PRODUCTION POSSIBILITIES

We discussed questions for any society and what tradeoffs an economy faces. This chapter provides an economic model of tradeoffs: PRODUCTION POSSIBILITIES

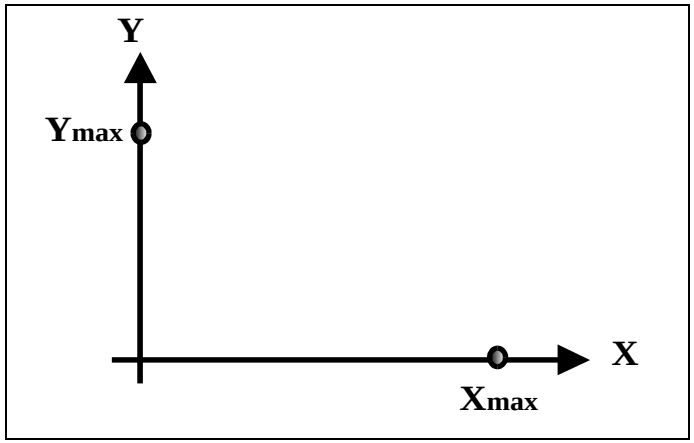
- ECONOMIC MODEL: simplified way of explaining a topic of interest, focusing only on most important elements (an abstraction)
  -Uses definitions and simplifying assumptions to derive testable hypotheses

<u>Definitions Used:</u>

- PRODUCTION POSSIBILITIES: maximum outputs attainable to a society
- SHORT-RUN: time period where the stock of (physical) capital is constant

<u>Simplifying Assumptions:</u>

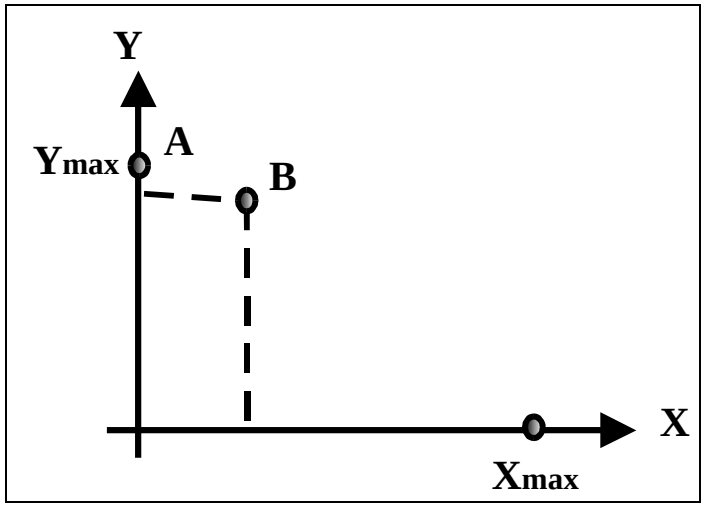
1. Two goods: X and Y (makes graphing easier)
2. Fixed resource endowment, fixed technology
3. Inputs can be used to produce both X or Y
4. No impediments to resource movements
5. Full employment and efficient production



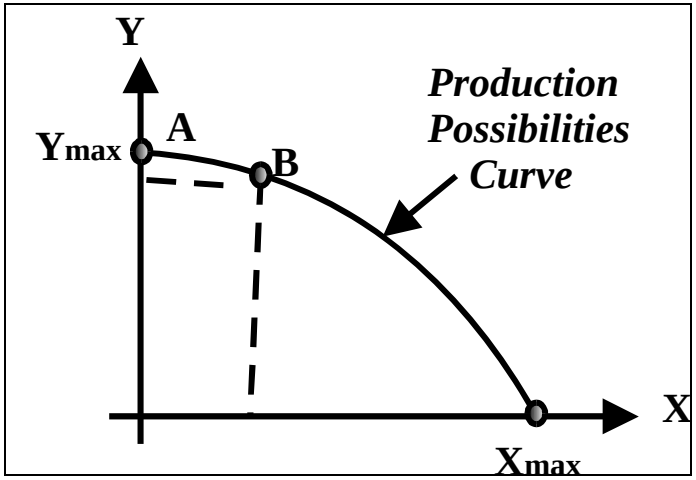
Start with all inputs used to make Y, get Y_{max}

If put all inputs into X get X_{max}

Realistically, want some of both goods.



Start at Y_{max}, to get some of X: take inputs from Y, which reduces the output of Y -move inputs to X, which creates X output. Results in a point like B Continue to move inputs from Y to X, until reach X_{max}, and a set of points emerges

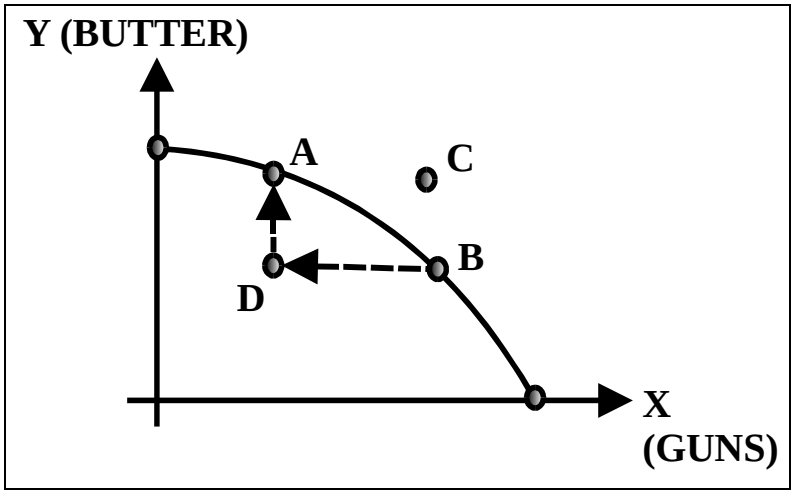


Connect all the X,Y points, get Production Possibilities Curve, which shows *maximum* outputs attainable, given the resource endowment and technology (short-run)

- To gain X, must give up some Y in the short-run - a TRADEOFF exists. This is the opportunity cost, or cost of X
- Absent international trade, production possibilities define consumption possibilities
- This curve is CONCAVE FROM THE ORIGIN, *not* a straight line. This reflects the fact that opportunity cost INCREASES in the short-run. Why? Inputs are *not* equally suited to producing both X and Y (ex: land better suited to agriculture than manufacturing)
- Law of **INCREASING OPPORTUNITY COST**

Exercise: show that if keep increasing X output by equal amounts, Y falls by larger amounts

APPLICATION:
DEFENSE BUILD-UP IN 1980s
Tradeoff exists between military uses of resources **(GUNS)** and non-military uses **(BUTTER)**
-If want a larger military sector but no less of other things, NOT FEASIBLE in short-run (point C)



To get more Guns, *must give up some Butter*

Tradeoff: move from A to B (less non-military) - implies opportunity cost

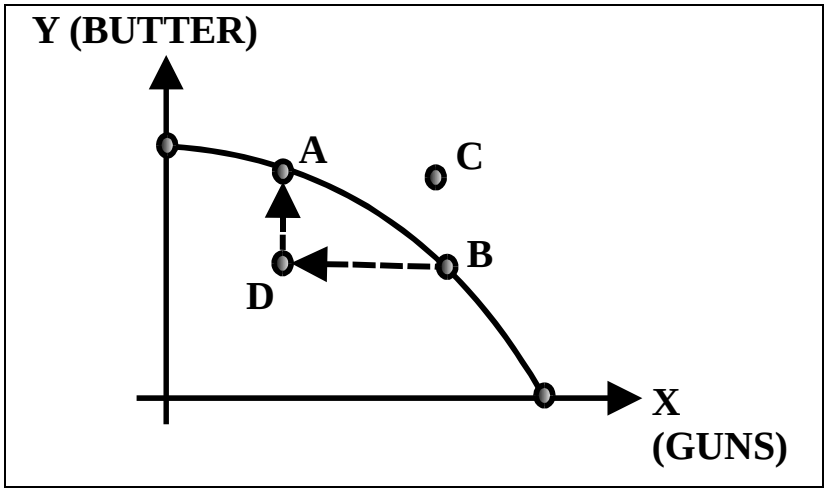
In 1980s, large # engineers in defense-related jobs

- affected US consumer goods - *less competitive internationally*
- in attempt to get to point C, US had large rise in defense spending causing Government Deficits and doubling of National Debt
- Cold war ended in 1989, making large expenditure unneeded
- 1990s: US lowered the size of its military establishment, couldn't afford the $$ involved

DEFENSE CUTBACKS of 1990s:

- less weapons production
- base closings
- fewer weapons developed

CAUSED IN REDUCED OUTPUT, UNEMPLOYMENT, SKILL MISMATCHES, LESS SPENDING AND SLOWER ECONOMIC GROWTH



THE CUTBACK OF MILITARY PRODUCTION *DID NOT* MEAN MOVING FROM B TO A WHILE REMAINING ON THE PPC

- Due to unemployment and lower production, we initially moved from B to D - *inside curve*. Ultimately, moved from D to A back on curve, but this took SEVERAL YEARS

Led to notion of DEFENSE CONVERSION: have defense contractors shift production to consumer goods

- A logical sounding "pipe dream"

Saw that the defense build-up of 1980's increased deficits and national debt:

BUDGET DEFICIT: amount government spending exceeds tax revenue in a given year
NATIONAL DEBT: total of past deficits

- must be financed to continue
- interest on debt - fastest rising part of government spending

To pay for deficits, government must finance these and the national debt - generally by selling BONDS
HOW DOES THIS AFFECT THE ECONOMY *IN THE FUTURE*?

1. $ to pay national debt could have been used for other purposes
2. size and vitality of PRIVATE Sector affected
3. INTEREST RATES: as government competes with companies and persons for loanable funds, interest rates are higher than would otherwise be

Q: How does this affect Production Possibilities?
A: By altering the rate of economic growth

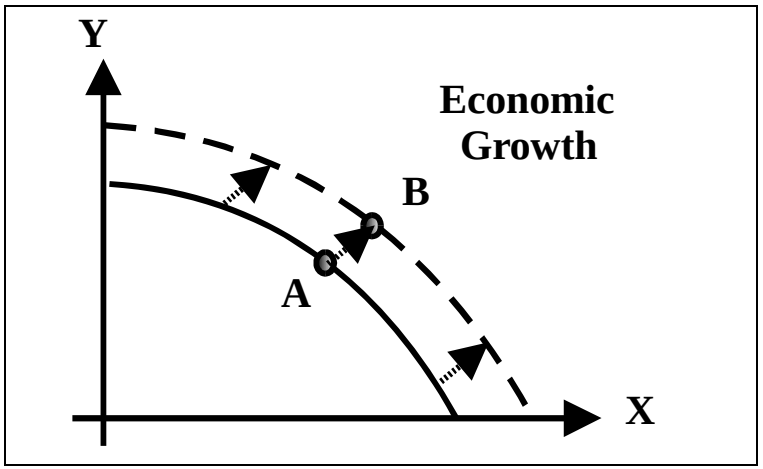
Recall: points *beyond* PPC not attainable in short-run. Can be reached if alter model assumptions

- need larger resource base, and/or
- improved technology

** **THE LONG RUN** **

- Causes OUTWARD SHIFITING OF PPC

****ECONOMIC GROWTH****



Now can produce and consume more than was possible before

LARGER RESOURCE BASE

LABOR: in US - slow population growth, approaching **Z**ero **P**opulation **G**rowth (ZPG)
- immigration - one way to raise labor force

CAPITAL: *real* capital (factories/equipment)
CAPITAL STOCK: amount in existence at a time
- this changes through time with **INVESTMENT**
INVESTMENT: spending on factories/equipment

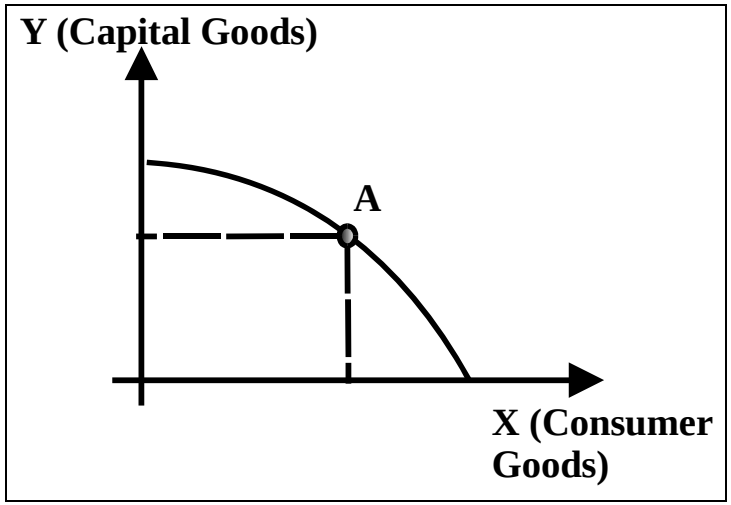
Factors to Consider:
- Capital depreciates (deterioration/obsolescence)
- **GROSS INVESTMENT**, total spending on factories/equipment, *must exceed depreciation* for the capital stock to increase. This indicates positive **NET INVESTMENT** (excess of gross investment over depreciation)

I_{net} = f(interest rates, expected profit, taxes, ...)

Investment - most volatile component of total spending (since depends on expectations)
- **CYCLICAL VARIABLE**

To see what is involved with growth:
Capital Goods => Investment => Future Consump.
Consumer Goods => Current Consumption

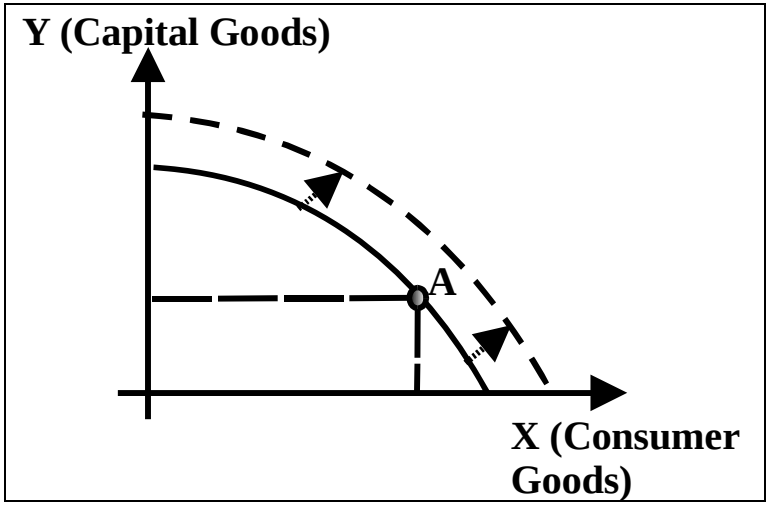
choice of resources devoted to capital and consumer goods determines economic growth
- more capital goods, greater growth, more *future* consumption
-more consumer goods, less growth, less future consumption



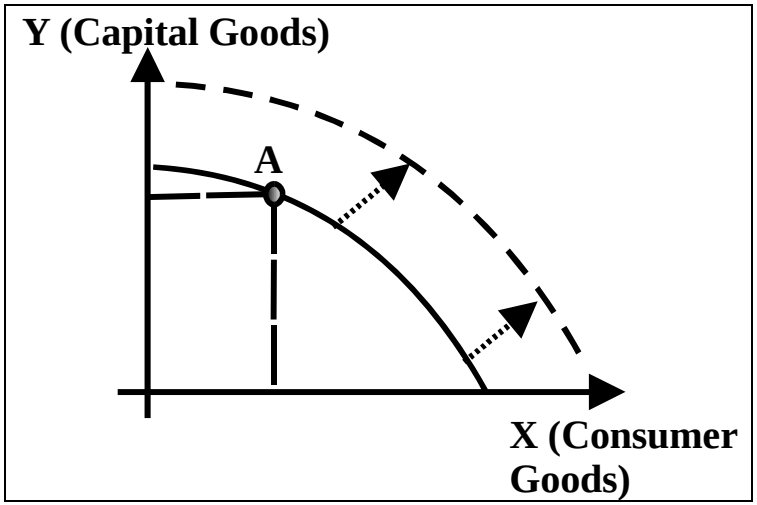
Current point will determine rate of economic growth (shift in curve)

Short-run tradeoff: to increase future consumption, resources devoted to capital goods must rise, which requires less consumption goods (current cons)

The closer the chosen point is to capital axis, the greater will be the rate of economic growth



Little Capital Goods -slow growth



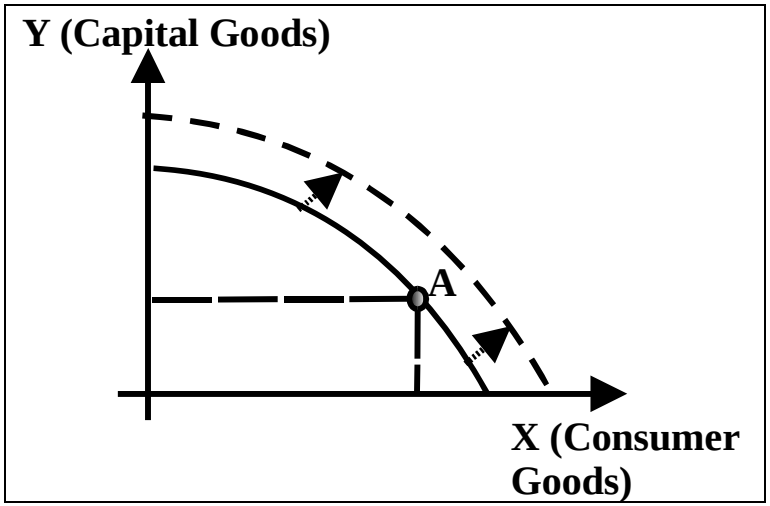
Much Capital Goods -rapid growth

<u>What are the effects of deficits on economic growth?</u>

- Bond financing of deficits raises interest rates as government competes with others for available funds - this lowers I_{net}
- Less investment results in a *smaller future capital stock*
- A smaller capital stock results in less future economic growth than would have occurred (smaller PPC shift) and
- More debt on future generations (intergenerational considerations)

<u>WORKINGS OF DEFICITS:</u>

- With income taxes, as the economy grows faster, is more income to tax, so TAX REVENUE AUTOMATICALLY RISES, lowering deficit
- If the economy slows, tax revenue automatically falls, raising the deficit (or lowering surplus)
- Are different types of deficits : "Best" is investment oriented (ex: bridges, infrastructure) that *enhances future production possibilities*. "Worst" is consumption oriented - largely for current consumption, little by way investment - hurts future economic growth



Effect of "Worst" type of deficits -slower growth

How does economic growth affect the budget?
The *size* of the economy (PPC curve) determines the amount of tax revenue our ability to afford different types of spending programs

Growth ⇒ Larger Economy ⇒ Higher Income
AND
Higher Income ⇒ More Tax Revenue

FISCAL DIVIDEND – the increase in tax revenue resulting from economic growth

Rapidly growing economies (nations or states) can afford more programs thru fiscal dividend
Ex: Prescription drugs for senior citizens
Ability to eliminate taxes (and afford it)
Various social programs (health, education)

RHODY'S BELIEVE IT OR NOT:
Rhode Island – taxes autos at local property tax rates – the auto excise tax

- ⇨ very expensive to own cars in cities like Providence and Pawtucket
- ⇨ is *regressive* in nature – tax is larger percentage of income for lower income persons – unfair

RI wanted to phase out this tax. BUT:

- after 7 years, it would cost about $200 million in *direct* costs only
- largest surplus in the last recovery was about $100 million

We couldn't afford this phase-out because of slow (lagging) economic growth in RI and too little fiscal dividend

WHAT NOT TO DO (i.e., see fiscal policy, Rhode Island)

- this phase-out put money into citizens pockets, which is *consumption oriented*
- the *indirect* cost is the loss of economic growth (and fiscal dividend) by not using this money to finance public education which is *investment* oriented – this must be added to the direct cost ($250 million)

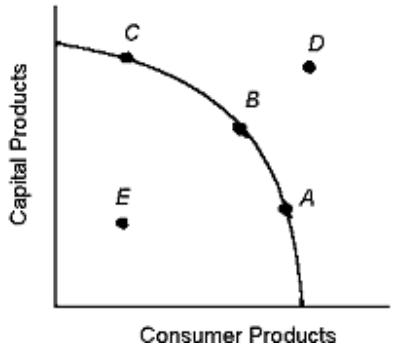
- This treats a symptom (high tax rates on cars) not the problem (why are tax rates high)
- Is a short-term fix not a long-term solution
- It emphasizes consumption over investment spending ⇒ slower growth and less future income and fiscal dividend
- Since the DEPCO debt was paid off, state government intended to take those proceeds (0.6% of the 7.0% sales tax, about $50 mil/year) to finance the phase-out
- These funds would go into "The General Fund" (the "Giant Sucking Sound" for RI – Perot's phrase)

WHAT TO DO (My proposal in 1998)
http://members.home.net/lardaro/useexcess.htm

- Take the 0.6% of the sales tax revenue once DEPCO debt was paid and earmark it for the financing of public education every year
- NEWS FLASH FOR LEGISLATURE: Public education is NOT K – 12, but K – Ph.D., it includes higher education!!
- This *automatically* links consumption (spending on retail goods) with investment (in education)
- This will increase growth, income, and fiscal dividend so maybe some day we will be able to afford the auto excise tax phase-out

Example: buy a $20,000 auto and $120 of the sales tax revenue goes to financing public education – beats the hell out of cake sales!!

Practice Questions:



1. In the figure above, which of the following points would the economy choose to enhance *future* production (that is, which point would be best for investment purposes)?
   A) *A* B) *B* C) *C* D) *D* E) *E*

2. Point *D* in the figure above represents:
   A) a combination of consumer and capital products that may be obtainable sometime in the future but is impossible to produce now.
   B) full employment.
   C) a combination that can be produced only if resources are fully and efficiently employed.
   D) an inefficient use of resources.

3. During the Persian Gulf War many of Kuwait's oil refineries were destroyed. This is best be represented by
   A) a movement down its production possibility frontier.
   B) a movement off its production possibility frontier to some point inside the frontier.
   C) a shift of its production possibility frontier back and to the left.
   D) a movement up its production possibility frontier.

4. Which will cause an inward shift of a PPC?
   A) An increase in the working-age population.
   B) A decrease in the amount of resource employment.
   C) A decrease in the availability of natural resources.
   D) An increase in the amount of capital available.
   E) An increase in unemployment.