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Econ 309

Week 1: Cost-Benefit Analysis, Risk, and the Value of Life

I. What's the Point of Cost-Benefit Analysis?
   A. Every government policy has a long list of effects.
      1. Intended outcomes
      2. Unintended outcomes
      3. Direct costs
      4. Indirect costs
   B. Question: Is government policy X worth doing?
   C. Cop-out answer: It's all a matter of opinion/depends on your values/there's no right or wrong answer here.
   D. Cost-Benefit Analysis, abbreviated as "CBA", and sometimes known as "efficiency analysis" or "Kaldor-Hicks efficiency analysis," is social scientists' main attempt to avoid this cop-out answer.
   E. Basic idea: Put a dollar value on (or "monetize") all costs and all benefits. Then sum up.
   F. 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?"
   G. 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?
   H. CBA is not the only alternative to the cop-out answer. See any class in political philosophy.
      1. Utilitarianism
      2. Egalitarianism
      3. Libertarianism
      4. Other
   I. 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.
   J. 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.

II. Cost-Benefit Analysis of Competitive Markets
   A. Recall a standard competitive market. What happens?
   B. In equilibrium, supply equals demand, and society realizes all surplus.

C. According to CBA, this is the best possible result!
D. At any lower quantity, social benefits exceed social costs, so you're missing out on opportunities.
E. At any higher quantity, social costs exceed social benefits, so you're wasting resources on fake "opportunities."
F. If this model fits everything on Earth, free markets automatically follow the logic of CBA!

III. Adding Externalities
A. By definition, a "standard competitive market" has no externalities. Private and social effects are exactly the same.
B. For practical purposes, CBA begins with the realization that private and social effects can differ.
C. Ex: A thief clearly enjoys private benefits of stealing. But looking only at the thief's benefits misses the big picture: The thief makes himself better off by making others worse off.
D. Ex: A person driving a polluting car is better off from driving, but that person isn't the only one who consumes the exhaust.
1. Contrast with: Worker safety trade-offs.
E. How to measure "social benefits"? The same way we always do: willingness to pay.
F. Externalities can be positive or negative.
G. If some people benefit and some people suffer from a policy, the net social benefits are the SUM of the private benefits (positive and negative).

IV. The Tragedy of the Commons
A. Economists usually focus on how ownership gives people incentives to use resources in a sensible way.
B. But 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.
C. Common ownership often 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.
D. 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.
E. 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.
F. That is the benefit of property rights that is absent in the commons - a benefit not just for owners, but for users as well.

V. Cost-Benefit Analysis of Negative Externalities
A. In sum, the basic idea of the tragedy of the commons is that when no one owns a resource, it gets over-used.
B. Question: 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 <u>below</u> the demand curve.
E. CBA: 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. Ex: Pollution. People value better air, but polluters normally have no incentive to care.
G. 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?
H. CBA: With negative externalities, markets produce some products where market value minus the value of side effects is less than their cost.

VI. Cost Benefit Analysis of 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. CBA: 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. 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.
E. Ex: Defense. People value defense, but how can suppliers be paid to provide it?
F. CBA: With positive externalities, markets fail to produce some products where market value plus the value of side effects is greater than their cost.

VII. Cost-Benefit Analysis of Gratis Goods
A. Governments often give costly products away for free (“gratis”). Almost everyone likes this.
B. Question: What does CBA say about such giveaways?
C. Answer: All goods consumed *because* they’re sold below cost lead to waste!

1. Why? Because people value them less than their cost. Like an expensive but unappreciated Christmas present.

D. How to diagram this. Notice the difference between giving unlimited amounts of a good away versus imposing a price control of zero.

E. Positive externalities reduce the problem; negative externalities increase the problem. Real-world governments give away goods with both!

VIII. Why Actions Speak Louder Than Words

A. In practice, some CBAs just ask people for their valuations. This has obvious problems.
   1. Simple innumeracy: "What's 100 cubed?"
   2. Hyperbole: "No matter the cost!"
   3. Embarrassment: "Which do you value more: children's toys or alcohol?"

B. CBA is supposed to use *true* values, not stated values.

C. Ideally, this requires telepathy, which no one has. Right?

D. Alternative: Look at actions! If someone says, "No matter the cost!," but then changes their behavior when the cost goes up, their actions show they actually care about cost after all.

E. This is a very general principle. Examples:
   1. "My religion is the most important thing in my life."
   2. "If it saves one life."
   3. "We refuse to compromise a single inch."
   4. "Never settle."
   5. "Do what you love, and the money will follow."
   6. "X is infinitely better than Y."

F. A classic of "Actions speak louder than words": "If you really hate X so much, why don't you leave?"
   1. LA's Million Dollar Babies

G. "Actions speak louder than words" isn't just great for avoiding absurd conclusions; it also helps CBA reach more specific answers.

H. Ex: Using rents or property values to measure the disvalue of crime.

IX. Risk, Discount Rates, and Cost-Benefit Analysis

A. Question: Suppose a policy has a 10% chance of causing $1,000,000 of damage. How do we count it?

B. Answer: Multiply the loss by the risk. A 10% chance of -$1,000,000 = -$100,000.

C. Moral: Since the real world is uncertain, CBA depends heavily on probability estimates!

D. Question: Suppose a policy causes $1,000,000 of damage 10 years from now. How do we count it?

E. Answer: We discount using the interest rate and temporal distance. If the interest rate is 10% per year, a $1,000,000 loss ten years from now only costs $1,000,000/(1.1^10), the amount of money

we'd need to put in the bank today in order to have $1,000,000 ten years from now.

F. Moral: The higher the discount rate, the less good *and* bad things in the future count.

G. Time discounting bothers many people. Why should a remote loss count less than an immediate loss?
   1. Cop-out answer: Future is less certain. True, but we should handle that with a risk adjustment, not a time discount adjustment.
   2. Better answer: Positive interest rates are a sign that we expect to be richer in the future than today. So it makes sense to borrow against our future wealth.
   3. Best answer: Actions speak louder than words. If you just wanted to maximize your wealth, you'd save every penny above subsistence!
   4. The Benjamin Franklin bequest.

X. Application: The Value of a Life

A. "You can't put a value on human life." This sounds good, but it's absurd.
   1. Whenever you do anything other than the safest possible action, you are putting a value on your life.
   2. Whenever you do anything that other than the safest possible action for others, you are putting a value on *their* lives.
   3. Example: Driving to a restaurant.

B. Moral: There's a trade-off between safety and other goods.

C. Still not convinced? OK, can you put a value on human *time*? Everyone does this routinely.

D. This suggests a simple way to monetize life: Just count the value of the lost time.

E. Does this mean that the value of a life equals a person's salary? No! People clearly value their leisure time, too.
   1. At minimum, you should assign the salary that you *could* have earned if you were a total workaholic. Say 2-3x your potential salary.

F. Added complication: You should adjust for *quality* of life too. How many years of high-pain life would you give up for a year of pain-free life?

G. Does this mean that younger lives are worth more? Of course!
   1. Young people lose more years of life when they die.
   2. Young people have better health.

H. What about externalities? If you die, people will miss you. But who do we miss more: the young or the old?
   1. Obviously the young, as Darwin predicts. Consider the death of a child versus the death of a grandparent.

2. If you're brutally honest, consider how many old people's deaths actually come as a relief to their loved ones.

I. Why bring this up? Lots of government policies are matters of life and death, so you have to assign a value of life to do CBA on them.

XI. Social Returns and CBA

A. Business people care about private returns: If you invest $1M of *your* money, what percent "returns" to *you* every year?

B. "10% return" means "You get back 10% of your money every year."

C. If your return exceeds the market interest rate, you've made an economic profit; otherwise, you've endured an economic loss.

D. Policy analysts who do CBA care about *social* returns. If *humans* invest $1M of human money, what percent "returns" to *humanity* every year?

E. Why is there a difference between private and social returns? Externalities!

F. Semantic equivalence: "Passes a CB test" = "Has a social return > market interest rate." "Fails a CB test" = "Has a social return < market interest rate."