EFFICIENCY AND MARKETS

14.42 LECTURE PLAN 3: FEB 8 2011

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Intro: first several ppt slides.

PASTURE 1: CONSUMERS

LEFT BOARD 1: Utility Max and Indifference Curves

Maximize utility from water W and numeraire N ("stuff"). Budget constraint $Y=p_W W+p_N N$

Set up LaGrangian

Take derivative

Get optimal input demands

Define and draw indifference curves

Define and draw budget constraint

Concepts:

1. Convex preferences. Declining MRS.
    a. How to explain? Mixes better than extremes.
    b. Could rational people not have convex preferences?
2. Price Ratio=MRS. Draw two different price ratios to eventually make a demand curve.

RIGHT BOARD 1: Edgeworth Box

Draw efficient and inefficient allocations

Draw an initial allocation and a budget line.

Derive budget line

Concepts:

1. Two MRS must be tangent, equal price ratio. All consumers' MRS equals price ratio, even if different utility functions.
2. Contract curve
3. Efficiency: do we like some points in the box more than others? Write definition: efficiency = Pareto optimal = Pareto frontier.
    a. What other examples of inefficiency?
4. Do we "like" some points on the contract curve more? Difference between efficiency and equity.
5. How do we know that some allocation is efficient? If it is the result of free exchange. Free exchange leads to Pareto optimal division of goods: (first welfare theorem)
6. Any allocation can be achieved through market exchange: (second welfare theorem)

PASTURE 2: PRODUCERS

LEFT BOARD 2: PPF

What role does the firm play?

Firms transform goods into other goods.

RIGHT BOARD 2: Firm Profit Max and Production Function

Firm maximizes profits.

Production Function: $W = N^{\gamma}L^{1-\gamma}$, $\alpha<1$

Get per unit of labor

Draw production function on right side

$\pi=p_W W-p_N N - C$

All per unit of labor

Substitute W into profit function

Make sure the sign on N is negative

Optimize (take derivative)

Concepts:

1. Derive/draw MRT
2. Derive/draw isoprofit lines
3. MRT=price ratio (mathematically and graphically)
    a. This must hold for all producers.
    b. Draw two different price ratios to eventually make a supply curve.

PASTURE 3: CONSTRUCTING SUPPLY AND DEMAND CURVES

LEFT BOARD 2: Draw supply and demand

Where do these curves come from?

Are these convex or concave? (S is convex here, D is concave)

What happens when α increases? Income Y?

What happens when γ increases?

Are there other ways to get supply and demand (Heterogeneity)

Are these individual or aggregate supply and demand curves?

Under what condition same? (Homogeneity)

This whole supply and demand system is normalized per person!

But there is CRS – this generates perfectly elastic supply.

Concepts:

1. Consumer and producer surplus.
    a. Is CS defined with Cobb-Douglas?
    b. CS+PS maximized at equilibrium
2. =>First welfare theorem: Market eqm is pareto optimal
    a. What did we implicitly assume in getting to the efficient outcome?
        i. Complete property rights. (What if there is no price on the water?)
        ii. Atomistic participants. (What if market power?)
        iii. Perfect information. (What if people don't know the value of clean water?)

iv. No transactions costs. (How is the firm going to charge one rupee for every bucket of water?)

PASTURE 4: WELFARE THEOREMS

RIGHT BOARD 3: Welfare theorems
Left: Assumptions
Right: Theorems 1 and 2

Assumptions: How these break down in other settings outside of water?

PASTURE 5: BADS

Now reframe entirely: the firm consumes water (generates water pollution) and generates stuff.
Call the firm a "consumer of clean water"
Is price positive or negative?
Is demand upward or downward sloping? (Still downward sloping.)

BACK TO LEFT BOARD 3:Draw supply and demand for water pollution
Concepts

1. MRT needs to be equal for all producers: equimarginal principle
    a. Why this is not trivial: guaranteed by prices for market goods. But command and control regulation doesn't require this.
2. What if no price of water pollution? Then firm will produce a lot
3. Where should the price of water pollution come from? MRT=MRS=Price ratio

Segue to CBA:
What if I had a policy that forced producers to reduce water pollution?
Would this be a good thing or a bad thing? How to evaluate?
Evaluate based on welfare: Consumer and Producer Surplus

READINGS FOR NEXT TIME

Arrow et al Science Policy Form
Kelman and responses
Sunstein New Republic

14.42 / 14.420 Environmental Policy and Economics
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