Econ 1101
Spring 2013
Week 8

Section 038

3/13/2013

Announcements

- Aplia homework is due Friday night, 11:45pm.
- Shorter lecture today, recitation at 7.00pm
- Spring break next week! No classes!
- Exam reweigh: To give an incentive for students who did not do as well on midterm 1 to study hard for midterm 2, and for students who did well on midterm 1 to continue working hard, we offer this solution:
  - If you do better on midterm 2 than midterm 1, we will use a different weighing scale than on the syllabus.
    - Syllabus: Midterm 1: 20%, Midterm 2: 20%, Final 35%, Debate 5%, HW 20%
    - New scheme (if you do better on MT2): Midterm 1: 10%, Midterm 2: 25%, Final 40%, Debate 5%, HW 20%

Agenda for today

- China and US trade
- Theory of Public goods
- Introduce Consumer Theory:
  - Budget Constraint
- Introduce preferences:
  - Perfect Substitutes
  - Perfect Complements
  - Decreasing marginal rate of substitution

China/US trade

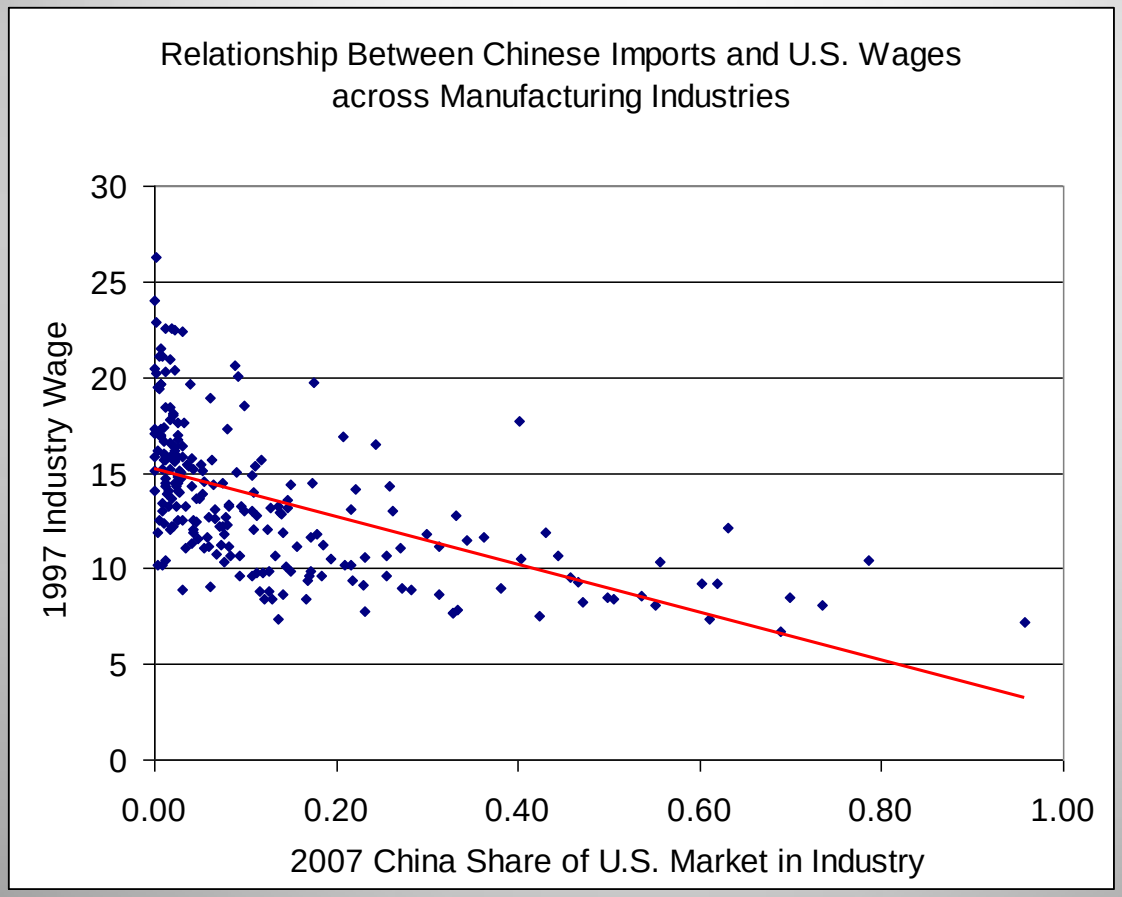
- Some industries are intensive in low-skill labor. **China has a comparative advantage in these**.

- Other industries are intensive in high-skill labor and high technology. **The U.S. has a comparative advantage in these.**

- The homework provides some evidence that the pattern of trade is consistent with specialization according to comparative advantage. (Note: you still have to do the homework to calculate the slope of the regression line!)

- Low skill industries tend to pay low wages. There is pattern in the data that China has tended to gain the most market share in those industries that paid low wages within the US

Example: House slipper manufacturing wage = $7.16 in 1997. As of 2007, this industry has been virtually wiped out by Chinese.



中国

China

美国 US

UNIVERSITY OF MINNESOTA
Driven to Discover℠

assembly of iPad

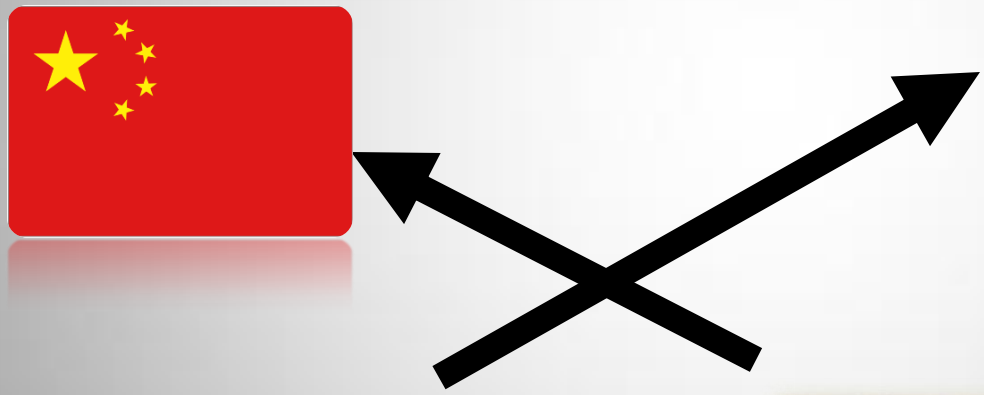
R&D for iPad

- Manufacturing jobs that involve labor-intensive, repetitive tasks in the manufacturing of standardized good have been wiped out in the U.S.
- The textile and furniture industries, that had earlier located in places like North Carolina for low wages, have been decimated.

- One take on U.S-China trade is that it is simply mutually beneficial Robinson-Friday trade, based on comparative advantage.
- There may be more to it than that, and we will look at three issues.

Issue 1:

Much of trade looks like:



U.S. seems to have a comparative advantage in consumption!

- Robinson sits on his butt and gets both coconuts and fish from Friday. Robinson promises to give some of his island to Friday in return.
- U.S. is paying for imports by going into debt.
- U.S. blames China for manipulating the Renminbi to promote exports and discourage consumption. (See the news accounts in Reading 5)
- U.S.can't really be viewed as innocent bystander, as it engorges itself on a consumption binge.
- Germany, like China, has a huge trade surplus. Why is Germany saving and US not saving?

Issue 2:

Much of trade looks like:

中国

$0

For example, Microsoft makes tiny revenues there, even though there are more PCs with Windows in China than in the U.S.

Revenues are low because:

(1) It is easy to make illegal copies, and many people get Windows that way.

(2) To actually get some people to pay rather than use illegal copies, Microsoft has to set really low prices in China.

(3) How about those knock-off Apple Stores?

- In actuality, U.S. firms are making some money in China from intellectual property, but at a lower rate than we might expect, given the size of their economy.

- Royalty and License Fee data for 2011 from the Bureau of Economic Analysis to US from countries. (in billions $US)

Country	Royalties to US ($US Billions)	GDP ($US Billions)
China	4.1	7,298
Japan	10.6	5,866
Korea	4.5	1,116
Austrialia	3.3	418

Issue 3:

- There is little doubt that China is aggressively subsidizing industries of the future, like green energy. The price of solar panels has fallen by two thirds.
- Should we send the Chinese premier Wen Jia Bao a thank you note for cheap solar panels? If you think this is a strategic industry with knowledge spillovers and increasing returns you probably don't want to send the thank you note.
- The solar panel industry here, of course, doesn't want to send a thank you note. In the past, they filed a complaint about Chinese subsidies, asking the U.S. to respond with a 100% tariff on Chinese imports.

Public Goods

One more visit to Econland:

The Widget, a private good.

New words:
Rivalrous in consumption
I eat it, you can't.

Excludable
People can be prevented from consuming it.

These are the two characteristics of a private good.

Conversely

Nonrivalrous in consumption

One person consuming the good doesn't take anything away from another's ability to consume it.

- Tornado siren. I hear it, you can still hear it.
- Watching a TV show

Nonexcludable

- Can’t prevent people from consuming the good.
- Tornado siren. Can’t set it up so that only those paying for the service get to hear it. (Unless make it work through cell phones)
- TV programming? Once was not excludable (old fashioned over the air). But now can be excludable with pay-for-view, etc.

Public Goods:

- Nonrivalrous
- Nonexcludable

Examples:

- Tornado Sirens,
- Street lamp
- National Defense

- Research (if no patent system)

- Music and Film (if no intellectual property production)

Efficient Provision of Public Goods vs. Efficient Provision of Private Goods:

Private Good -> rule: should make another unit of output and give it to a person if that person's marginal willingness to pay exceeds the marginal cost.

- D1: values a widget $9
- S1: can produce at $1.

Make the widget!

Different story with public goods.

- I never told you this, but Econland has no sun! (So it's dark all the time)
- Proposal: Build an artificial sun, will light all of Econland.
- Cost of project is $20.
- What is willingness to pay?

If this were a private good, at a cost of $20 per unit, the efficient amount would be zero.

Name	would pay	Name	would pay
D1	9	S1	0
D2	8	S2	0
D3	7	S3	0
D4	6	S4	0
D5	5	S5	0
D6	4	S6	0
D7	3	S7	0
D8	2	S8	0
D9	1	S9	0
D10	0	S10	0

Public good: Add the willingness to pay of each together.

- If the artificial sun is built, all will get to enjoy it.
- Social Marginal Benefit from building the artificial sun is:

9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1 = $45.

Which is greater than $20.

So socially efficient to build the artificial sun.

What's the problem?

In the free market, there is a free rider problem.

- Worth it to do, but no one willing to put up the whole amount to do it themselves.

- Have a role for government.
  - If the government were to tax D1-D4 $5 each, there would be a Pareto improvement

- One last point: because of technological change things can become excludable that before were not excludable, and the other way.

Suppose we can build an artificial sun where you need a certain kind of sunglasses to see the light.

Entrepreneur build the artificial sun, sell sunglasses to people for $5.

D1-D5 buy, get $25 in revenue. Pays for the $20 investment.

The good is now excludable.

Key point: will need intellectual property protection.

- If someone can sell bootleg sunglasses, then the entrepreneur unlikely to be able to make a go of it.
- So won't get the investment in the first place.
- Economic logic of intellectual property protection like patents and copyrights

Common Resources

- Nonexcludable
- Rivalrous

Example: world fishing stocks

- Can be difficult to exclude people from fishing the oceans.
- Certainly rivalrous as overfishing has depleted important fish stocks.

- "Tragedy of the Commons"

- Way forward? Make fish excludable? (Through fish farming?)

Consumer Theory

- So far, we have only assumed that demand is given and predetermined
- However, we can go one step back and figure out how demand was found in the first place
- What do we need to figure out demand? For example, when you go to the grocery store, what determines your demand for steak?

Budget Constraint

Suppose:

- Goldy has income: I = $24
- Price of pizza: P_{pizza} = $4 slice
- Price of beer: P_{beer} = $2 bottle

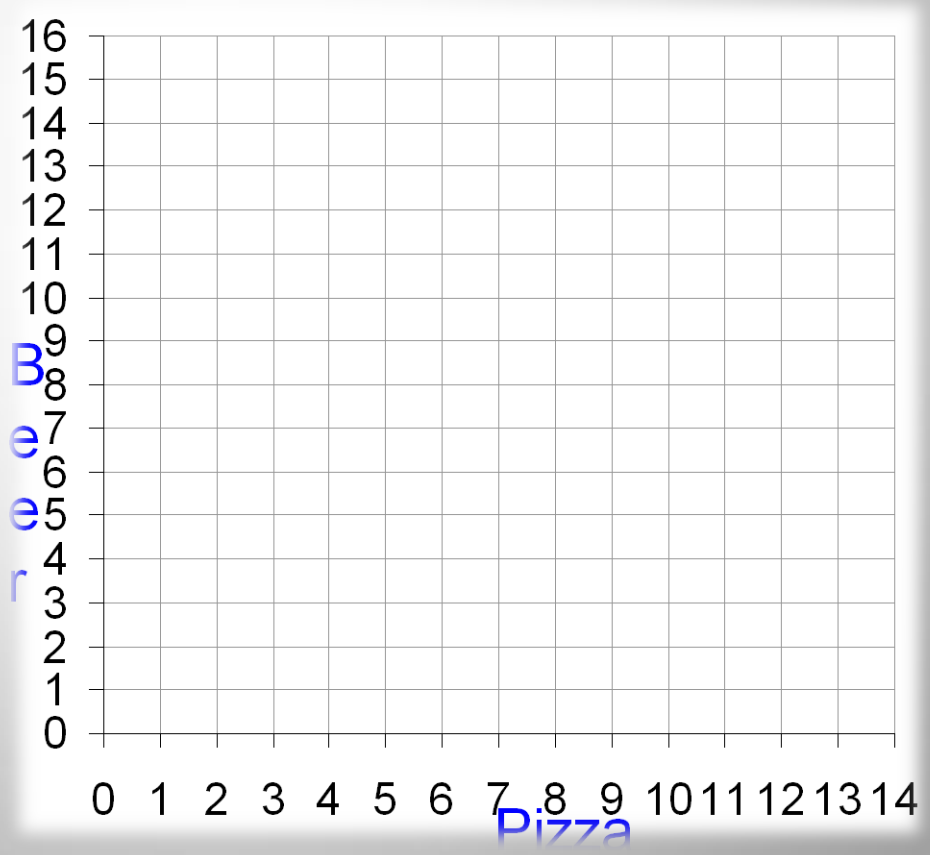
- Make a table of what Goldy can afford.

Horizontal intercept = I/P_{pizza} = \$24/\$4 = 6 pizza

Vertical intercept = I/P_{beer} = \$24/\$2 = 12 beer

Slope = P_{pizza}/P_{beer}

= 4/2 = 2



Key thing to know:

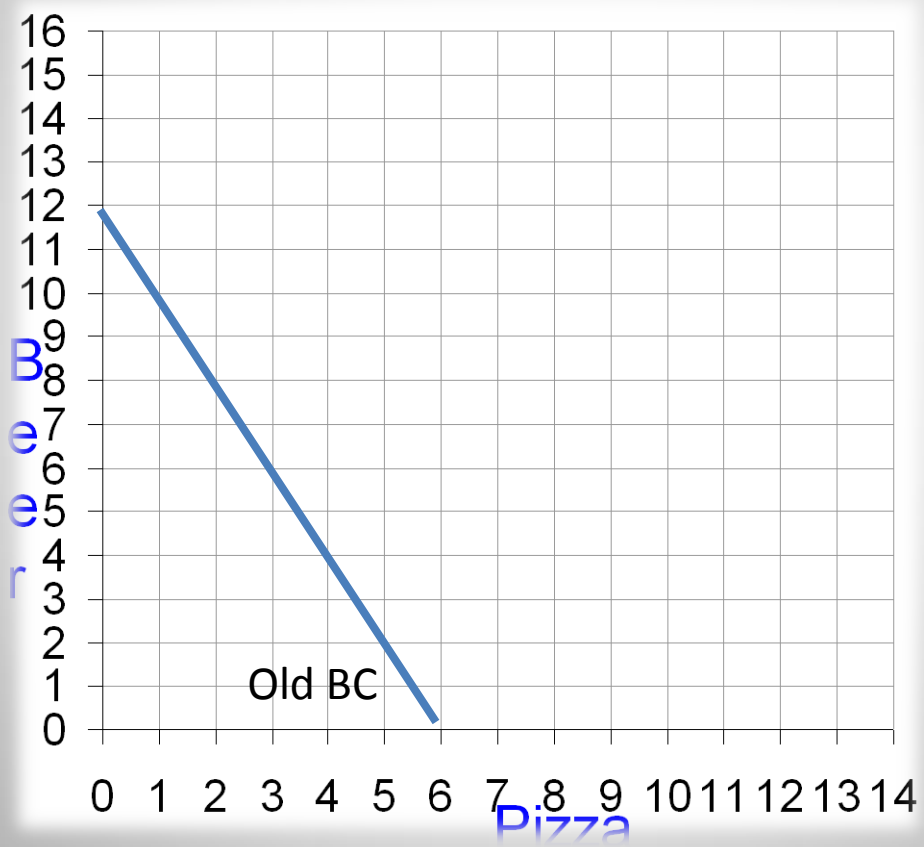
Slope of budget constraint is

Opportunity Cost of 1 more pizza (in terms of beer)
(Since pizza is on the X axis)

- 1 more slice of pizza costs 2 bottles of beer.

What happens when price of pizza falls to P_{pizza} = $2?

- New budget constraint.
- Opportunity cost of one pizza slice?


16
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Beer
Old BC
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Pizza

Budget Constraint

Budget constraint tells us what the consumer can do.

What does the consumer want to do?

Depends on the preferences of the consumer.

Consumer will get different utility from different combinations of pizza and beer.

Will make the choice that maximizes utility. We will call this choice the optimal consumption bundle.

Preferences

Budget constraint tells us what the consumer can do.

What does the consumer want to do?

Depends on the preferences of the consumer.

Consumer will get different utility (happiness) from different combinations of pizza and beer.

Will make the choice that maximizes utility. We will call this choice the optimal consumption bundle.

We will look at 3 different types of preferences

To introduce preferences, let's look at three nice dudes!

Assume the ducks consume only pizza and beer.

- All the ducks have the same income and face the same prices (same budget constraints, as we just looked at).
  - Income = $24
  - Price of pizza = $4
  - Price of beer = $2
- <u>But differ in preferences</u>.

We will explain their preferences and then look at their choices.

Case 1: **Huey**
(Perfect Substitutes)

Huey gets utility from calories (the more the better).

Suppose pizza has 200 calories and beer has 200 calories

Utility = $200*Q_{pizza} + 200*Q_{beer}$

What bundle maximizes utility? What is the total utility?

- Remember $P_{beer} = 2$, $P_{pizza} = 4$.

One thing we could do, if it is not as obvious as this example was, is to calculate utility per dollar spent on each good:

Pizza:

Beer:

Beer is the best value (at these prices) in terms of utility per dollar spent.

Huey will spend all his money on beer.

Q_{beer} =

Q_{pizza} =

Let's see how we can represent this on our diagram:

- Gives us another way to figure out the optimal consumption bundle.

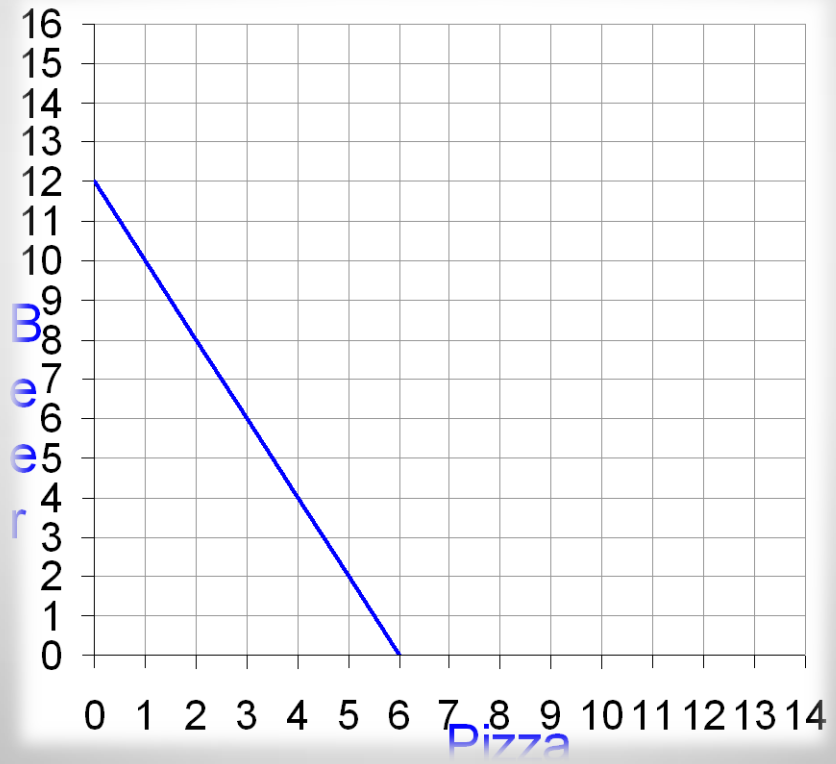
Introduce concept of Indifference curves:

- Combinations of beer and pizza that give the same utility (the consumer is indifferent.

Indifference curve (IC) through $Q_{beer} = 12$ and $Q_{pizza} = 0$

Utility = $200*Q_{pizza} + 200*Q_{beer}$

- Get 200 each way, so trade off one-for-one.



- Of course, Huey also has preferences for any other combination of beer and pizza. They can be shown on other indifference curves (we usually just draw a few, but just because they are not drawn does not mean they are not there). Note that utility was calculated from the utility function for Huey.

Rule: pick the bundle on the budget constraint that gets to the highest indifference curve

The slope of indifference curve is the Marginal Rate of Substitution (MRS)

In the first example, it's one for one. (value of one more pizza slice in terms of beer)

Look again at

$Q_{beer} = 12$ and $Q_{pizza} = 0$ on the budget constraint.

At this point:

Value of one more unit of pizza is one beer (MRS)

Cost of one more unit of pizza is two beers (Opportunity Cost)

Case 2: **Dewey**

<u>Fixed Proportions (Perfect Complements)</u>

Dewey is very particular:

A meal: one beer and one pizza (he is equally as happy with two beers and one pizza as he is with one beer and one pizza because it's still only one meal with two beers and one pizza)

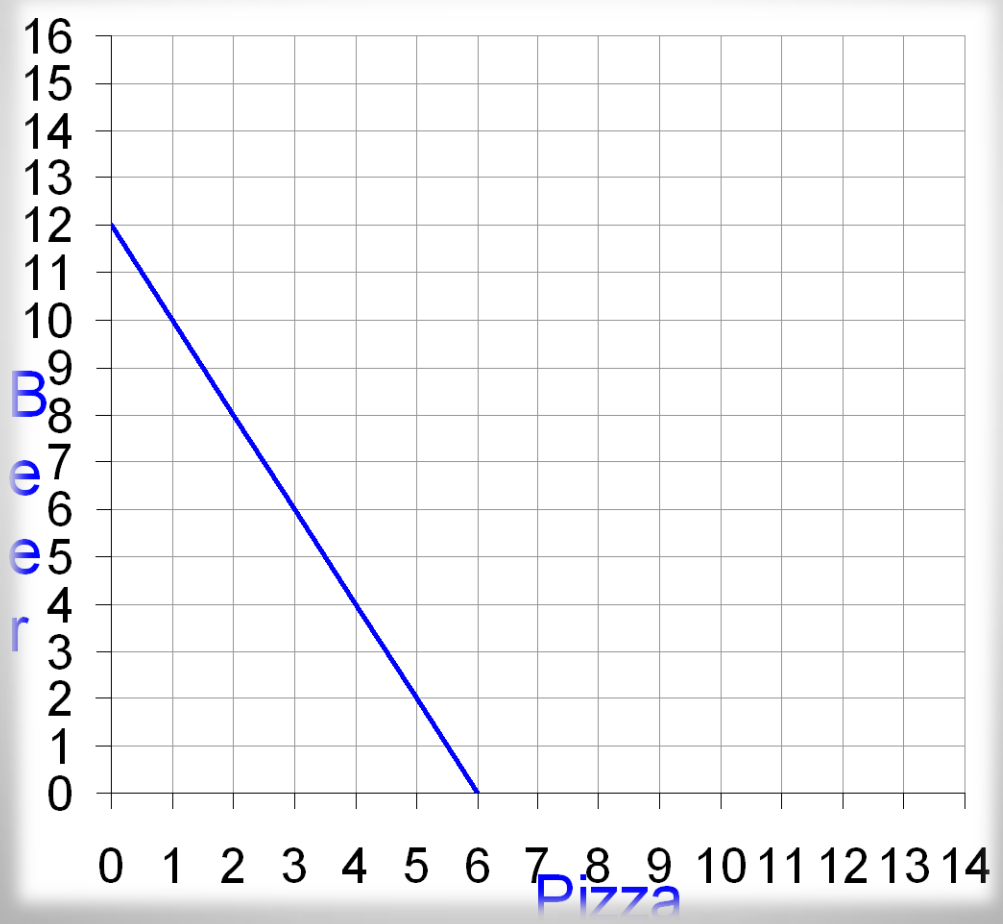
Utility equals number of meals.

Suppose Dewey has I = 24 just like before and P_{pizza} = \$4 and P_{beer} =\$2

What is optimal consumption bundle?

How much for a meal?

- Picture: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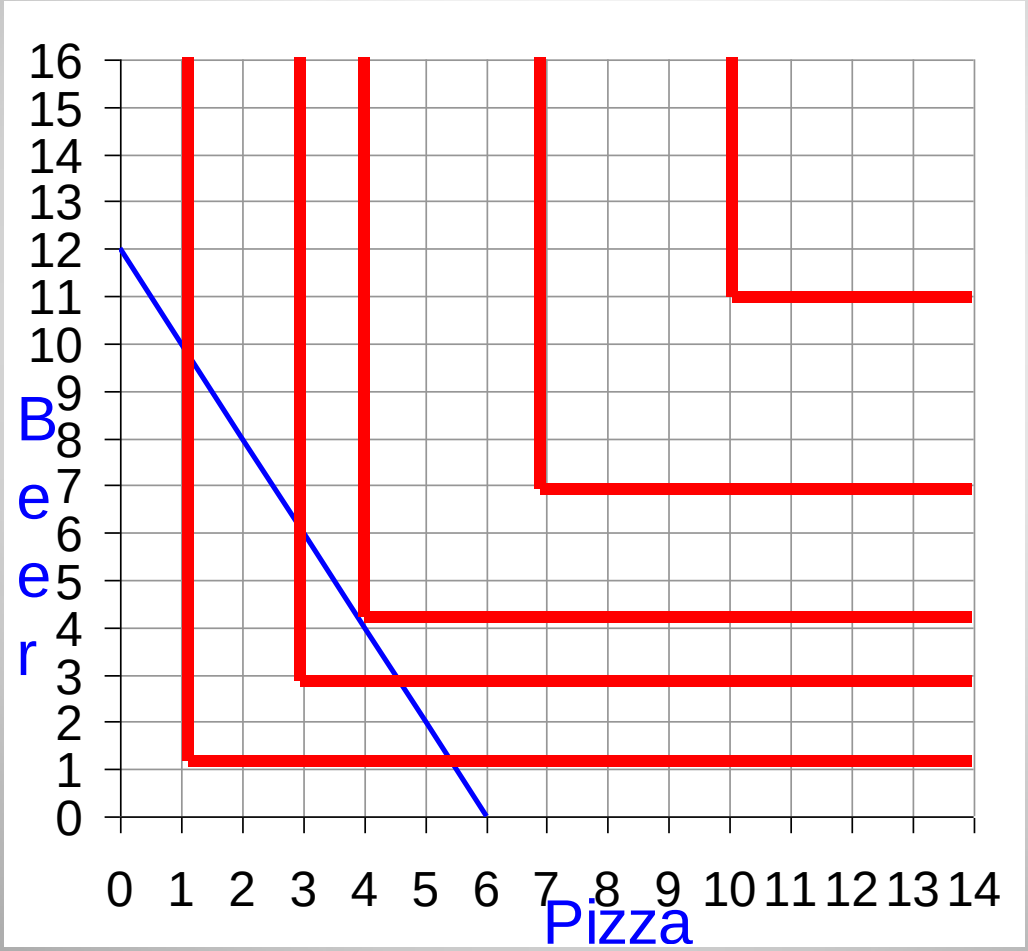
Beer
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Pizza

Remember, the higher the indifference curve, the better. These right angle ICs make sense for perfect complements (fixed proportions) because Dewey is equally happy having 4 beer and 4 pizza and 5 beer and 4 pizza, or 6 beer and 4 pizza,…, or 100000 beer and 4 pizza, since he only gets 4 meals out of it. That's why the points (4,4), (4,5), (4,6),…, (4,10000),… are all on the same indifference curve.



Case 3: **Louie**

In between these extreme cases (our “normal” case)

(Diminishing marginal rate of substitution)

Meaning, as he eat more pizza, his willingness to give up beer to get even more pizza goes down.

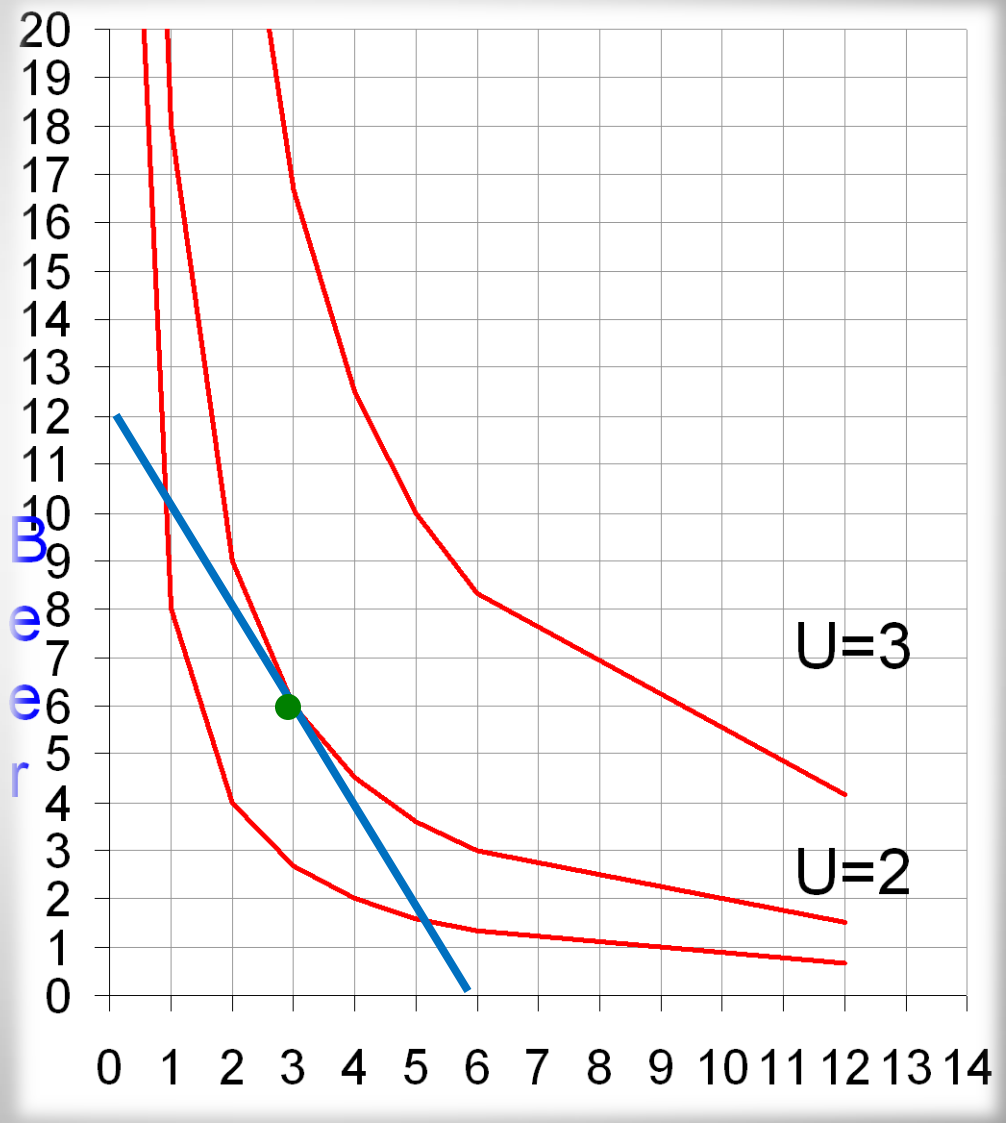
Means indifference curves have a bowed shaped.

How do we find the slope of the a curve? Put differently, how do we find the marginal rate of substitution of these “bowed” indifference curves?

Suppose
P_{Beer} = \$2, P_{Pizza} = \$4,
I = \$24

The green point is where we have the highest indifference curve that has a consumption bundle we can afford

The green point is our <u>Optimal Consumption Bundle</u>



For decreasing marginal rate of substitution, the optimal consumption bundle satisfies two conditions:

(1) On budget constraint and

(2)

$$MRS = \frac{P_{pizza}}{P_{beer}}$$ (which is just slope of the BC)

Marginal benefit of pizza (in beer) = Marginal cost of pizza (in beer)