BCA 1/14

<u>What characteristics does a market solution have?</u>
How do markets achieve a solution? Through the normal supply-demand dynamics.

Where do these curves come from?

Demand

Assume a consumer-good market. What motivates consumers to buy and change consumption? When price rises, quantity purchased drops.

How do demanders make their decisions? principles of optimization say that if you look at the marginal costs & benefits and compare them, the result will tell you what to do.

If MC < MU, do more (increase consumption).
If MC > MU, do less (decrease consumption).

Ideally, MC = MU; this is an equilibrium state because there is no incentive for consumers and producers to change their market decisions.

For consumers, the marginal cost of demanding another unit (MCD) is the price. (this requires the assumption that all consumers are price takers; otherwise adding one unit of consumption would bid up the price not only of the next unit, but of all other units.)

What is the marginal benefit (MBD) to consumers of getting the good? That is marginal utility. We assume that marginal utility is already measured on a 1-unit = $1 basis, so MBD = MU.
Marginal utility under this assumption is the same as the marginal willingness-to-pay of the consumer; it is the maximum dollar value that that consumer will pay for the next unit of the good.

Therefore, in equilibrium, P = MU. Only if we have a true free market and consumers are free to optimize by adjusting consumption does this equality hold. Usually, of course, it doesn't hold in real life.

Supply

How do suppliers decide how much to produce and sell? Much as consumers made their decisions.
Marginal benefit to the firm of producing (MBF) = P (again, this assumes that firms are price takers--small and numerous).
MCF = MC (distinguish between marginal cost of production to the firm and marginal cost of production to society, MCS. May not always be equal--we'll get to that later).
MC = P
The shape of the supply curve is harder to figure out (at least for direction) than for consumers. May have many different shapes.

examples: if some of the resources necessary for production are fixed, you get diminishing returns, so the marginal cost rises as Q rises. However in the long run, all the inputs can vary, so firms would be able to perfectly replicate what was done for the

previous one and the supply curve would remain flat (constant returns to scale). Finally, MC can decline when Q rises if there are increasing returns to scale.

Equilibrium: MU = P = MC. What does that tell us?

If MU is the only benefit and MC is the only cost, we have an optimal level of the good being supplied. (Prefer "efficient" since optimality is a smaller set than efficient--there are more requirements for optimality than for efficiency).

If equilibrium conditions hold, government intervention is not necessary, but this is rare. (This feature is more interesting to us when it does not hold--when the market doesn't work.) When this is true, the price measures both the benefit to consumers and the cost to producers.

What information can markets give us?

Even when the market doesn't work perfectly, we may know enough about the departure to use the price as a partial measure of costs and benefits and what goes on in the economy.

<u>The market solution is efficient in two ways</u>

P and Q move until MC = MB, thus attaining the efficient level of output.

The right economic actors are present and served.

<u>Consumers</u>:

In equilibrium, all units being sold are going to consumers who have marginal values at least as high as the price; consumers with high valuations for the good will be the first to receive the good, with lower-valuing consumers entering the market as the price drops from infinity. This means that those who value the good most highly receive the good, which maximizes society's benefit from consumption (this only holds to the extent that everyone who would derive utility from consuming the good can afford to participate in the market at a level that reflects that value).

<u>Producers:</u>

In equilibrium, all units being produced are being made by those who have marginal costs no higher than the price; the lowest-cost producers are the first to enter the market, with higher-cost producers entering as the price increases from zero. In the other direction, the most efficient producers are the ones who survive in the market as prices drop.

<u>Result:</u>

The model implies that when equilibrium conditions exist, goods are being produced at the lowest possible cost and are generating the highest possible benefit.

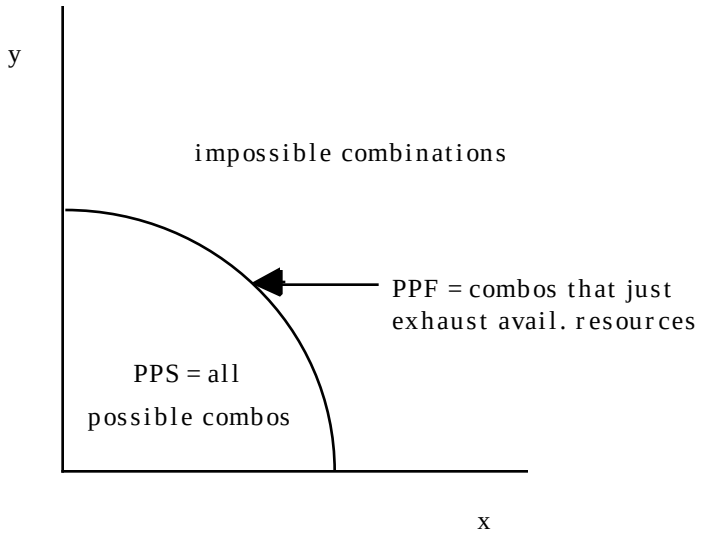
Note: In the long run, if there is free exit and entry into the market, excess profits to producers disappear. Differentiate between rents (excess profits) on capital and the normal return to capital, which is incorporated into MC in the long run. We don't know whether firms are making more or less than a competitive return to investment in the short run, and we don't care. We know, however, that there are no excess profits in the

long run.

All of the foregoing was partial equilibrium model.

General equilibrium model

Extremely hard to do in real life, so we simplify down to two-good economies.



assume that both x and y are consumer goods. People use them in production and consume them themselves.

Production possibility frontier = all combinations of goods that just exhaust available resources (represented by the curve to the left).

The extremes of the frontier are the intercepts on x and y, where all resources are devoted to producing a single good. Intercepts are extreme allocational decisions. Presumably both goods are good to have.

Production possibility set = all feasible combinations of goods given available resources. This includes all points on the axes and the frontier plus any point within those bounds.

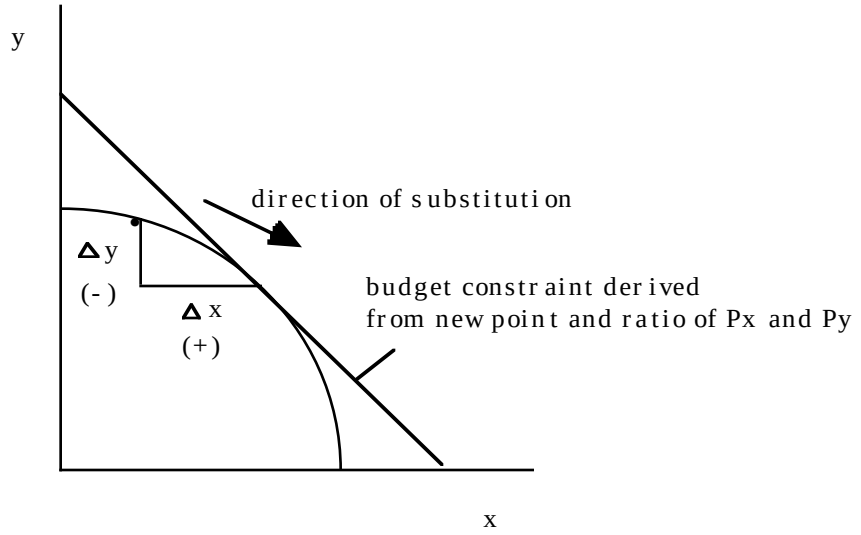
(We assume a closed economy: no international trade).

Why is the PPF curved?

If it were drawn as a straight line, it would imply that all resources are equally productive in all sectors and that all resources are not fixed, but can freely move from one sector to the other. Bowed because in the short run, there are some factors of production that are fixed (you can't take them away from producing one good in favor of another). Once some factors are fixed, you get the declining marginal returns effect for those factors that vary. As you take more and more variable factors out of x and put them into y, the returns decline (if you start at the axis, they're huge in the beginning and decrease as you continue). Bowing also occurs because resources may be more suited to producing one good than another (land & labor, food & clothing example). If you're at an extreme and want to move, you take out the factors that aren't producing

very much x; but they'll produce lots of y. As you take more of the factor from x, you're taking away more of the x-useful part of the resource.

Suppose you start somewhere on the PPF.



What we want to know: how much y must we give up to get more x, not in dollar terms, but rather in output of the other good foregone (opportunity cost)? This is the Marginal Rate of Transformation, which equals the slope of the PPF.

What happens as we move along the curve?

Resources are released by $\Delta y<0=-MCy\Delta y$ (can also say as = $-\Delta y*Py$)

Resources needed for $\Delta x>0 = MCx(\Delta x)$.

If the beginning and end points are both on the PPF, then

$-MCy\Delta y = MCx\Delta x$.

If we divide through, we get $-\Delta y/\Delta x = -MCx/MCy$. This is important because this is the MRT.

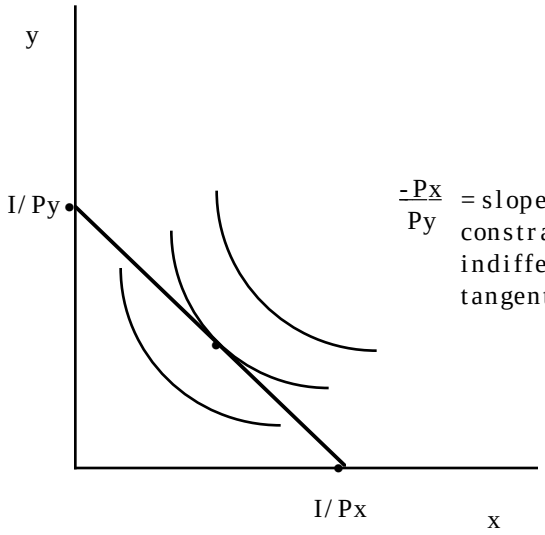
What are competitive producers going to do? Price-taking producers are going to behave as they do in partial equilibrium, that is, responding to price and changing consumption until Px = MCx and -Py = -MCy. Dividing one equation by the other gives you a second set of ratios: Px/-Py = MCx/-MCy = MRT.

What points give you a certain outcome? PxX + PyY = c (budget constraint formula) Rearranged, Y = c/Py - PxX/Py. Note that the slope is negative, so it's -Px/Py.

Once we have determined a point on the PPF, we can derive the budget constraint because we know it's tangent to the PPF with the combination of prices that exist in our market.

Can't go outside of the PPF because the resources aren't there. Selects the bundle of goods that maximize the value of the economy's output at the prevailing prices. Note that we don't know that the prices are correct.

Demand side:



$\frac{-Px}{Py}$ = slope of budget constraint AND slope of indifference curve at the tangential shared point.

PxCx + PyCy = I = budget constraint

What consumers can do: spend to the limit. The intercepts are I/Py and I/Px and the slope is -Px/Py.

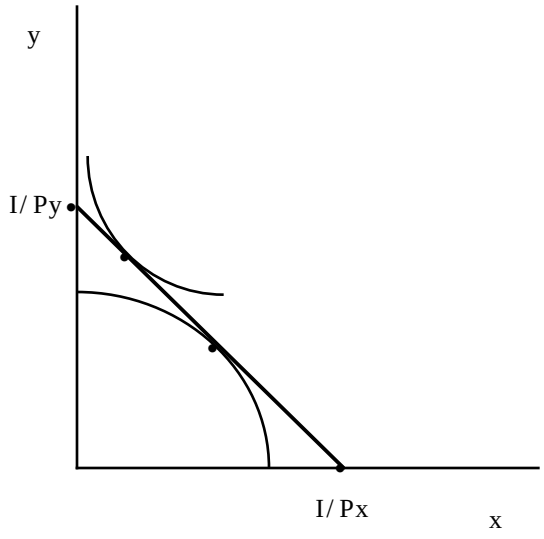
Assuming that consumers have some ordering of relative preferences at different combinations of x and y, you get a series of indifference curves.

The theory states that to maximize benefit, you choose the indifference curve that is just tangent to the budget line.

MRS = Marginal Rate of Substitution = slope of indifference curve = -Px/Py.
At the point of tangency, the slope of the indifference curve is equal to the slope of the budget constraint.

MRS is a ratio of marginal utilities: -MUx/MUy, just as MRT is a ratio of marginal costs: -MCx/MCy.

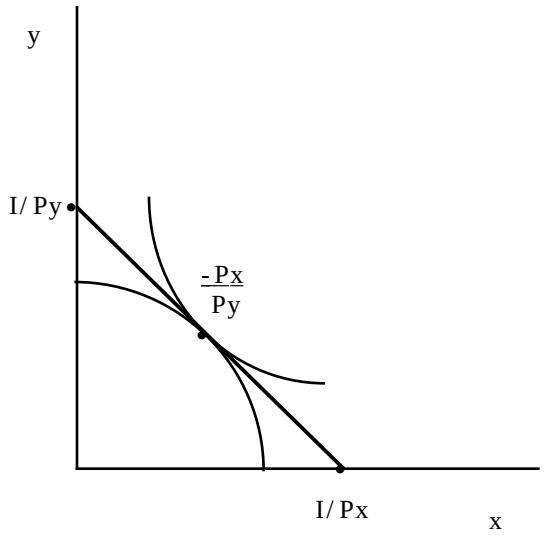
Assuming that all consumers own all the factors of production and all the firms, income is equal to output. This is important because all consumers have the same budget constraint. The price line for the general economy therefore becomes the budget line for consumers, and we can place all of the curves on the same graph.



When the two points of tangency are not the same, the prices in the market are not market-clearing equilibrium prices.

In the graph shown, we have more demand for y than we want and less demand for x than we want. Therefore, the market-cleraing price of Y should be higer and the price of x lower.

When the points of tangency are shared, prices are market-clearing and you have equilibrium. A competitive economy not only equates marginal costs and marginal benefits, but maximizes the value of the goods to both consumers and producers.



The conditions for equilibrium on the supply side are equal to those on the demand side.

MRT = -MCx/MCy = -Px/Py = -MUx/MUy = MRS. This is like what we did in partial equilibrium, but in ratio forms.

If some of these market participants have market power or if the government interferes, these results will not occur. Missing equilibrium is more common than reaching it.

When does this competitive model not work and why?

Monopoly: Monopolists set prices as high as possible above MC in order to generate monopoly rents. In terms of allocation of resources, this situation means that the marginal benefit is greater than marginal cost (because consumers are still price takers), so we should expand output.

External economy: marginal benefit to society is greater than the marginal utility to direct consumption (vaccinations).

External diseconomy: marginal costs are borne by society above what is paid by the firm (pollution).

TO BE CONTINUED NEXT TIME