

Chapter 2

Production Possibilities



The Production Possibilities Frontier

- The **production possibilities frontier, PPF**, is a graph that shows the combinations of output that the economy can possibly produce given the available factors of production and the available production technology.
- It shows the **best an economy can do if it uses all its resources efficiently, given the current technology**.
- NOTE: the PPF is often called a production possibilities boundary, PPB.

Example: Macland

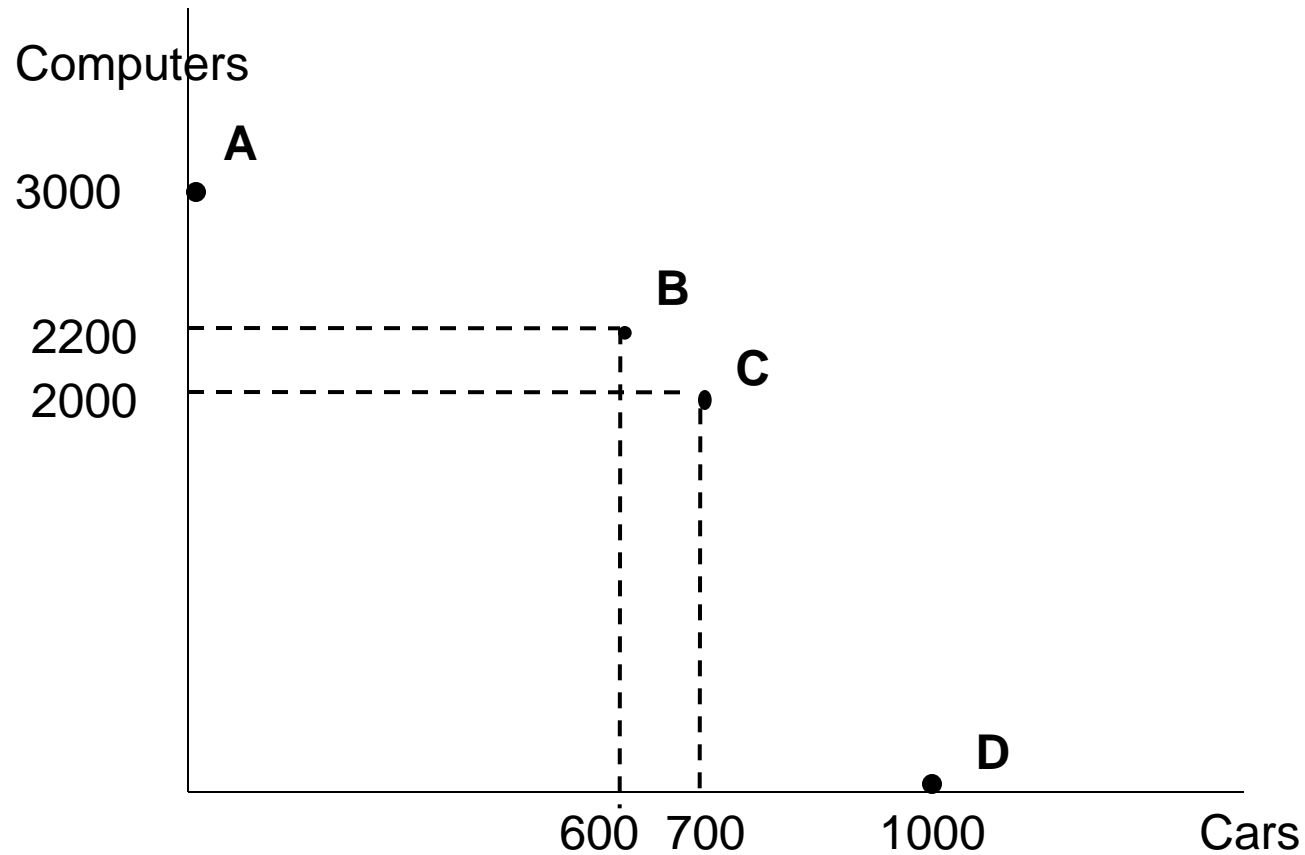
- Consider the economy of Macland. It produces only 2 goods: computers and cars.
- Macland's technology is given (it is what it is).
- Its resources are fixed.
- The following table shows combinations of computers and cars Macland can produce if it uses all its resources, given the current technology:

	COMPUTERS	and	CARS
A	3000		0
B	2200		600
C	2000		700
D	0		1000

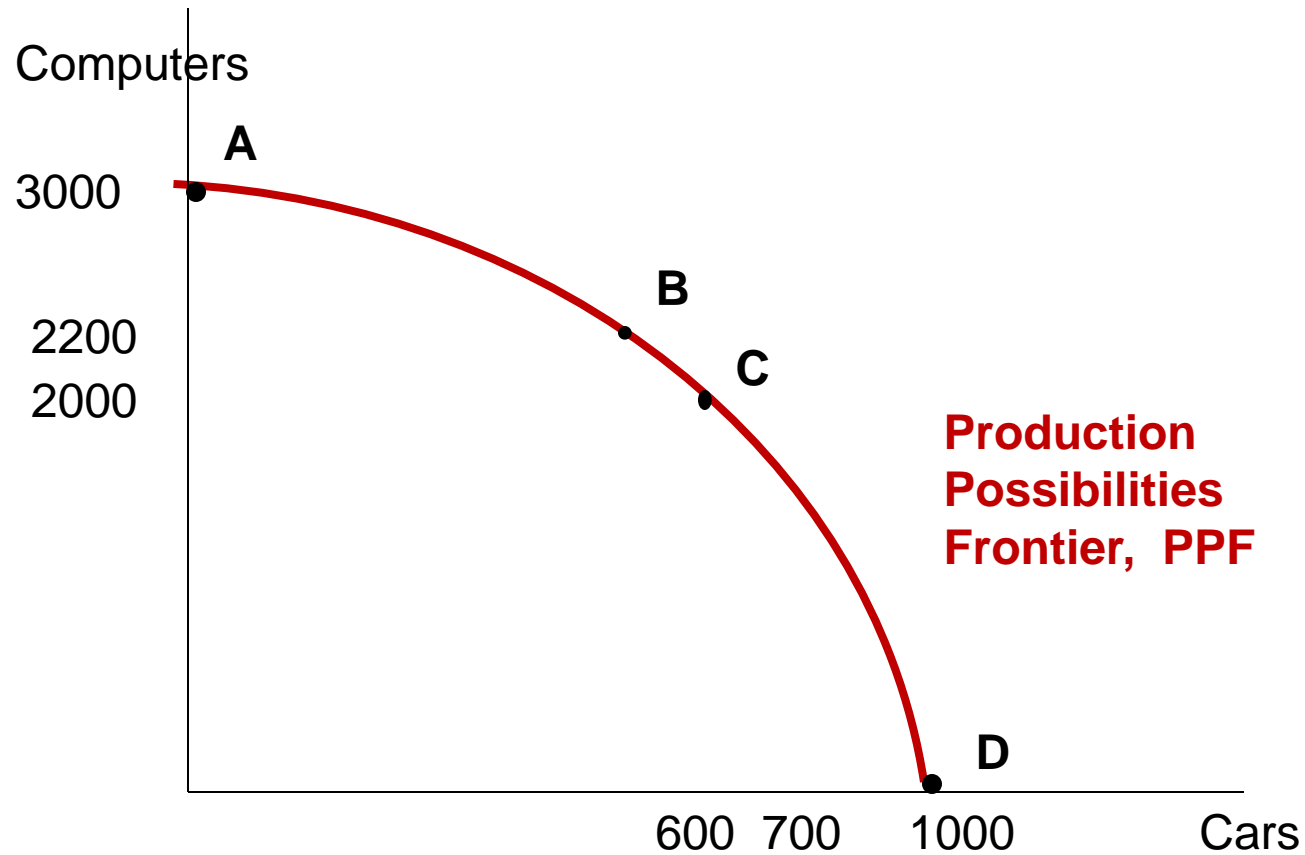
Note that this is only a partial table.

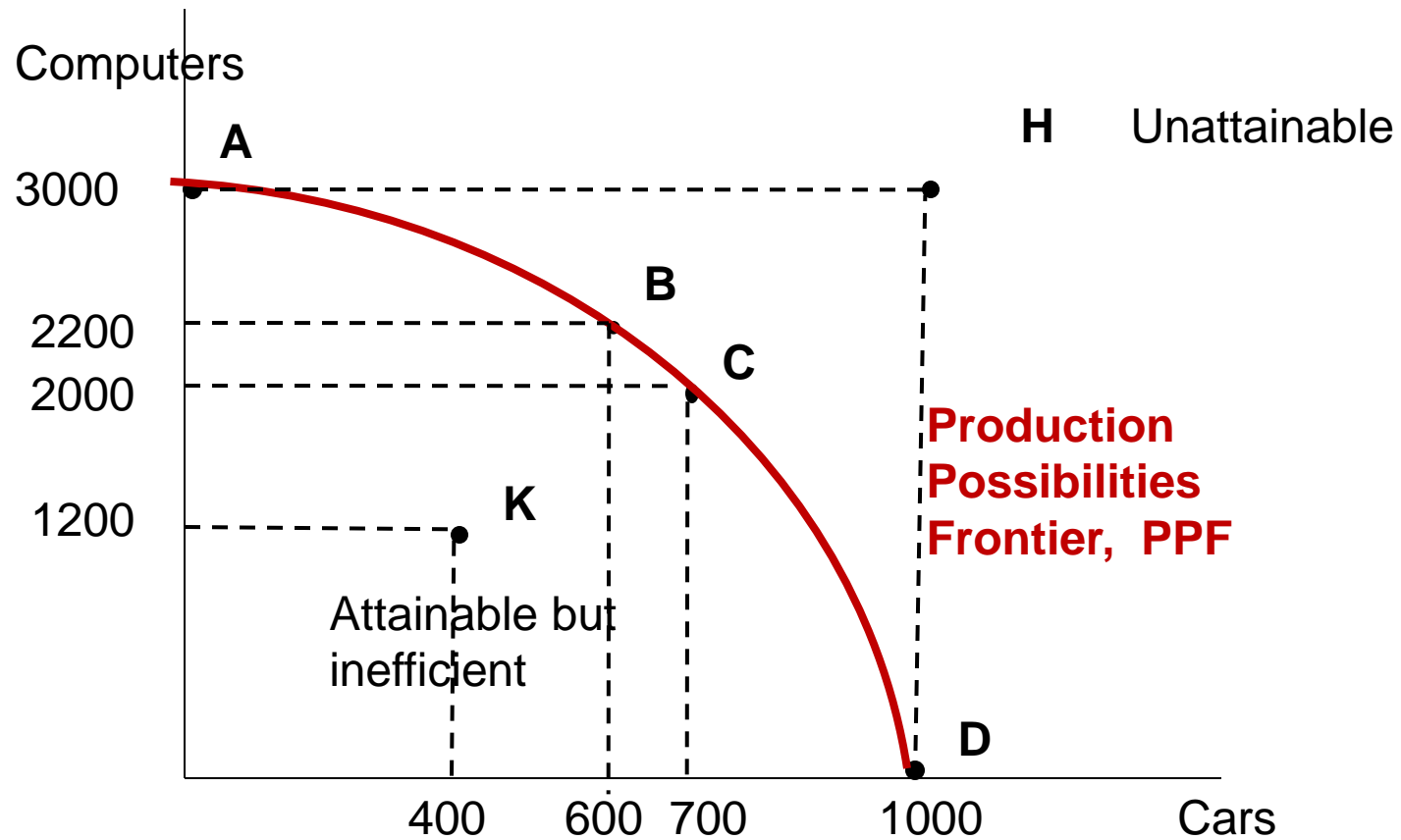
Let's graph these combinations:

PPF for Macland



PPF for Macland





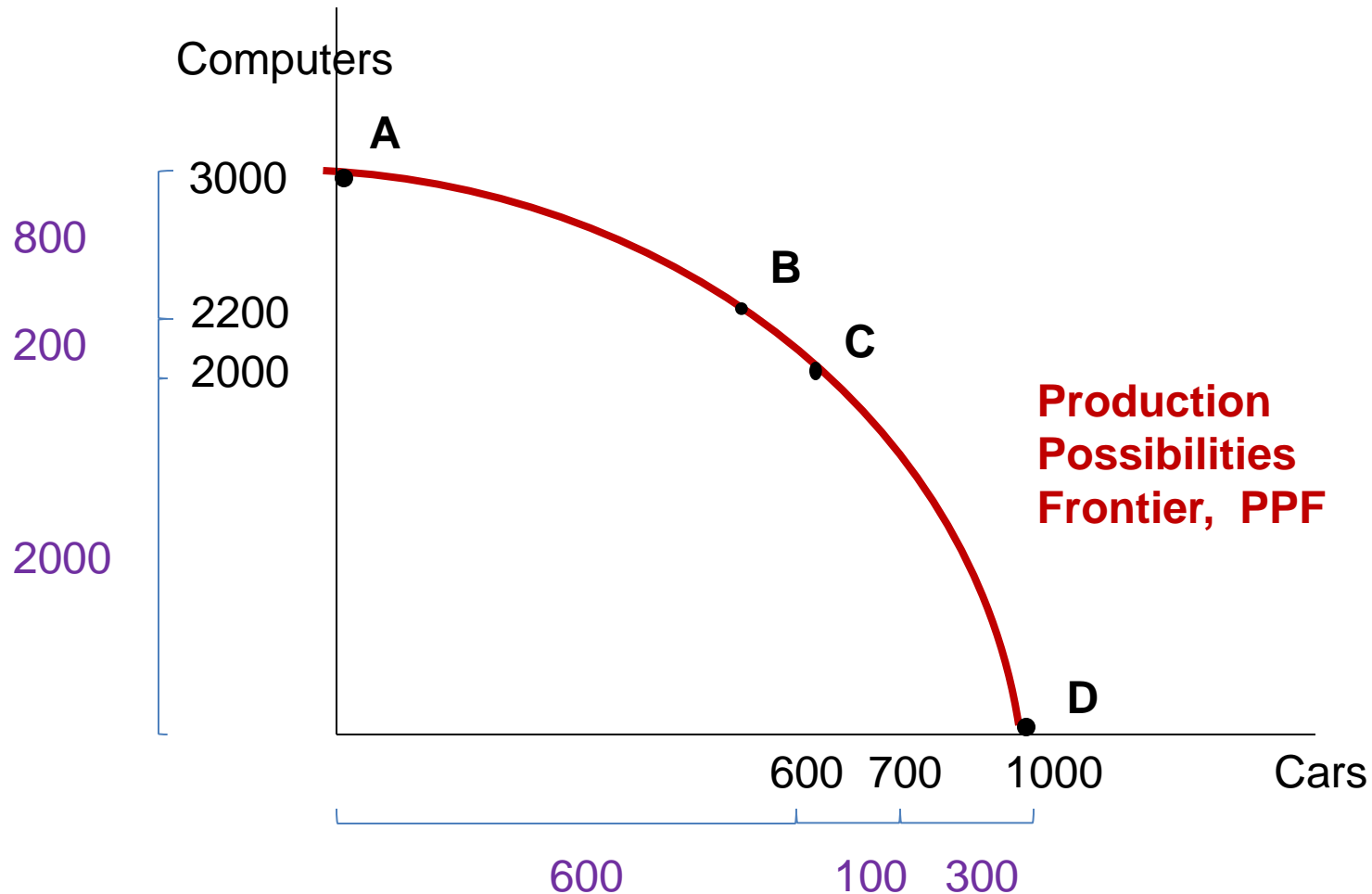
- Points A, B, C and D on the diagram are productively efficient – to produce these combos all resources are used, given the technology.
- Point H lies outside the PPF – it is unattainable. There are not enough resources to produce that combo of goods, or the technology is not good enough or possibly both.

- Point K lies inside the PPF. Macland can produce that combo, but it can produce more of one or the other or both, given the technology and available resources.
- Point K is feasible, but not efficient.

- Every point on the PPF is productively efficient.
- However, you could be on the PPF but producing a combination of goods that society doesn't want – i.e., the wrong combination.
- You would be producing at a point that is socially inefficient.
- Efficiency, then, includes productive efficiency (on the PPF) and social efficiency (producing the combo of goods that society wants).

- Every choice along the PPF involves a trade-off.
- We have to give up some computers to get more cars and vice versa.
- The PPF illustrates opportunity costs – how much we have to give up of one good to get more of the other.

PPF for Macland



- To move from 0 cars to 600 cars:

To get 600 cars, give up 800 computers

To get 1 car, give up $800/600 = 1.33$
computers

The opportunity cost of a car = 1.33 computers.

- To move from 600 cars to 700 cars:

To get 100 cars, give up 200 computers

To get 1 car, give up $200/100 = 2$
computers

The opportunity cost of a car = 2 computers

- To move from 700 cars to 1000 cars:

To get 300 cars, give up 2000 computers

To get 1 car, give up $2000/300 = 6.67$
computers

The opportunity cost of a car = 6.67 computers.

- We can easily calculate the opportunity cost of a computer along the PPF.
- It is the inverse of the opportunity cost of a car moving between the same points on the PPF.
- The opportunity cost of a computer = $1/(\text{opportunity cost of a car})$.

- For example, to move from 2000 computers to 2200 computers:

To get 200 computers, give up 100 cars

To get 1 computer, give up $100/200 = .5$
cars

The opportunity cost of a computer = .5 cars

This is exactly $1/(\text{opp.cost of a car}) = 1/2 = .5$

- Notice that as we move down the PPF, the opportunity cost of a car increases.
- This explains why the PPF is bowed out – increasing opportunity costs.
- In fact, the $|\text{slope of the PPF}|$ is the opportunity cost of a car at any point along the PPF.
- In general, for any 2 goods X and Y (X is on the horizontal axis), $\text{the } |\text{slope of PPF}| = \text{opportunity cost of X}.$

- Why do opportunity costs increase as we produce more of a good?
- We're moving resources from the computer sector which were really good at making computers to the car sector where they aren't as good.

- It is also possible that opportunity costs are constant.
- An economy always gives up the same amount of one good for more of another at the same rate.
- For example, you always give up 50 bushels of wheat to produce 10 tonnes of carrots.
- If opportunity costs are constant, the PPF will be linear.

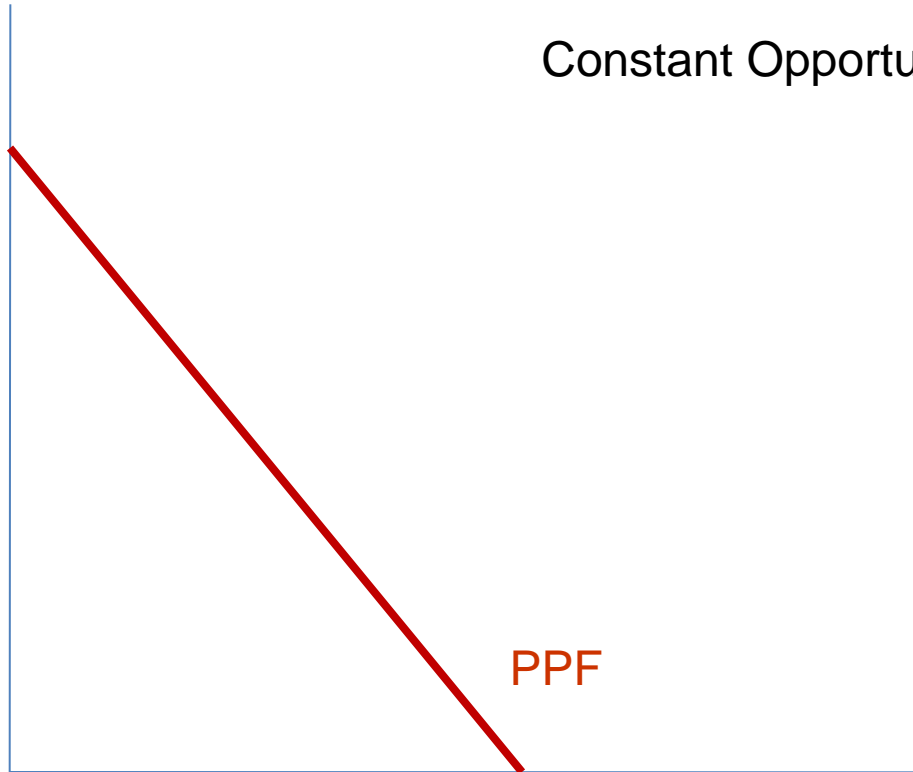
wheat
Good Y

Constant Opportunity Costs

PPF

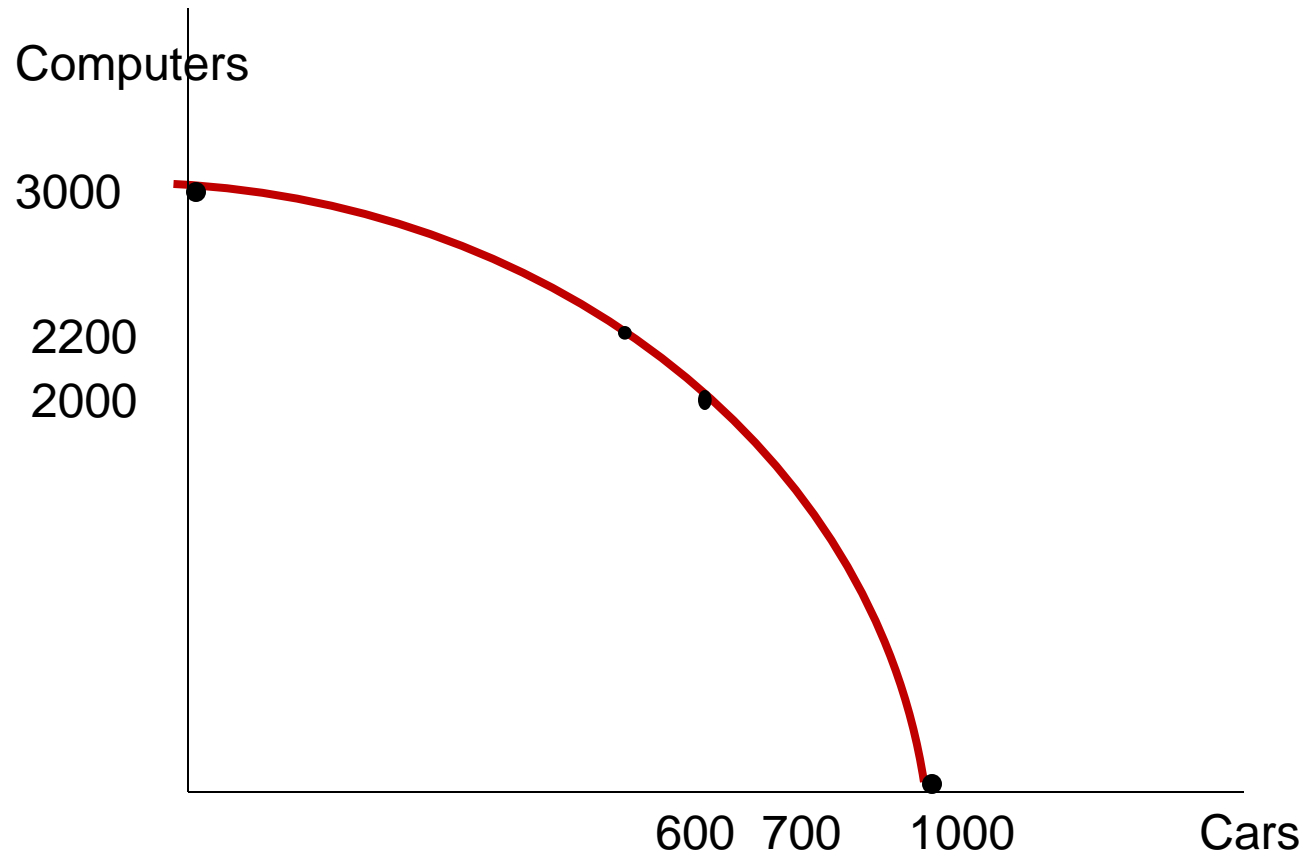
Good X

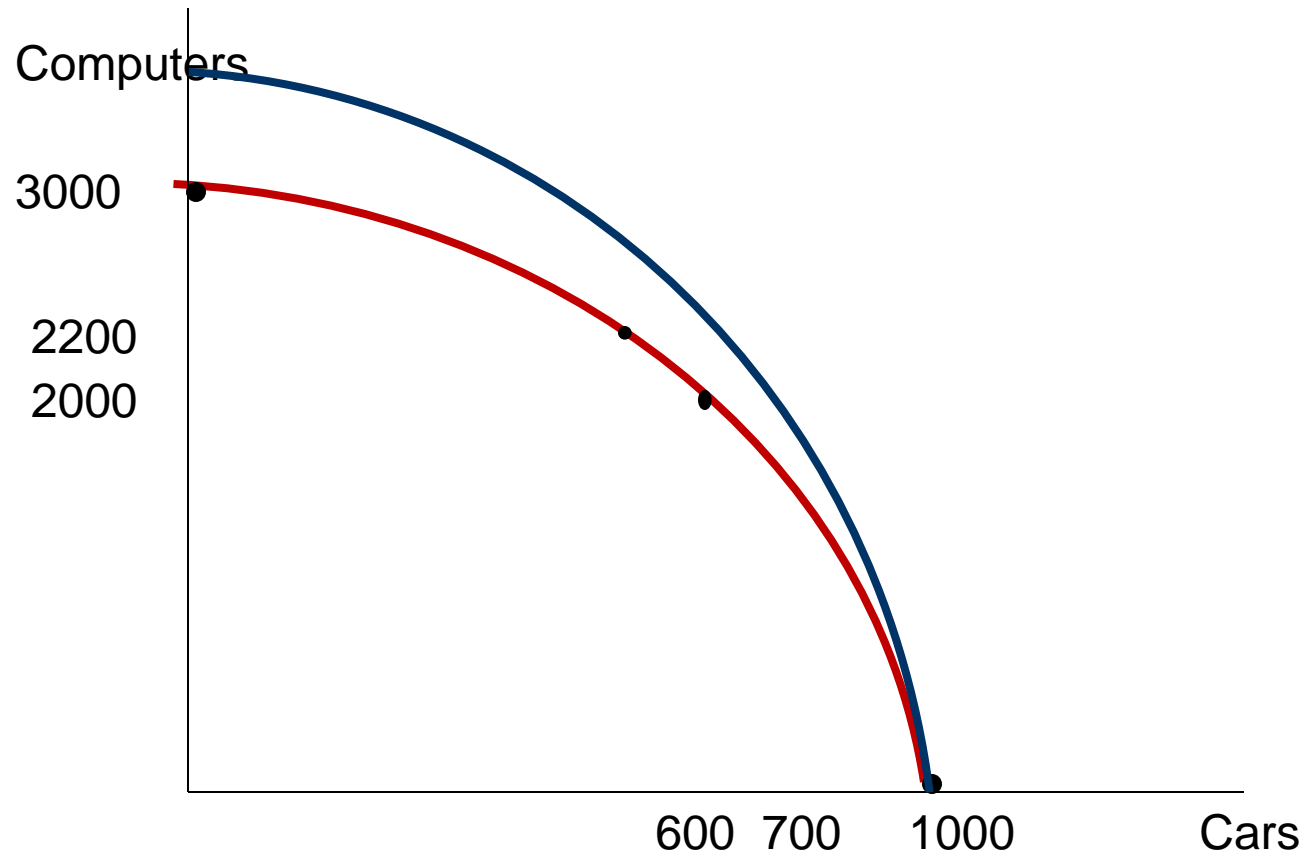
carrots



Shifts in the PPF

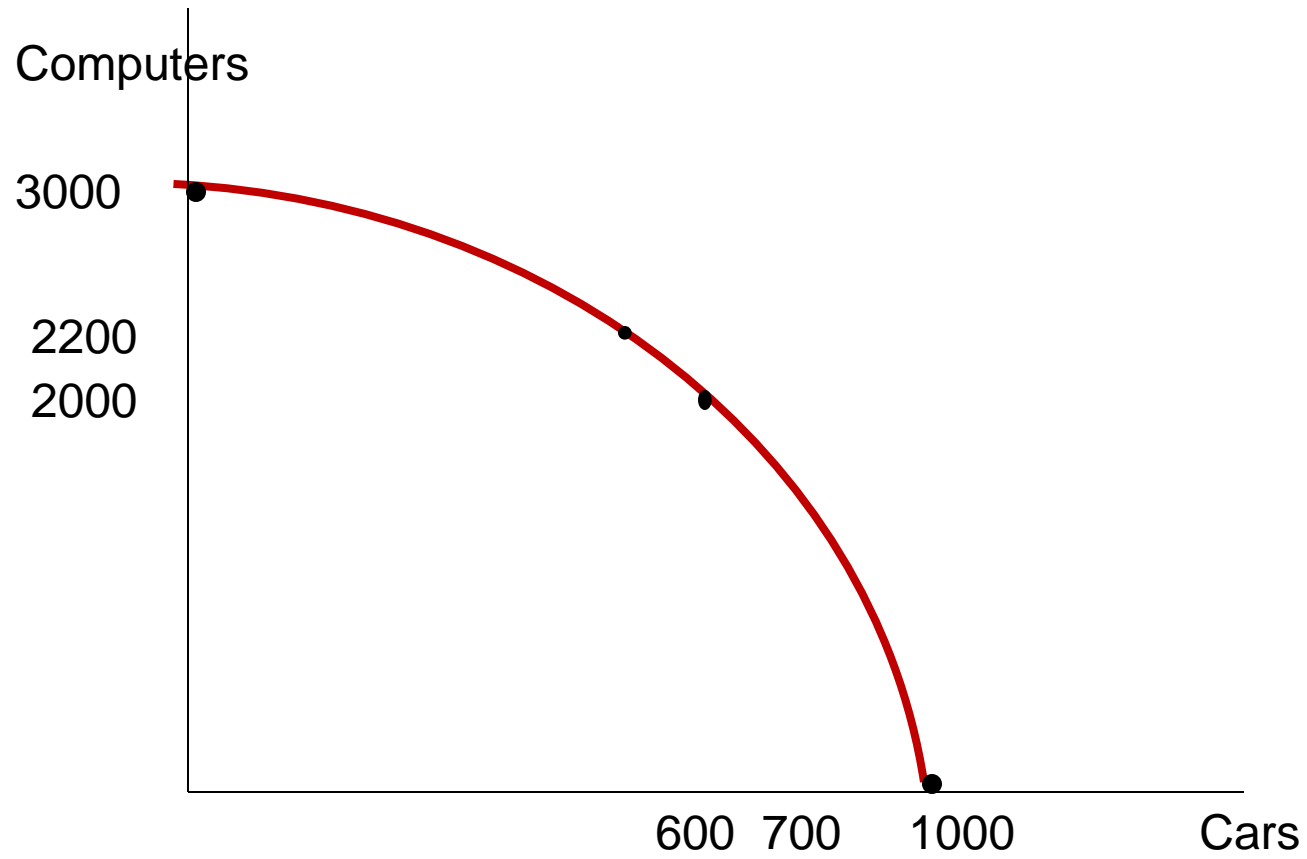
- Any changes to the amount of available resources, their productivity or changes to the available technology will shift the PPF.
- Economic growth shifts the PPF to the right.
- For example, an improved technology only for computer production becomes available:

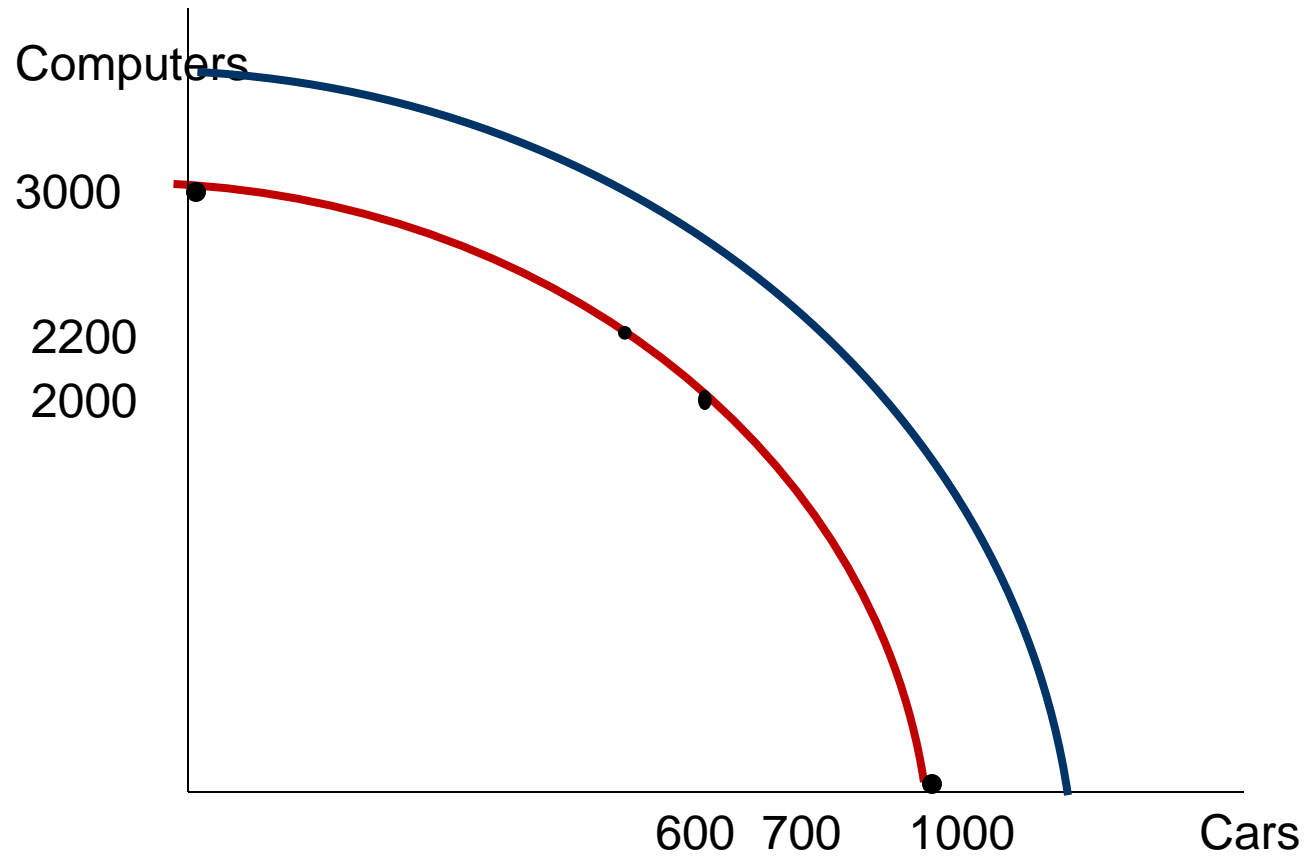




Another example:

- The labour force increases in both sectors and is equally productive: shifts the entire PPF out (right)





- A rubber shortage that doesn't affect computers means fewer tires and other rubber car parts which means fewer cars can be produced: rotates the PPF in (towards the origin) so that fewer cars can be produced, but no change in the quantity of computers.

