The Edgeworth Box

The Basic Theorem

- The basic theorem in welfare economics:

  A market, exchange, economy will achieve efficient resource allocation.
- We intend to show the basics of that proof.

Some Basic Assumptions

- A simple economy:Harry and Sally.

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- There are two factors of production, capital, K, and labor, L.

$$L = L_H + L_S$$

Some Basic Assumptions

- A simple economy:Harry and Sally.
- There are two factors of production, capital, K, and labor, L.

$$L = L_H + L_S$$

- These two factors of production can be used to produce either apples or bananas.

Three Basic Questions

- How many apples and how many bananas should be produced?

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- How should the apples and bananas be allocated between Harry and Sally?

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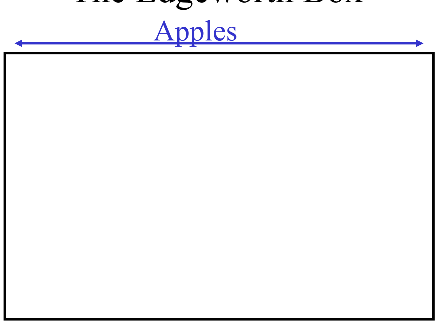
- How many apples and how many bananas should be produced?
- How should the apples and bananas be allocated between Harry and Sally?
- How should capital and labor be allocated to the production of apples and bananas?

The Edgeworth Box



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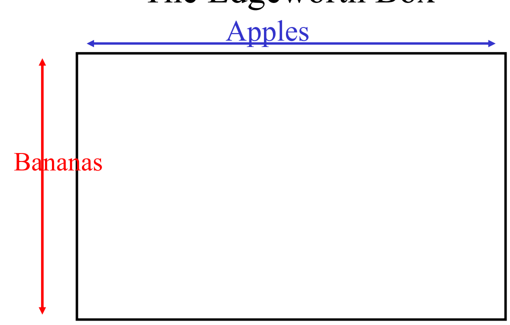

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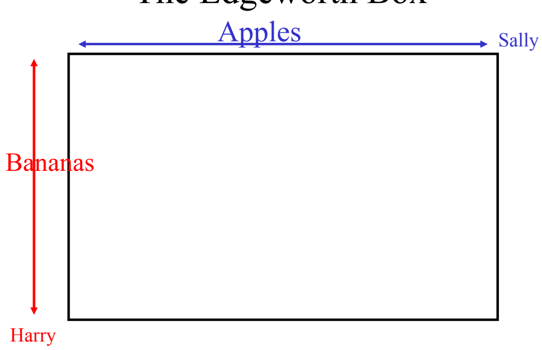

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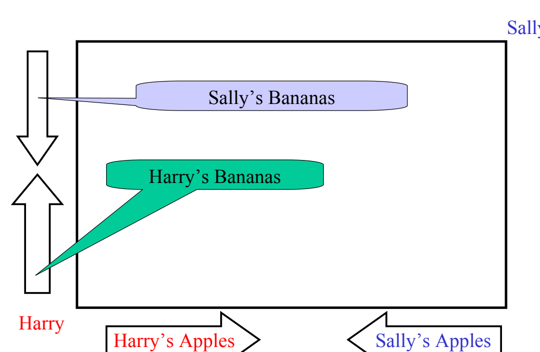
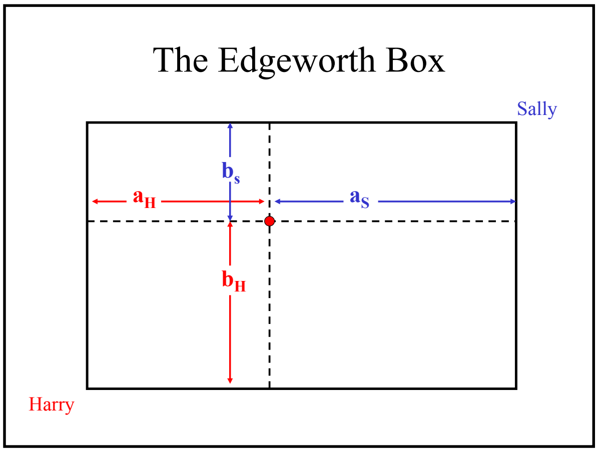
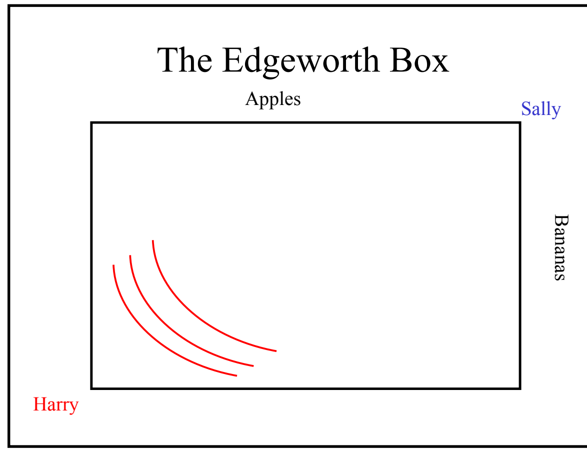
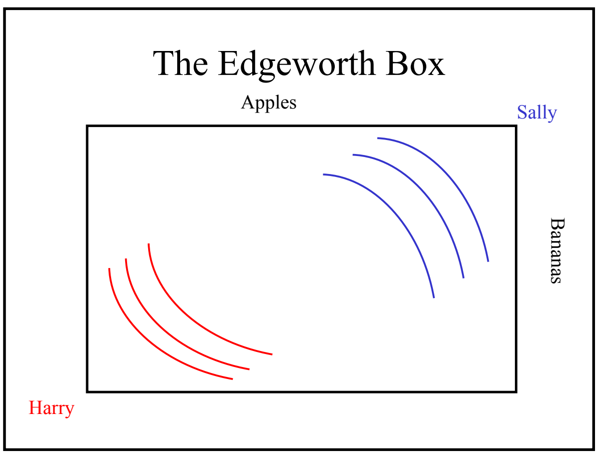



The Edgeworth Box
Sally
b_s
a_H
a_S
b_H
Harry


The Edgeworth Box
Apples
Sally
Bananas
Harry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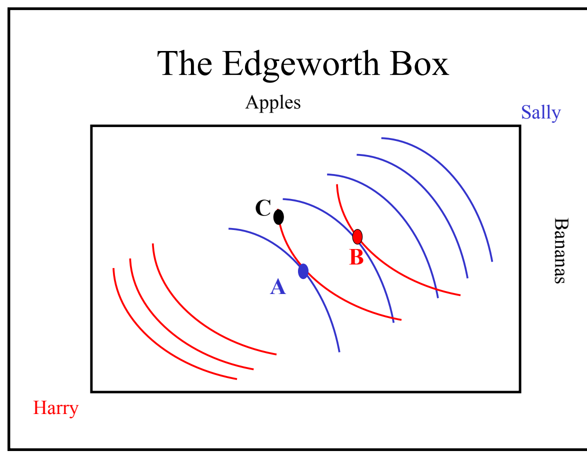
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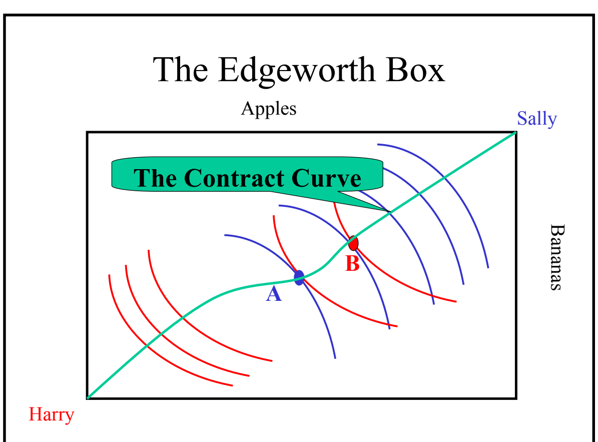
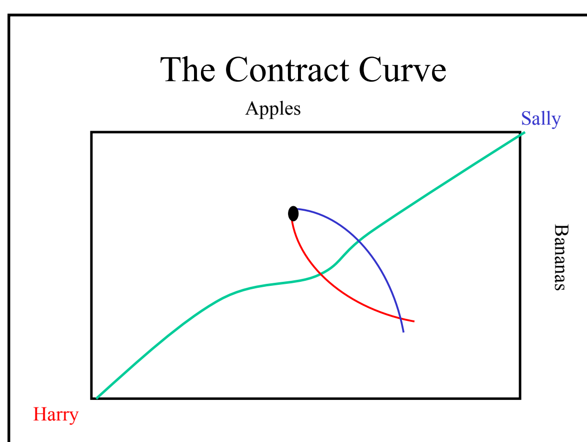
Sally
C
B
A
Bananas
Harry


The Edgeworth Box
Apples
Sally
The Contract Curve
B
A
Bananas
Harry


The Contract Curve
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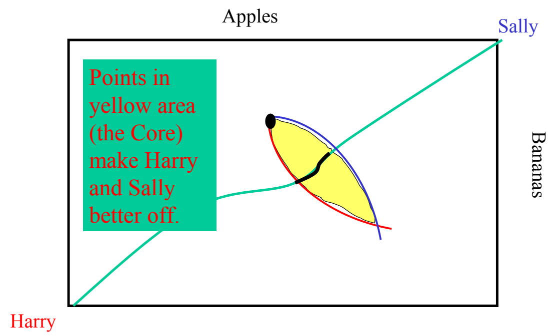
The Contract Curve



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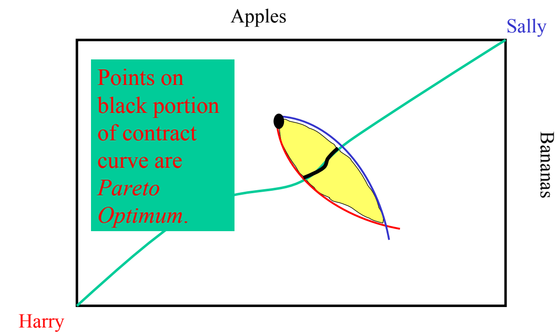

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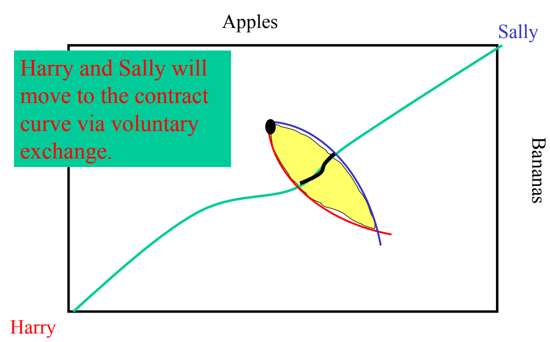

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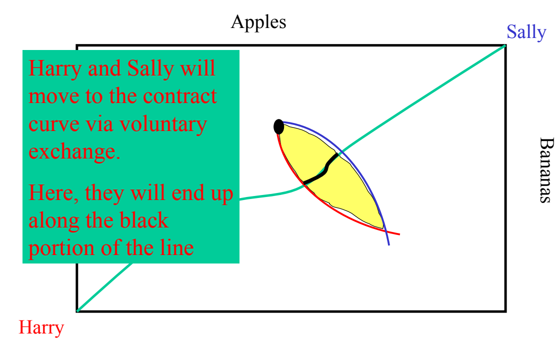

Pareto Optimality

- When they are on the contract curve, we say that they have achieved Pareto Optimality, the economist's equivalent of "bliss".

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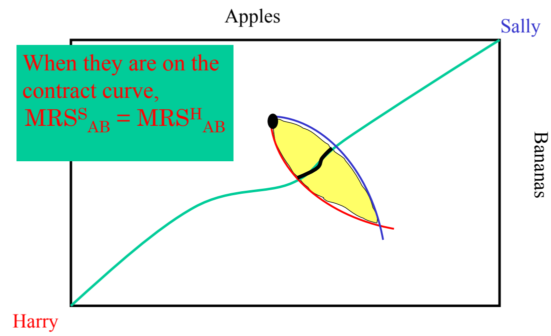
Pareto Optimality

- When they are on the contract curve, we say that they have achieved Pareto Optimality, the economist's equivalent of "bliss".
- It is impossible to make Harry better off without making Sally worse off (or vice versa)
- If they are not on the contract curve, it is possible to make one or both better off without making the other worse off.

Marginal Rates of Substitution



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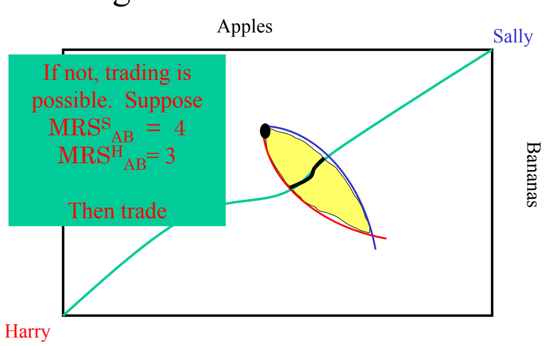

Two Qualifications

- Consumer Sovereignty

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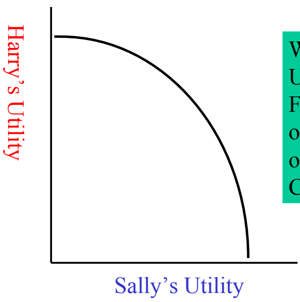
  - Are we comfortable with welfare checks being spend on drugs and alcohol?
  - Do we think children know what is best for them?

Two Qualifications

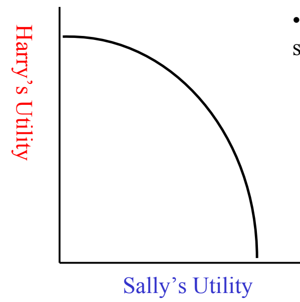
- Consumer Sovereignty
- Do we have anything to say about the right point on the contract curve?

The Utility Possibility Frontier



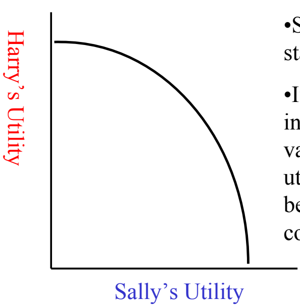
We construct the Utility Possibility Frontier by reading off the different levels of utility from the Contract Curve

The Utility Possibility Frontier



- Simply another way of stating the contract curve

The Utility Possibility Frontier



- Simply another way of stating the contract curve
- If we had social indifference curves for the various combinations of utility, we could find the best point along the contract curve

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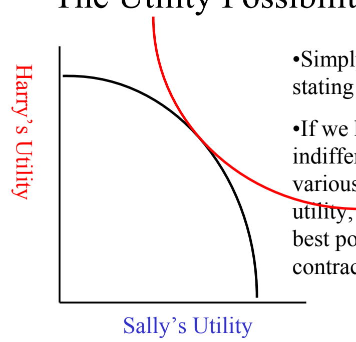
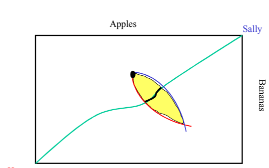


- Simply another way of stating the contract curve
- If we had social indifference curves for the various combinations of utility, we could find the best point along the contract curve

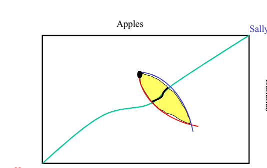
The Core

- The yellow area is the **core.**



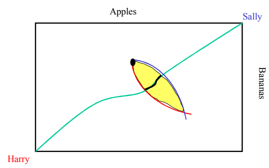
The Core

- The yellow area is the core.
- If only Harry and Sally are involved, they will sit down and simply haggle with each other.



The Core

- The yellow area is the core.
- If only Harry and Sally are involved, they will sit down and simply haggle with each other.
- Suppose there are hundreds of Harry's and Sallies?



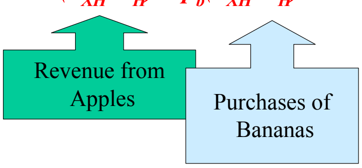
Markets

- The normal laws of supply and demand will get us to this point.
- Suppose that Harry and Sally start out with apples and bananas given by (a_{XH},b_{XH}) and (a_{XS},b_{XS}) respectively.
- We tell Harry that he can buy and sell apples and bananas at prices $(1,p_b)$. The only constraint is that

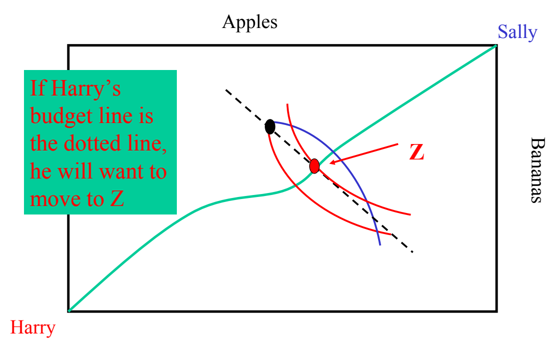
$$(a_{XH}-a_H)+p_b(b_{XH}-b_H)=0$$

Markets

$$(a_{XH}-a_H)+p_b(b_{XH}-b_H)=0$$



The Contract Curve



Markets

- If Sally is told that she can buy and sell apples and bananas subject to a budget constraint

$$(a_{XS}-a_S)+p_b(b_{XS}-b_S)=0$$

she will be willing to buy and sell.

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- **However** the price that persuaded Harry to move to Z, might or might not move her to Z.

The Fundamental Theorem

- **For any starting point there is a price p_b which will lead both Harry and Sally to move to the same point on the contract curve.**

The Fundamental Theorem

- **For any starting point there is a price p_b which will lead both Harry and Sally to move to the same point on the contract curve.**
- **That is, there is a price that equates supply and demand. It puts Harry and Sally on the contract curve**

Summary

- Normal trading gets Pareto Optimality in distribution.

MRS(Harry) = MRS(Sally)

- More to Come

End