Labor Market

- A. Many people balk at the application of S and D analysis to labor, but their objections are mostly SDB. As usual, just look at the intersection of S and D to figure out the wage (the "price of labor") and the employment level (the "quantity of labor").
 - B. If the wage is below the intersection of S and D, employers want to hire more workers than are willing to work. They accordingly bid up the wage.
 - C. If the wage is above the intersection of S and D, more workers are willing to work than employers want. People often call this "unemployment." Workers bid down the real wage.
 - D. At the intersection of S and D, the quantity of labor hours employers desire to buy and the quantity of labor hours employees desire to sell are equal.
- IV. Shifts in Labor Demand and Labor Supply
- A. What shifts labor D? The two components of marginal productivity: physical productiveness and the value of the product produced.
 - B. Thus, if workers get stronger, making them able to produce more stuff, and the price of the product sold stays the same, labor demand shifts up. This increases both wages and employment.
 - C. Similarly, if the value of the workers' product rises, labor demand shifts up, increasing both wages and employment.
 - D. This is a powerful analytical lens. For example, suppose that workers randomly vandalize company property. What happens to wages?
 - E. What shifts labor S? This is more complicated.
 - 1. Difficulty of acquiring the ability to do the job.
 - 2. Unpleasantness of the task. (Special term: When workers get paid extra for doing unpleasant work, this is called a "compensating differential").
 - 3. Other occupational options.
 - F. Important point: Recall that all markets are interconnected. This means that wages can rise even in occupations where productivity is stagnant.
 - 1. The barber example
- V. Involuntary Unemployment as a Product of Regulation
- A. At the equilibrium wage, there are neither labor shortages nor surpluses; unemployment is voluntary (not in the sense that it is cause for celebration, but in the sense that people do not want to work more **at the market wage**).
 - 1. Analogy: Voluntary datelessness.
 - B. Note: "Full employment" has NOT been "assumed." The *assumption* is that the wage is flexible; the conclusion of full employment follows.
 - C. How could involuntary unemployment be possible in this model? *Only if regulation keeps the real wage too high!*
 - D. There are three regions on the graph.

1. At wages above the equilibrium, there is a surplus of labor and wages are "too high."
 2. At wages below the equilibrium, there is a shortage of labor and wages are "too low."
 3. At the equilibrium wage, the labor market clears.
- E. Note: *There is no region where workers are underpaid AND underemployed!*

VI. How Labor Market Regulation Works

- A. Suppose for example that the equilibrium wage is \$10/hr. If the government imposes a minimum wage of \$15/hr., there will be unemployment. Employers will want to hire fewer people than want to be hired at the market wage.
 1. Why not \$1M per hour?
- B. Similarly, if the government mandates new benefits (job security, safety, health, family leave, etc.) and forbids real wages to fall, involuntary unemployment will be the result.
 1. Demand falls, supply rises, so the old equilibrium wage is now above the new intersection of supply and demand.
 2. The Bryan Caplan Protection Act
- C. What happens if the government mandates benefits but allows the real wage to change? Then instead of causing unemployment, wages fall by more than the value of the benefits!
- D. Interesting case: In the U.S. during the Great Depression, real wages for the employed actually rose!
- E. In Europe, labor market regulations are typically very strict. Countries' enormous and persistent unemployment rates of 8, 10, or even 15%, compared to 4% for the U.S., are an important warning of the dangers of labor market regulation.
- F. In the U.S., the minimum wage plays a small role – about .5% of the workforce earns the federal minimum wage. Many states have higher minimum wages, so 1-2% of all workers are paid the minimum wage in their states.
- G. The U.S. labor regulations that matter most are mandatory health insurance... and discrimination law.

VII. Competitive Labor Markets and Discrimination

- A. Economists have analyzed the economics of discrimination and anti-discrimination law in detail. There is a large gap between the analytically-informed interpretation and the emotional story people like to believe.
- B. Let's focus on discrimination by **employers**. If it means anything, it means that they are willing to pay higher wages to members of liked groups and lower wages to members of disliked groups *assuming their marginal productivity is the same*.
- C. The last point is crucial. You can't compare average wages of different groups, and assume the lower-paid group is the victim of

discrimination. You have to control for differences in training and ability.

- D. Now suppose that employers dislike the Irish even though they are just as productive as non-Irish. Irish wages are accordingly lower. But can this situation endure?
 - E. Under these conditions, the less prejudiced an employer is, the higher his profits. Greed provides a strong incentive to judge people based on their marginal productivity.
 - F. In the long-run, the least prejudiced employers come to dominate the market because they are consistently more profitable.
 - 1. The case of illegal immigrant workers
 - G. If this is right, then what do anti-discrimination laws do? If they identify discrimination correctly, almost nothing, because it so rarely happens.
 - H. But if they identify discrimination incorrectly, the laws reduce "protected" groups' expected marginal productivity! It's a standard incidence problem. If I know you could sue me if I hire you, my demand for your services falls.
 - I. Discrimination suits at the hiring stage are very rare. Almost all cases are brought against firms that *did* hire members of protected groups, then were disappointed with the worker's performance.
 - J. If discrimination laws make group-varying wages legally dangerous, then anti-discrimination laws function like price controls. Lucky workers get above-market wages, and the rest have trouble finding a job at all.
- VIII. Unions and Occupational Licensing
- A. Unions are basically labor cartels. The goal is to push up wages by restricting labor supply.
 - 1. The hope is that non-members bear all of the unemployment, though in practice union members also suffer.
 - B. In free markets, unions exist, but are very rare. In practice, they heavily depend on government support.
 - C. Even with government support, private sector unions barely matter in the modern U.S. economy. Their share of the workforce has been falling for many decades, and is now about 5%.
 - 1. Public sector unionization, in contrast, has held steady for decades at about 33% (also about 5% of the workforce).
 - D. Occupational licensing works like unionization: raise wages for insiders, disemploy outsiders. But in the modern economy, almost 30% of American workers need a license to legally do their jobs.
 - E. Licensing clearly raises the wages of licensed workers; they make about 15% more than you'd otherwise expect. (Roughly as big a bonus as unionized workers get).
 - F. People often claim that occupational licensing raises quality and protects the public, but:

1. For many licensed occupations – barber, interior decorator, athletic trainer – this argument fails the laugh test.
 2. The average study of the effect of licensing on quality finds a moderately *negative* effect on quality. (Not so surprising: Licensing inhibits innovation).
 3. Higher quality is often not worth the extra price. Markets (or government *certification*!) let consumers decide for themselves. Licensing makes everyone pay full price.
- G. Unregulated markets have simple mechanisms to ensure quality:
1. Reputation
 2. Guarantees
 3. Lawsuits (much less important, but a useful last resort)
- H. We already heavily rely on these mechanisms – see eBay and Amazon Marketplace. Why can't we rely on them in labor markets?
- IX. Why the Standard Story of Labor is Wrong
- A. Most history books tell a story something like this:
1. In the days before the minimum wage, unions, etc., life was terrible for workers because employers paid them whatever they felt like paying them.
 2. But then government became more progressive, and changed the laws.
 3. Life is now better for workers because employers' greed has been tamed.
- B. This makes little sense.
- C. Employers compete with other employers; they care about their own profits, not the profits of employers in general.
- D. Why then were workers paid less in the past? Their marginal productivity was lower! As technology progressed, the marginal productivity of workers increased, and labor demand accordingly went up.
- E. Suppose government had imposed strict regulations when productivity was low? The result would have been higher wages for the lucky, but permanent unemployment (and probably starvation) for the rest.
- F. The problem of workers in the Third World isn't lack of regulation, but low productivity. Of course, low productivity can be a product of a crummy political system, but you can't solve that problem with labor market regulation.

Week 10: Externalities, I: Market Failure

- I. Return to the Tragedy of the Commons: Negative Externalities
 - A. Previously, we discussed the "tragedy of the commons." Basic idea: when no one owns a resource, it gets over-used.
 - B. Question: But what exactly does "over-use" mean in economic terms?
 - C. Answer: It means that there are costly side effects that selfish agents don't factor into their decisions. Economists call these costly side effects "negative externalities."
 - D. How do you diagram negative externalities? In addition to the demand curve, draw a "social benefits curve." With negative externalities, the social benefits curve will lie below the demand curve.
 - E. Applying standard Cost-Benefit Analysis, the social optimum is at the intersection of the social benefits curve and the supply curve, but market equilibrium is at the intersection of the demand curve and the supply curve.
 - F. Economists call this a **market failure**, since self-interested behavior leads to inefficient results.
 - G. Negative externalities are also often called "public bads," especially when the externalities are large relative to demand (so the socially optimal quantity is close to zero).
 - H. Ex: Pollution. People value better air, but polluters normally have no incentive to care.
 - I. The key: non-excludability.
 1. There is no feasible way to exclude non-payers from the cleaner air.
 2. Since you do not *have to* pay to use it, selfish people *will not* pay to use it.
 3. And if no one will pay for it, why would selfish producers provide it?
- II. Positive Externalities
 - A. Positive externalities are the other side of the coin. Positive externalities are **beneficial** side effects that selfish agents don't factor into their decisions.
 - B. How to diagram? Draw a social benefits curve *above* the demand curve.
 - C. Again applying CBA, the social optimum is at the intersection of the social benefits curve and the supply curve, but market equilibrium is at the intersection of the demand curve and the supply curve.

- D. Positive externalities are also often called "public goods," especially when the externalities are large relative to demand (so the equilibrium quantity is close to zero).
 - E. Non-excludability is once again the key attribute. If you can't exclude, there is no incentive to pay; if there is no incentive to pay, there is no incentive to produce.
 - F. Ex: Defense. People value defense, but how can suppliers be paid to provide it?
- III. Correcting for Negative Externalities
- A. A common initial reaction people have to negative externalities is: "Ban it!"
 - B. Obvious objection: The cure is worse than the disease. Many valuable activities (like driving) – and even many activities essential to life (like breathing!) - have negative externalities.
 - C. If they grasp this point, many people's next impulse is to set quantitative limits – like emissions inspections, or technological mandates - like new emissions standards for cars.
 - 1. Particularly crazy variants: "Best Available Technology" and ALARA for nuclear power.
 - 2. Perverse effects of technological mandates: Since they raise the price of new cars, they encourage people to keep driving old cars that pollute a lot more.
 - D. *These approaches are highly inefficient.* Quantitative limits and technological mandates ignore heterogeneity: Some firms can reduce pollution more cheaply than others; some people may value polluting more than others; some technologies may cost more than they are worth.
 - 1. Application: Carpool lanes.
 - E. *More efficient regulatory solutions that take heterogeneity into account exist:*
 - 1. Taxes
 - 2. Tradable permits
 - F. Advantage: This gets you the same pollution level at a lower price. Firms that can easily switch to less polluting technologies sell their permits to firms where reducing pollution is expensive.
 - G. Complication: Getting the margin right. A tax on cars reduces the number of cars produced, but does nothing to discourage people who own cars from polluting.
- IV. Correcting for Positive Externalities
- A. A common initial reaction people have to positive externalities is: "This is a job for government, not the market."
 - B. Obvious objection: Overkill. There is no need for government to take over the whole industry just because of some positive externalities.
 - C. A much less intrusive option is for government to subsidize activities with positive externalities.

- D. Getting the margin right: Suppose there are positive externalities of voter education, but not math. If you subsidize ALL education, adjusting for the externalities of voter education leads to an inefficiently high level of mathematical education.
- V. The Logic of Pigovian Taxes and Subsidies
 - A. According to CBA, how high should these taxes and subsidies be?
 - B. The economist Pigou explained the logic:
 - 1. Tax goods with negative externalities until the SB and S curves intersect. (This is called a Pigovian tax).
 - 2. Subsidize goods with positive externalities until the SB and S curves intersect. (This is called a Pigovian subsidy).
 - C. Key ideas:
 - 1. The bigger the externality, the bigger the optimal tax or subsidy.
 - 2. As long as you're willing to pay the new market price, you can produce and consume as much as you like.
 - 3. Other than collecting the taxes and sending the subsidies, there is no additional role for government!
 - D. Friedman's caveats:
 - 1. Must distinguish benefits from external benefits. (E.g. education).
 - 2. Must include both positive and negative externalities in your calculations. (Important case: "pecuniary externalities").
 - E. Bigger picture: "Positive externalities" are not the same as "Anything politically popular" and "negative externalities" are not the same as "Anything politically unpopular." Similarly, "corrections" are not the same as "However government responds."

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Week 11: Externalities, II: Government Failure

- VI. The Reality of Government Policy
 - A. Real-world governments barely use Pigovian taxes or subsidies.
 - B. Counterexamples?
 - 1. Sin taxes
 - 2. Gas taxes
 - 3. Cost-sharing for artificial lawns, solar panels, etc.
 - 4. Toll roads
 - C. If they see social problems, governments usually respond with a massive body of detailed regulations or outright prohibition.
 - 1. Carbon taxes versus carbon policy
 - 2. Drug policy
 - 3. Worker safety
 - 4. HOV
 - D. If they see unrealized social gains, governments usually respond with direct ownership and giveaways.
 - 1. K-12
 - 2. National health care
 - 3. National highway system
 - E. The world's most Pigovian country: Singapore.
 - F. What's the harm? Massive efficiency losses. Pigovian taxes deliver much better results than the status quo.
 - 1. Indeed, the status quo could easily be worse than doing nothing, even when there are large externalities.
 - G. When they do charge, governments rarely try to set market-clearing prices.
 - 1. Traffic
 - 2. Parking
 - H. Worse yet: Governments make little effort to measure externalities, or even get the sign right.
 - 1. Education and credential inflation
 - 2. Delaying vaccines
 - I. Critics of markets often use Pigovian logic to condemn markets in theory. But Pigovian logic also condemns government in practice, because zero governments are even close to Pigovian.
- VII. What Goes Wrong: The Logic of Decisiveness
 - A. People usually blame bad policies on lack of democracy. But Pigovian taxes and subsidies are almost non-existent even in democracies.
 - B. Why is this so? Almost certainly because the status quo is much more popular than the Pigovian alternative.

- C. This is not a local or short-lived problem. No earthly government in recorded history has been close to Pigovian.
 - D. Economics and common-sense tell us that for all their faults, people aren't complete fools. Can they really be complete fools in politics?
 - E. I say yes, because of a key asymmetry between markets and politics.
 - 1. In markets, if you figure out a better approach, you can adopt it and improve your life.
 - 2. In politics, if you figure out a better approach, you can't adopt it unless you convince a majority of voters first.
 - 3. Have you ever convinced a majority of voters of anything? I haven't.
 - F. But doesn't "every vote count"? Only microscopically. The chance that your vote flips an electoral outcome, also known as the "probability of decisiveness," is roughly 0.
 - 1. Mathematically: $p \approx 0$
 - G. The chance that your decision changes the contents of your shopping cart, in contrast, $p \approx 1$.
 - H. Selfishly speaking, what happens if you vote randomly – or emotionally?
 - 1. The same thing that would have happened otherwise!
 - I. Since voters' probability of decisiveness is roughly 0, people make little effort to think rationally about politics.
 - J. Instead, they respond emotionally. In markets, self-interest gives you strong reasons to control your emotions; in politics, the opposite is true.
 - K. Lesson: Politics isn't a grocery market; it's a common pool. We all throw our intellectual garbage into the pool, even though it's our sole source of drinking water.
- VIII. SDB and Politics
- A. Reminder: SDB= "Social Desirability Bias"; CBA= "Cost-Benefit Analysis."
 - B. What happens if the whole electorate votes emotionally? SDB crushes CBA!
 - C. Look at political arguments. CBA plays almost no role. All sides just try to say what sounds good – and goad their opponents into saying what sounds bad.
 - D. What economic ideas sound good to typical voters? To start:
 - 1. Blaming markets
 - 2. Blaming foreigners
 - E. More generally: On any policy issue, both sides try to sound good, with almost no measurement or math – practically the definition of "demagoguery." Examples:
 - 1. Tariffs
 - 2. Education
 - 3. FDA

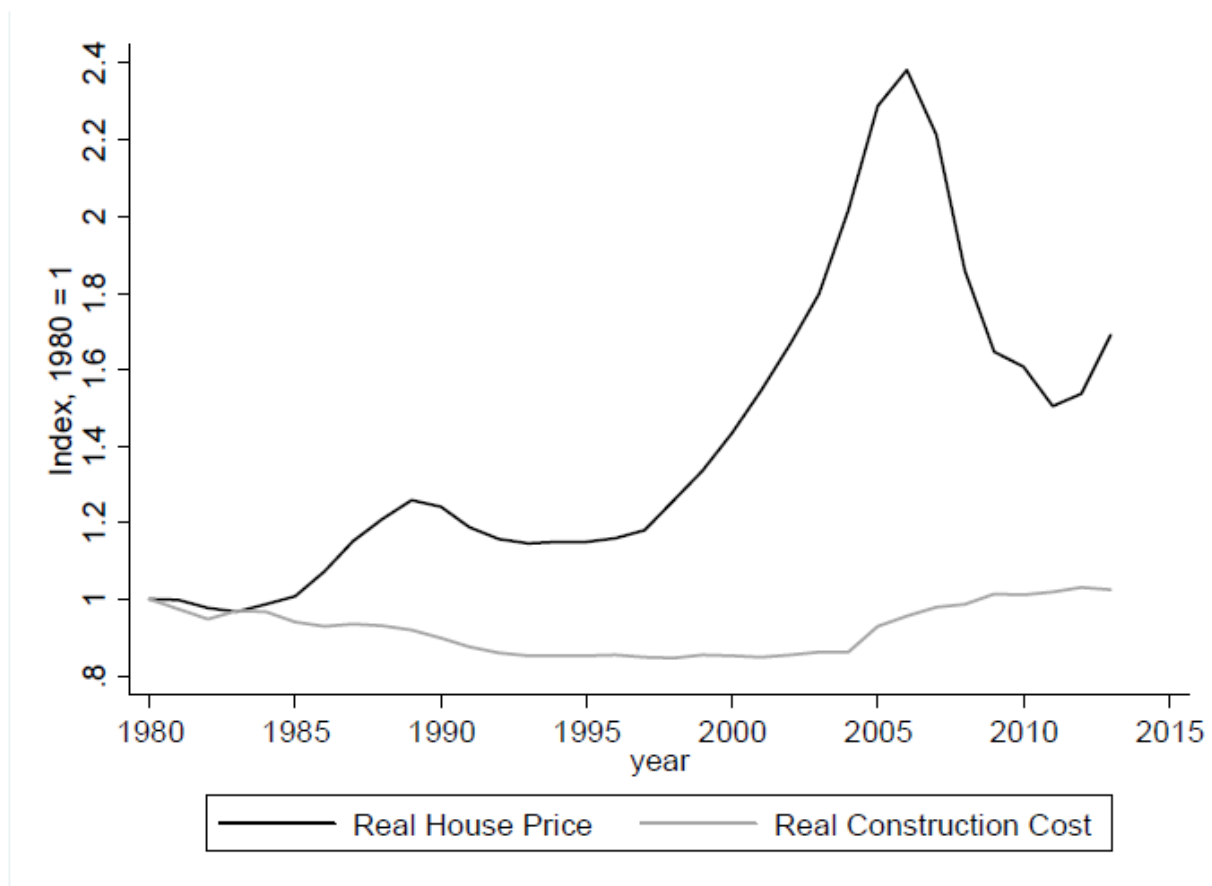
4. Carbon emissions
5. Immigration
- F. When policies don't match CBA, apologists often say, "People just care more about equity." But migration patterns show this apology is largely SDB, too!
 1. How so? Because material well-being is a *much* better predictor of migration than any measure of "equity."
 2. Lots of California Democrats moved to Texas.
 3. The Gulf monarchies have no trouble attracting migrants.
- G. Unlike rhetoric, actual policies have to use at least a *little* measurement and math. Resources are finite and there are multiple problems, so no government actually "Does everything possible" for any one problem.
- H. Still, SDB is a *vastly* stronger predictor of actual policy than CBA.
- IX. Action Bias and Politics
 - A. When was the last time you heard a politician say, "We should do nothing about this problem"?
 - B. "We should do something" may sound like common sense, but it's not. What should you do about mosquito bites, for example? Leave them alone.
 - C. In psychology, the technical name for our urge to "do something" is "Action Bias." While you can easily think of it as a special case of SDB, it's so pervasive in politics that it's worth a separate discussion.
 - D. When does CBA recommend "doing nothing" about a problem?
 1. When you are extremely ignorant about how to help.
 2. When you know that helping is very costly.
 - E. In politics, however, it is extremely unusual to argue:
 1. "We don't know how to help, so let's do nothing until we learn more."
 2. "We could solve this problem, but the cost is too high."
 - F. Even if we're doing something, Action Bias pushes us to do *more* when any new problem emerges. CBA says this is a silly presumption.
 1. Ex: If you get into one car accident in ten years, does this show you should change your driving habits? Maybe one accident per decade is optimal.
 - G. Action Bias also pushes us to design bespoke "solutions" for every notable problem. E.g., instead of just giving the poor money for necessities, have separate programs for food, housing, and energy assistance.
- X. Availability Cascades
 - A. Closely related: Kuran-Sunstein's "availability cascades" model of mass hysterias and political crusades.
 - B. Cognitive psychologists have found that people frequently estimate probabilities based upon *how easy it is to think of examples*.

- Psychologists call this the “availability heuristic.”
- C. This often leads to systematically biased estimates. Psychologists call this “availability bias.”
 - D. This bias is normally demonstrated in simple experiments. How does it play out in the real world?
 - E. The cycle of hysteria:
 1. The media gives massive coverage to shocking but rare events in order to get good ratings.
 2. The public watches. Watching makes it easier for the public to think of examples of the events the media covers.
 3. One effect: The public begins to think the problems are quantitatively serious, so it gets easier to sell the public similar stories.
 4. Other effect: Politicians begin trying to solve the “problem” to win votes.
 - F. Examples:
 1. Nuclear power
 2. Genetically-altered food
 3. School shootings
- XI. The Ubiquity of Government Failure
- A. The Pigovian framework highlights endless ways for markets to fail CBA, then provides a recipe for governments to design remedies that pass CBA.
 - B. This often leads economists and other social scientists to defend almost all of government’s current activities, plus many more.
 - C. To repeat, however: No government on Earth is remotely Pigovian!
 - D. Governments don’t use CBA to decide whether markets fail. Instead, they use SDB: Does market performance *sound* good?
 - E. Governments don’t use CBA to decide how to “fix” markets, either. Instead, they use SDB: Does this remedy *sound* good?
 - F. The problem: CBA shows that lots of good stuff sounds bad, and lots of bad stuff sounds good. So real-world government actions routinely fail CBA.
 - G. Or so I claim. In our last two classes, I’ll defend two radical policy reforms where SDB currently crushes CBA.

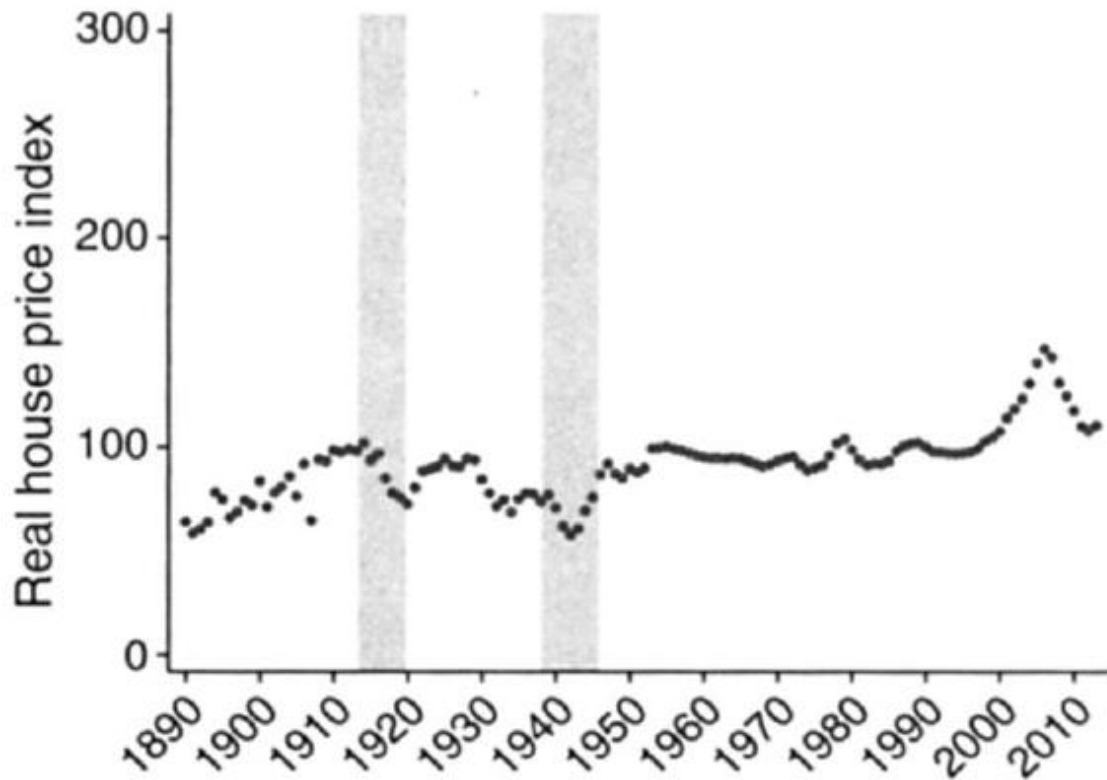
Week 12: A Modest Proposal: By-Right Construction

- I. Housing Regulation: The Basic Facts
 - A. Over the last 50 years, US housing prices have increased much more than inflation, especially in the most desirable areas of the country.
 - B. Historically, even large increases in demand had little long-run effect on housing prices. Instead, builders just made more housing until prices fell back to the “breakeven” level.

Figure 1: Real Construction Costs and House Prices Over Time

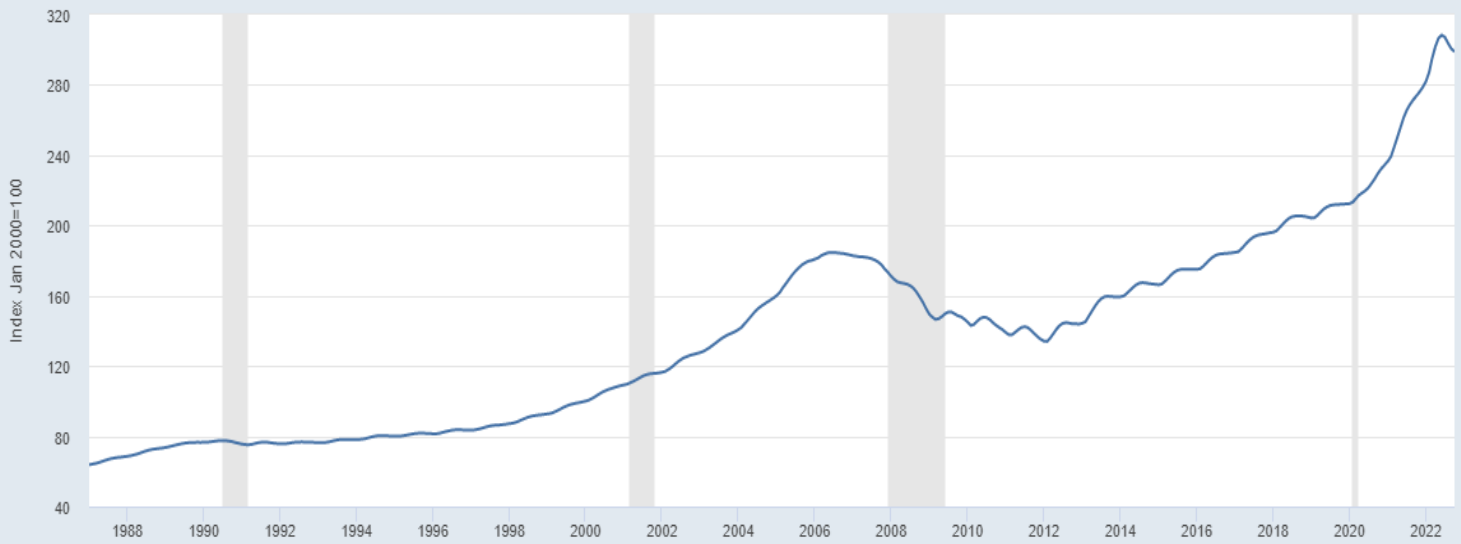


Panel N. United States, 1890–2012



- C. Despite regional differences, the national trend toward higher housing prices actually accelerated during Covid.

FRED — S&P/Case-Shiller U.S. National Home Price Index



Shaded areas indicate U.S. recessions.

Source: S&P Dow Jones Indices LLC

fred.stlouisfed.org

- D. This is a big deal because Americans spend about 20% of their income on housing.
- E. What happened? The go-to answer, as usual, is just “supply-and-demand.”
 - 1. Population keeps going up, so shouldn’t demand constantly rise?
- F. The puzzle: S&D used to bring housing prices back down to cost in the long-run. Why doesn’t this happen anymore?
- II. The Effect of Regulation on Housing Prices
 - A. Almost all economists who study this issue converge on the same story: regulation. Getting permission to build homes is very hard, which keeps housing prices permanently well above cost.
 - B. The main regulations:
 - 1. Building height limits
 - 2. Multi-family restrictions
 - 3. Minimum lot size
 - 4. Parking requirements
 - 5. Government land ownership, especially federal
 - 6. Environmental regs
 - 7. Conflicting uses zoning
 - 8. Historic preservation
 - 9. Pure delay
 - C. Hard to say exactly which regulations matter most, but much easier to measure the *total* effect of all regulations. Standard approach:
 - 1. Look at value of similar homes with slightly different amounts of land.
 - 2. Use this to estimate the pure value of land.
 - 3. Then combine with standard estimates of construction costs to see how much homes physically cost to make.
 - 4. Then, we look at the difference between this estimate and actual market prices.
 - D. Earlier work found enormous “zoning taxes” in the most desirable areas, but not much elsewhere.
 - E. Later work with better data on vacant lot prices also finds large zoning taxes in almost all major cities.
 - 1. If many people actually live somewhere, the zoning tax there is probably very high.
 - F. Key point: People spend vastly more on housing than on, say, gasoline. So doubling this cost has *large* negative effects on living standards.
 - 1. Rough estimate: Without regulation, the cost of living would be 10% lower, implying living standards 11% higher.
 - G. Additional effect: High prices discourage people from migrating to high-productivity areas, further depressing living standards.
- III. The Pigovian Defense

- A. You could accept that housing regulation drastically increases housing prices, but defend this outcome using CBA.
- B. How? Argue that each of the notable regulations is a wise response to negative externalities.
- C. Building height limits? They keep builders from blocking the light of existing owners, and protect aesthetics.
- D. Multi-family restrictions? They reduce parking and traffic problems, and prevent congestion of public services.
- E. Minimum lot size? They, too, reduce parking and traffic problems, and prevent congestion of public services. Plus aesthetics.
- F. Parking requirements? They reduce parking problems.
- G. Government land ownership? They protect the aesthetics of the entire country.
- H. Environmental regs. They protect the air, water, climate, wildlife, and more.
- I. Conflicting use zoning. To prevent industrial use from bothering commercial and residential establishments, and to prevent commercial establishments from bothering residential.
- J. Historic preservation: "We all benefit from preserving our history."
- K. Pure delay. It takes careful study and deliberation to detect and measure negative externalities.
- L. Big Problem #1: Pigovian corrections allow people to create all the negative externalities they want as long as they pay the price. Few actual regulations, in contrast, allow you to just buy your way out.
- M. Big Problem #2: Many of the so-called "negative externalities" could easily be solved with normal market pricing!
 - 1. Modern tech allows market-clearing driving and parking fees, but almost no government uses these techs.
 - 2. Conflicting uses naturally separate. Industry wants to locate near ports and rail to get low transportation costs; commercial wants to locate near main roads to get drive-by customers; luxury homes are worth more next to other luxury homes.
- N. Big Problem #3: Pigovian corrections match the severity of the negative externalities. Actual regulations don't.
 - 1. How severe can the negative aesthetic externalities of adding a skyscraper really be?
 - 2. How many beloved historic buildings would builders *want* to demolish?
- O. Big Problem #4, the biggest problem of all: These defenses only consider the negative externalities of construction, but there are also enormous *positive* externalities!
 - 1. How do we know? Actions speak louder than words: You can escape almost all negative externalities by living in a remote rural location, but almost no one chooses to do so.

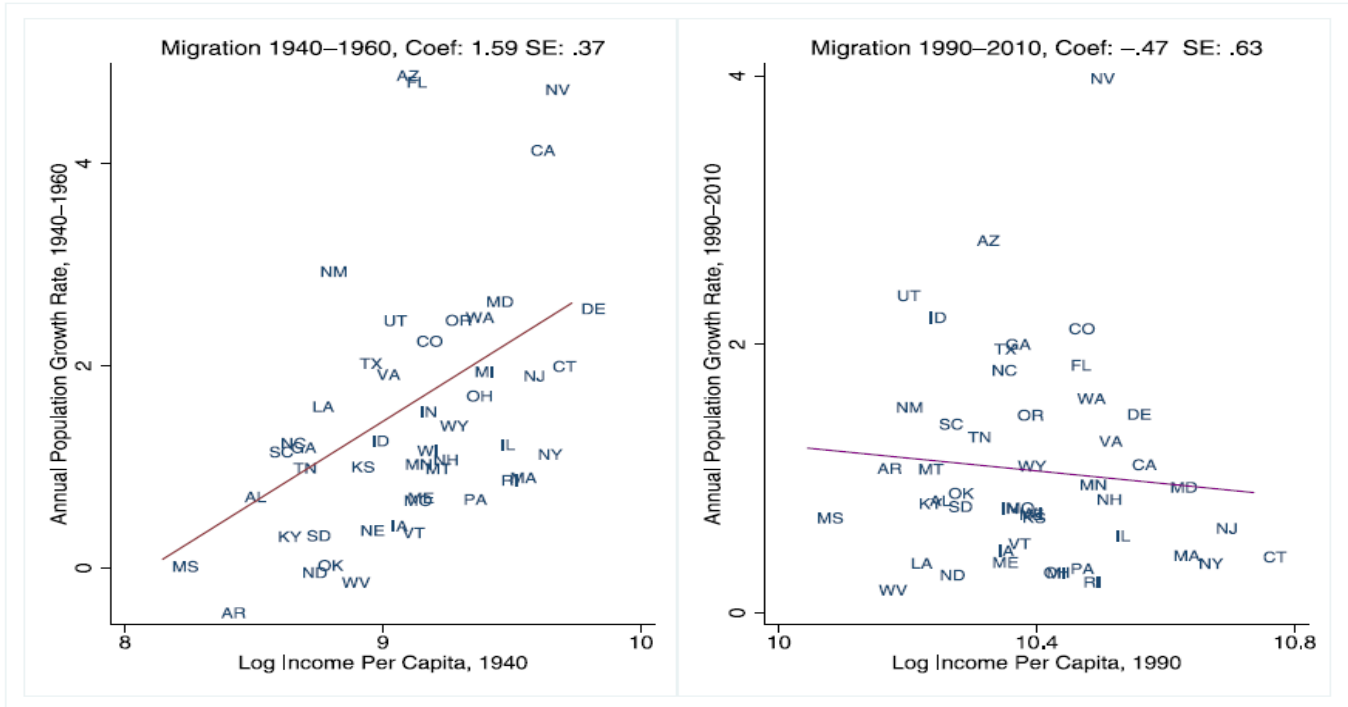
2. Prices show that the NET value of all the benefits of density minus all of the costs of density is strongly positive.
 3. What are the positive externalities? Work, consumption, and social opportunities.
- P. If it's unclear that housing has net negative externalities, standard CBA of markets makes sense. U.S. housing regulation really does waste roughly 10% of GDP per year, plus additional massive GDP losses from discouraging migration to high-productivity regions.
- IV. By-Right Construction: The Panacea Policy
- A. My modest proposal: "by-right construction." Get rid of *all* this regulation, so property owners once again decide what to do with their own property. If you don't like it, the burden is on you to prove that they're violating *your* property rights.
 - B. Main benefit: Housing abundance.
 - C. But there are also many extra benefits, because housing regulation amplifies many social ills.
 - D. Inequality and poverty: The poor spend more on housing, and homeowners are richer than renters.
 1. Poorest quintile expenditure share: 24.5%; richest quintile 17.7%.
 2. Median 2015 family income for renters: \$34k; for owners, \$52k.
 - E. So deregulation clearly reduces inequality, and is especially helpful for the poor.
 1. How should CBA count this?
 - F. Rognlie's diagram on capital's rising share and housing regulation:

IS CAPITAL INCOME DISPLACING LABOR INCOME? ONLY IF YOU COUNT HOUSING

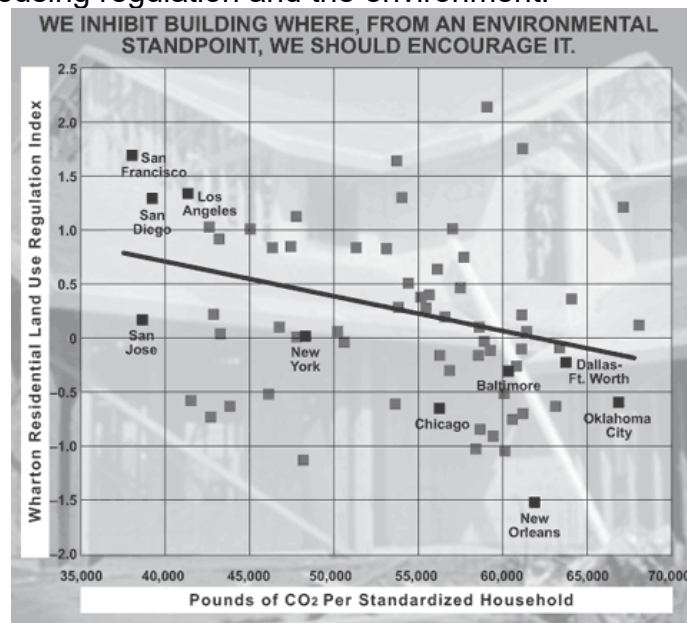
Net Capital Income as Shares of Total Private Domestic Net Value Added in the U.S., Canada, Germany, France, UK, Italy, and Japan 1948-2010*



- G. Mobility: When housing prices were close to cost, moving from a poor state to a rich state was a reliable way to raise your income. And many Americans took advantage of this opportunity.
- H. Due to regulation, the extra housing cost in high-income states often exceeds the wage gain. Now Americans tend to move *away* from high income areas to get cheaper housing.



- I. Housing regulation and crime: A notable experiment shows that vacant lots cause crime. So allowing construction should cut crime.
- J. Housing regulation and the environment:



1. Central cities are 5-10% greener than surrounding areas.
 2. California is greenest; the South is least green; the Northeast is in-between.
 3. New homes, though bigger, are greener.
 4. Areas with the most housing regulation are (coincidentally!) greener.
 5. Upshot: Housing deregulation would move development into greener locations (and greener buildings).
- K. Regulation and low birthrates: Multiple papers find cheaper housing raises fertility.
- L. “Deaths of despair” and non-college males.
1. “Revive construction, not the Rust Belt.”
- V. Parking, Traffic, Schools, and Pricing
- A. Remember the problems with gratis pricing?
 - B. Congestion often amplifies the waste, because crowding degrades the quality of the product.
 - C. Standard complaints about new housing:
 1. Parking
 2. Traffic
 3. Schools
 - D. All of these problems arise because governments refuse to charge market-clearing prices (or often, any price at all).
 - E. Obvious remedy: Deregulate housing and raise prices on congested goods.
 - F. If local redistribution is an excuse to exclude the poor from your locality, why have local redistribution in the first place?!
- VI. CBA Versus Voter Self-Interest
- A. Most critics of housing regulation – including economists – blame crafty NIMBYs. (“Not In My BackYard.”)
 - B. The story: Even though regs fail CBA, they are in NIMBYs’ self-interest. “I’m just protecting my property value here.”
 - C. But this story is grossly overrated.
 1. If true, people would happily allow development if existing owners got a property tax discount, and new owners paid a property tax premium.
 2. “Let’s make a deal!”
 3. What about owners who want to upgrade? Who want their adult kids to live nearby?
 4. Renters favor regulation, too.
 5. In polls, just mentioning developers’ profits sharply reduces public support.
 - D. Alternate stories:
 1. Economic illiteracy
 2. Status quo bias/myopia (“The history of the future.”)
 3. Innumeracy
 4. Paranoia

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Week 13: A Modest Proposal: Open Borders

- II. What's the Optimal Number of People?
 - F. People often worry about "overpopulation" or "underpopulation." What does this mean in economic terms?
 - G. It's tempting to say "optimal population"="population with maximum GDP per capita." But:
 - 1. Anyone who has a baby rejects this at the household level. When my wife and I had twins, our family's per-capita income fell by 50% as a matter of pure arithmetic.
 - 2. By this standard, the existence of life-loving but below-average people is "suboptimal."
 - H. Even by the "maximize per capita GDP" standard, though, the world still might be underpopulated. Consider: Over the last two centuries, both population and per capita GDP have massively increased.
 - I. Furthermore, over the last 150 years, the real prices of food, fuel, and minerals have fallen by about 1%/year. The main commodity that keeps getting more expensive: labor. If we're "running out" of anything, it's people.
 - J. In any case, economists' real standard for over- or underpopulation is whether *the marginal baby born has (on net) negative or positive externalities*.
 - K. Slogan: "You don't have to raise the average to pull your weight."
- III. Negative Externalities of Population
 - F. As Landsburg notes, many people think that each child born gets a 1/7 billion share of world resources - implying negative externalities.
 - G. This isn't how the world really works. Instead, when a family has one more child, each child in that family gets a *lot* less, with little effect on anyone else.
 - H. This is especially clear from bequests. Picture a simple agricultural economy where kids always divide their parents' landholdings equally. If everyone but you has lots of kids, your kid inherits just as much land – and his land will actually be worth more due to higher demand.
 - I. Lesson: With private property, parents who care about their kids automatically internalize any "poverty externality." Under old-school socialism, in contrast, the poverty externality is very real. You can have as many kids as you like without reducing your family's consumption at all.

- J. Poverty aside, people also often worry about the negative *environmental* externalities of population.
- K. Key economic point: Limiting population to reduce environmental externalities is using a sword to kill a mosquito. Why not just raise the price of environmental damage with e.g. pollution taxes?
- L. The same applies to congestion externalities. If the roads are crowded at rush hour, rush hour tolls are a much cheaper and more humane solution than preventing people from existing.
- IV. Positive Externalities of Population
 - F. Does population have any *positive* externalities? Yes!
 - G. Existence externality: Most people are happy to be alive, but parents can't charge you for the privilege of existing.
 - 1. In Singapore, though, you are financially responsible for your elderly parents.
 - H. Idea externality: Progress depends largely on ideas, and ideas come from people.
 - 1. Historically, almost all progress comes from populous, connected regions of the world – especially Eurasia.
 - 2. Historically, isolated areas with low populations have low, zero, or negative progress. See Tasmania.
 - I. Notice: Technology has now connected the whole world. A great idea anywhere quickly becomes a great idea everywhere.
 - J. Population increases both the supply and demand for new ideas. This is most obvious for languages, but works in all areas of idea creation.
 - 1. Imagine deleting half the names in your music collection, or half the Nobel prize-winners.
 - K. Choice externality: More population means more choices. See NYC vs. Hays, Kansas. The fact that urban rents are higher than rural rents shows that people prefer (people + the indirect effects of people) to splendid isolation.
 - 1. Pointed question: Why don't people who complain about overpopulation move to the middle of nowhere?
 - L. Retirement externality: Government old-age programs are pyramid schemes. With lots of kids, low taxes can sustain high benefits. Low birth rates are a major reason why Social Security and Medicare are going to be in big trouble.
 - 1. What if government benefits for the elderly depended on your number of kids?
 - M. Even without government programs, the elderly benefit if other people have kids. Imagine: What would happen in seventy years if everyone stopped having kids today?
- V. Immigration as Trade, I: Potential Gains
 - F. With identical workers, immigration raises the workforce without raising worker productivity, so labor supply rises, labor demand stays the same, and native workers are worse-off.

1. Does this mean that immigration is bad for humanity, or for natives generally? Absolutely not: basic CBA of markets still holds!
 2. The secret of mass consumption is mass production.
- G. In the real world, native workers and immigrant workers are *far* from identical.
1. Most obvious difference: Current immigrants tend to be either low-skilled or high-skilled compared to Americans.
 2. Potential immigrants tend to be very low-skilled compared to Americans.
 3. Slightly less obvious difference: Holding overall skill constant, natives usually speak much better English.
- H. This implies that immigration can actually raise wages. Why? Comparative advantage: People with different skills produce more *total* output if they specialize and trade.
- I. Suppose that in a day, American and Mexican women can produce:

	American Woman	Mexican Woman
Computer Programs Written	4	.1
Children Cared For	2	2

- J. Both sides can increase production by immigration and specialization! Have ten Mexican women switch from writing computer programs to childcare (-1 program, +20 childcares), and one American woman switch from childcare to computer programs (+4 programs, -2 childcares). The world is richer by 3 programs and 18 childcares.
- K. As usual, comparative advantage implies mutually beneficial trade even when one side is worse at *everything*.
- VI. Immigration as Trade, II: The Regulatory Barriers
- F. Well-established fact: Immigrants to the First World earn vastly more than seemingly identical people who stayed in their home country.
- G. Question: What happens if we analyze *these* earnings gaps using the same method we use to measure discrimination?
1. Note: Since we're comparing immigrants to people from the same country who stayed home, we're measuring the effect of discriminatory government treatment (some people can migrate; the rest can't) rather than employer discrimination.
- H. Clemens, Montenegro, and Pritchett pursue this question in their paper on "The Place Premium." They use a Becker-type setup to estimate the effect of *mandatory segregation* on wages.
- I. Estimates are massive. Results by country:

Nigeria	16.308	Peru	4.153
Yemen	15.114	Guyana	4.067
Haiti	14.245	Jamaica	3.790
Egypt	13.526	Brazil	3.769
Cambodia	9.139	Nicaragua	3.643
Vietnam	8.395	Panama	3.635
Ghana	8.160	Chile	3.582
India	7.859	Guatemala	3.226
Sierra Leone	7.608	Uruguay	3.181
Cameroon	7.477	Colombia	3.068
Pakistan	7.433	South Africa	2.985
Indonesia	7.069	Paraguay	2.907
Nepal	6.692	Thailand	2.828
Sri Lanka	6.657	Turkey	2.735
Venezuela	6.532	Belize	2.633
Jordan	5.593	Mexico	2.589
Bangladesh	5.487	Argentina	2.486
Ecuador	5.368	Costa Rica	2.194
Uganda	5.286	Dominican	2.084
Bolivia	5.106	Republic	
Ethiopia	4.585	Morocco	2.026
Philippines	4.504		

- VI. Immigration and Wealth Creation, I: Migration and Labor Productivity
- A. If these place premium results are even close to correct, they imply that migration *massively* increases global wealth creation.
 - B. Key intuition: When a Nigerian who produces \$2000/year in Nigeria moves to the U.S., he starts producing 16x as much - \$32,000/year, enriching *the world* by \$30,000/year.
 1. If 15M Nigerians move, global wealth rises by \$30,000*15M=\$450B per year.
 - C. Note: This is *not* the trivial point that increasing population increases the GDP of the receiving country. This is the deep point that moving population from low-productivity countries to high-productivity countries increases GWP – Gross World Product.
 - D. What exactly is going on? For starters, we have comparative advantage. Migration allows specialization and trade.
 - E. Why not just have trade in goods? Simple: Because 80% of a modern economy is services, most of which *must* be traded locally. Consider:
 1. Restaurant meals

2. Childcare and eldercare
 3. Construction
- VII. Immigration and Wealth Creation, II: Effect on GWP
- A. Standard trade models estimate the cost of trade barriers.
 - B. What happens if we use standard trade models to estimate the deadweight cost of immigration restrictions?
 1. Michael Clemens famously does this in his “Economics and Emigration: Trillion-Dollar Bills on the Sidewalk?”
 - C. The estimates are astronomical. From Clemens, with some relevant comparisons:

Table 1

Efficiency Gain from Elimination of International Barriers
(percent of world GDP)

All policy barriers to merchandise trade

1.8	Goldin, Knudsen, and van der Mensbrugghe (1993)
4.1	Dessus, Fukasaku, and Safadi (1999) ^a
0.9	Anderson, Francois, Hertel, Hoekman, and Martin (2000)
1.2	World Bank (2001)
2.8	World Bank (2001) ^a
0.7	Anderson and Martin (2005)
0.3	Hertel and Keeney (2006, table 2.9)

All barriers to capital flows

1.7	Gourinchas and Jeanne (2006) ^b
0.1	Caselli and Feyrer (2007)

All barriers to labor mobility

147.3	Hamilton and Whalley (1984, table 4, row 2) ^c
96.5	Moses and Letnes (2004, table 5, row 4) ^c
67	Iregui (2005, table 10.3) ^{c,d}
122	Klein and Ventura (2007, table 3) ^e

- D. In 2019, estimated GWP was \$142T. So if open borders doubled global production, it would increase GWP by another \$142,000,000,000,000 per year.
 1. Present value with 4% discounting: \$3.6 quadrillion.
 2. Present value with 4% discounting and 2% continued global growth: \$6.8 quadrillion.
 - E. Intuitively, the annual deadweight cost is huge because you are multiplying a huge loss to the world per worker times a very large number of workers.
 1. The NPV is mind-bogglingly huge because the world gets this annual gain forever.
 - F. Disclosure: To capture the full gain, billions of people have to move.
- VIII. CBA and the Downsides of Immigration

- A. The modest proposal: open borders. Welcome the world to live and work here.
 - B. If these GWP numbers are even remotely correct, open borders could have hellish downsides and *still* pass a cost-benefit test with flying colors.
 - C. Why? Because the downsides would have to cause many trillions of dollars of losses, year after year.
 - 1. \$1T - \$1B $\approx$ \$1T
 - D. The vast majority of complaints about immigration are just SDB: vague worries, vivid horror stories, and hyperbolic predictions.
 - 1. "London's not England anymore!"
 - E. CBA, however, insists on seeing price tags, which the most thoughtful critics of immigration sometimes provide.
 - 1. Distributional effects
 - 2. Fiscal effects
 - 3. Cultural effects
 - 4. Political effects
 - F. There are chapters on each of these concerns in my *Open Borders*. Curious? Do the reading.
- IX. Keyhole Solutions
- A. Even if my estimates of fiscal, cultural, and political harm are optimistic, none seem remotely close to trillions of dollars of annual harm. The CBA case for radical deregulation is very strong.
 - 1. But can we do even better?
 - B. A major innovation in medicine: "keyhole surgery." The idea: Surgeons try to minimize side effects by carefully crafting the least invasive approach required to fix the patient's problem.
 - C. Keyhole surgery has inspired some policy analysts to develop "keyhole solutions" for social ills. The idea, again, is to minimize side effects by carefully crafting the least invasive approach required to fix society's problems.
 - 1. Pollution regulations versus pollution taxes
 - 2. Government provision versus vouchers
 - D. When people criticize immigration, however, the proposed remedies have little to do with the specific complaints.
 - E. Instead, the focus is on (a) exclusion, and (b) removal/deportation, despite severe side effects.
 - F. What would keyhole solutions for immigration problems look like? Let's take the soundness of the main complaints about immigration for granted, then consider how you could craft a cheap, humane remedy.
 - G. Immigration and American poverty: If immigrants are reducing the living standards of low-skilled Americans, there's no need to reduce immigration. We could simply charge immigrants an admission fee or extra taxes, then use the revenue to compensate low-skilled Americans.

- H. Immigration and American taxpayers: If immigrants aren't paying their way, we could restrict immigrants' eligibility for various government benefits.
- I. Immigration and American culture: If immigrants aren't learning our language and/or culture, we could make passing grades on language or "cultural literacy" tests a condition of entry.
- J. Immigration and American liberty: If immigrants are bad voters, we could restrict their right to vote.
- K. If any of these alternatives to immigration restrictions seem unfair, they're clearly *less* unfair than preventing people from coming at all.
- L. The Gulf monarchies, the countries with the world's most open immigration, all make heavy use of keyhole solutions.
- M. Are keyhole solutions impossible in Western democracies? Hardly. Many are already in use, even in the U.S.