

Lecture 13(iii)

Announcements

Next week there is a debate in sections about Immigration.

To prepare, go to the web link on immigration at week 14 at Canvas.

Lecture

0. Updating deterrence game
- 1 Demand for factors of production (derived demand for labor)
2. Combine with labor supply
3. Start Immigration

Relabel games from last class

Before credible commitment to retaliation

		Soviet Union	
		First Strike	Don't Attack
U.S.	First Strike	USSR gets -100 U.S. gets -100	USSR. gets -1000 US. gets 200
	Don't Attack	USSR gets 200 U.S. gets -1000	USSR gets 0 U.S. gets 0

After credibly committing to massive retaliatory attack on warning. So if one party launches a first strike, nuclear winter results. The payoffs now look like: (where $-\infty$ means “minus infinity”)

		Soviet Union	
		First Strike	Don't Attack
U.S.	First Strike	USSR gets $-\infty$ U.S. gets $-\infty$	USSR gets $-\infty$ US. gets $-\infty$
	Don't Attack	USSR gets $-\infty$ U.S. gets $-\infty$	USSR gets 0 U.S. gets 0

Demand For Factors of Production (With a Focus on Labor)

So far:

- studied consumer demand (beer and pizza)
- firm supply
- Now look at demand for factors of production

Derived demand (firms don't want labor for own sake, want it to make a profit).

Technology of firm

Output prices

Input prices,

Put together and get labor demand

Technology given by

Production function

How output depends upon inputs.

Lawn Business:

2 workers for full day (8 hours)

1 truck

2 lawn mowers

1 edger

Suppose with this combination of inputs, output is **10 lawns mowed**

Add more inputs, have more output.

Suppose add another worker and can now mow 13 lawns.

Marginal Product of labor (MP) from 2 to 3 workers is

$$13 - 10 = 3 \text{ lawns.}$$

How much labor should the firm hire?

- Will depend upon the price of lawns.
 - Suppose price equal \$40 per lawn.
 - Value of the marginal product equals $P \times MP = \$40 \times 3 = \120 .
 - Should you hire the third worker?
- Will also depend upon the wage.

If wage $>$ \$120 a day,
then wage $>$ Value of MP

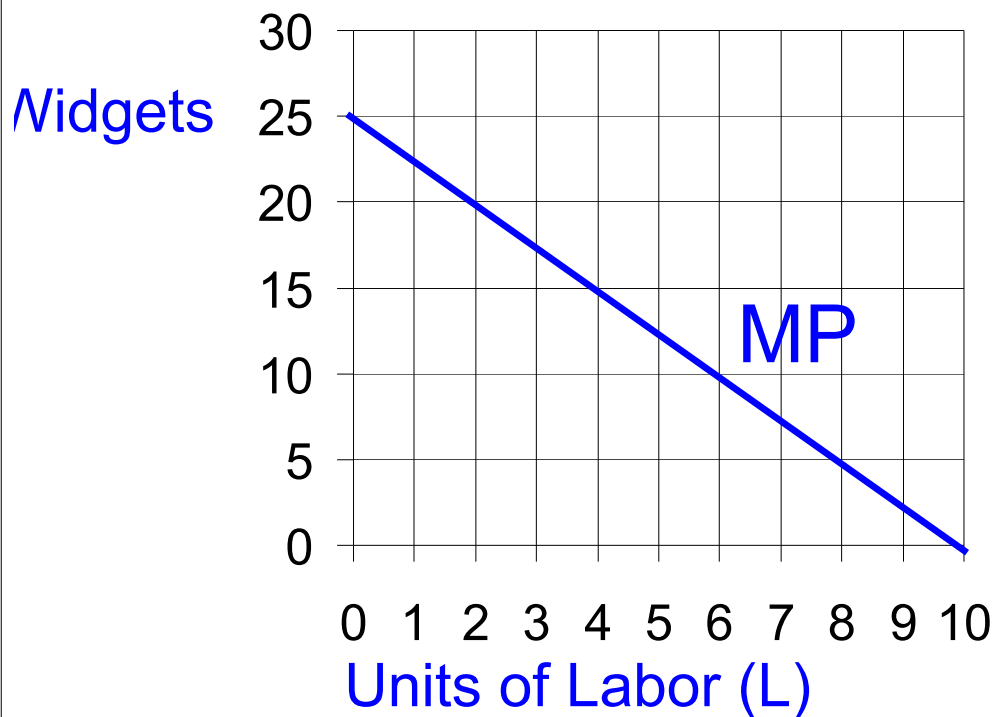
Bad idea

If wage $<$ \$120 day,
then wage $<$ Value of MP,

Good idea.

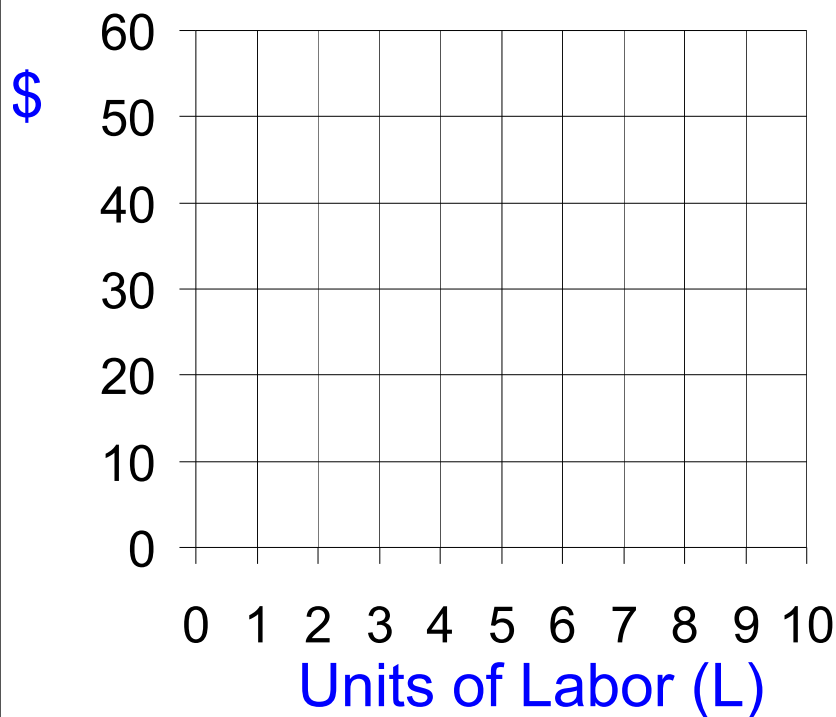
General Rule: pick labor where
wage = Value of MP

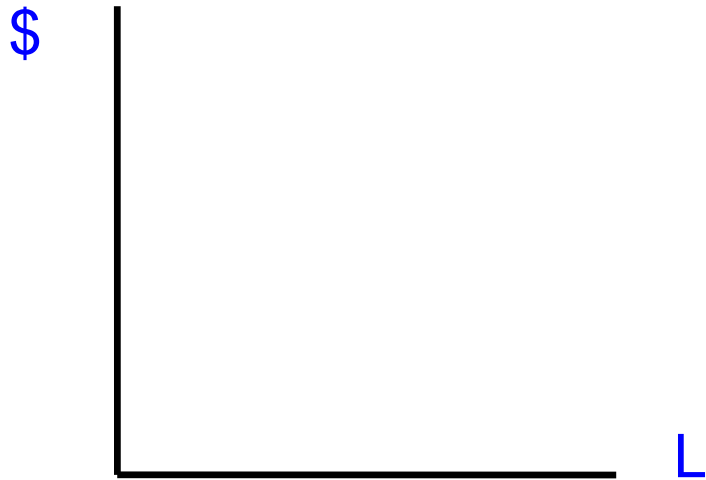
Example: Back to Econland.
Suppose the Marginal Product of
Labor for S1 looks like this:



Note: We have **diminishing marginal product**, MP is downward sloping.

Suppose Widget Price is \$2. What is
S1's derived demand for labor?
(What is the **Value of the MP?**)





What happens when wage changes?

Movement _____

What happens when output price changes? _____

(Let's go back and see what happens if $P=\$4$ for S1)

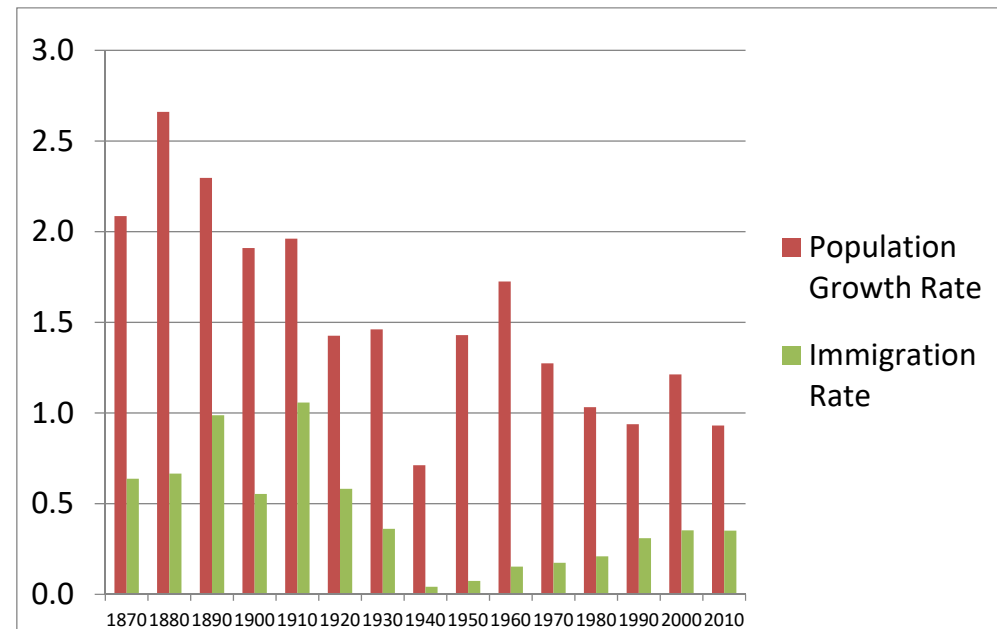
Add in **labor supply** to obtain equilibrium wage and quantity of labor



Now consider the market for professional athletes. What happens to the equilibrium wage when television advertising payments to the league increase?

Immigration

Historical Background: Population and Immigration Rates



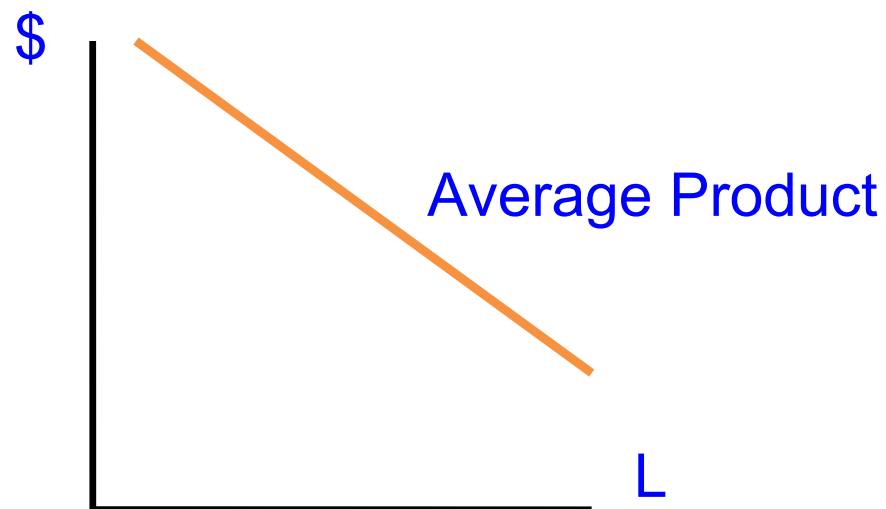
Start analysis with case where:
all workers have same skill.

Two extreme cases

Case 1 Agricultural economy
(subsistence farming)



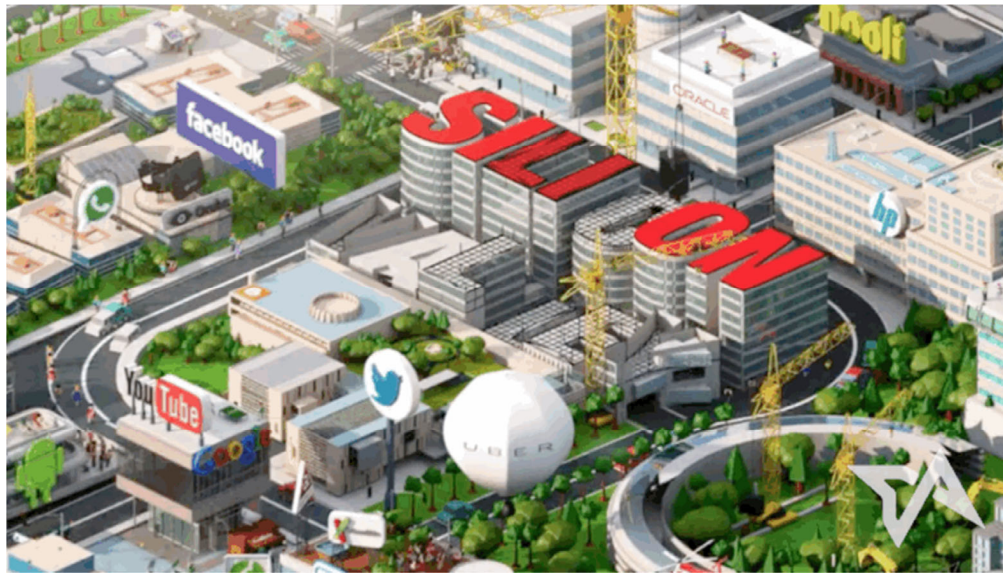
Plot average product as a function
of the population:



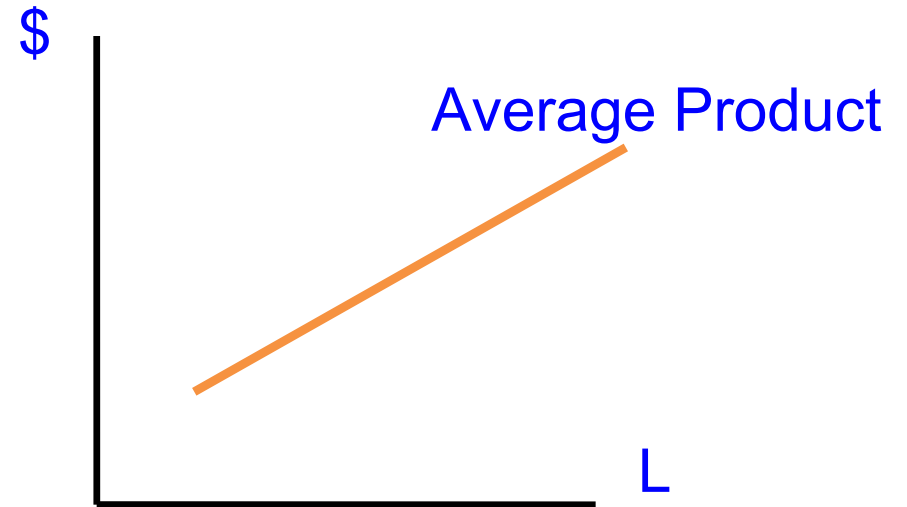
Fixed factor: Land
Run into diminishing returns

The theory underlying population
control strategies (e.g. China's one
child policy)

Case 2: Manufacturing or Innovation Economy (No fixed factor like land)



Plot average product as a function
of the population:



Case of increasing returns
Mechanisms:

- Scale economies
- Greater product variety
- Knowledge spillovers and information sharing (think Silicon Valley)

The theory explaining the existence of cities

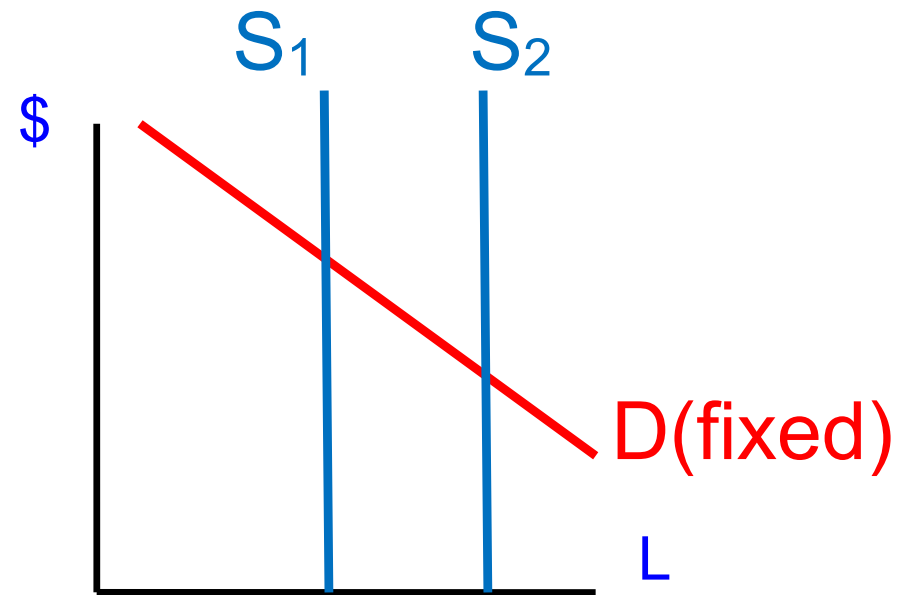
And why South Dakota is advertising to get people to move there.



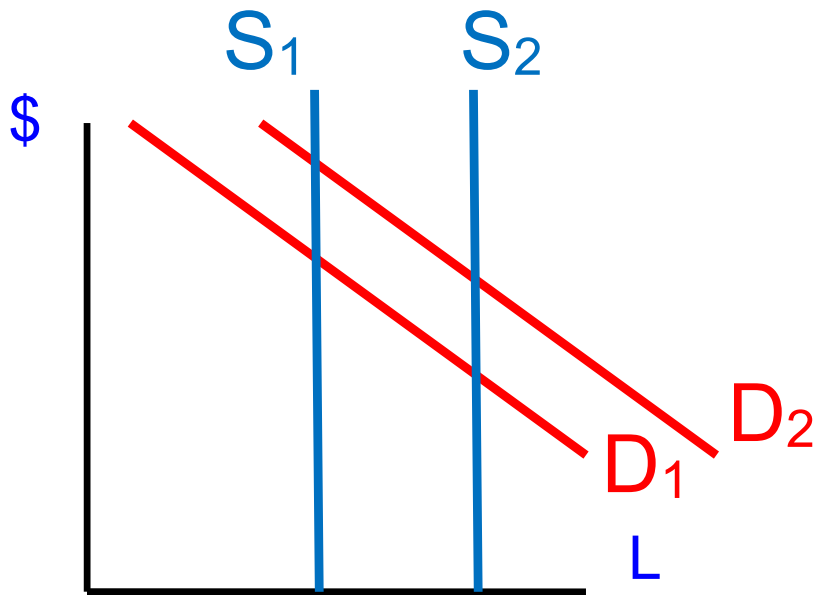
Watch clip

<https://youtu.be/HrX8OTFSFZI>

South Dakota is not thinking population inflows will do this:



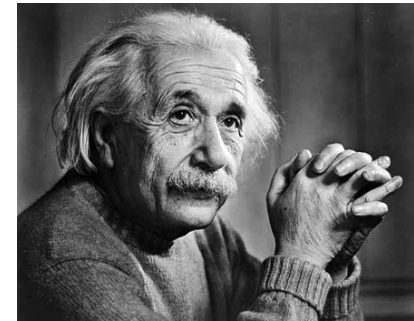
Rather, South Dakota thinking it looks like this or better:



Migrants increase the demand for labor (because they purchase things and can contribute to increasing returns)

So far have assumed migrants have the same skill. Now contrast **high skill versus low skill.**

Start with **high skill migrants**
Examples:
Albert Einstein

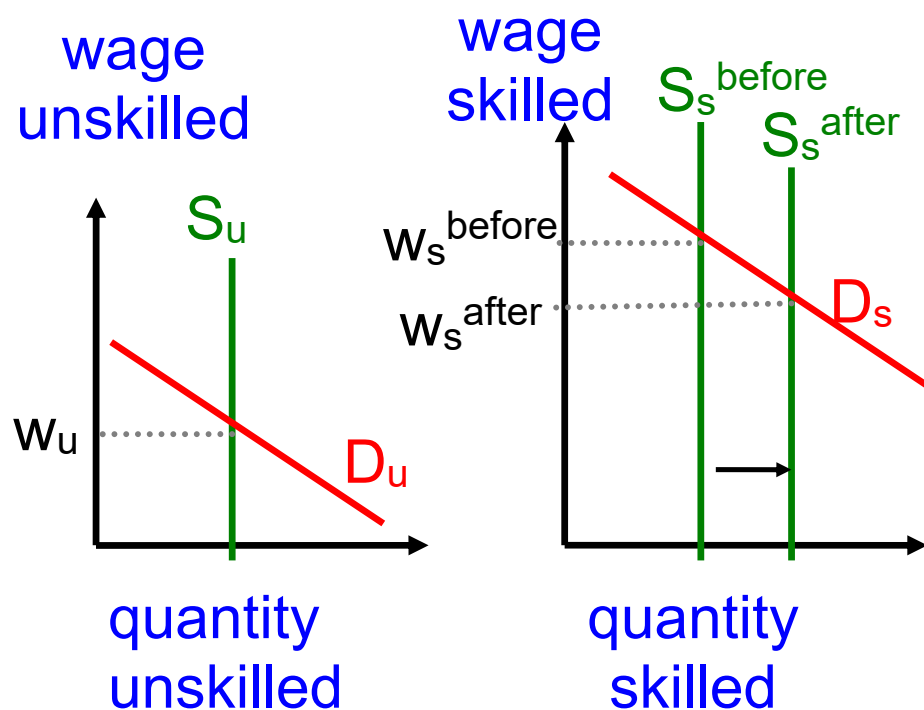


Sergey Brin
(Russia)
cofounder
Google



Indra Nooyi
(India)
CEO Pepsi

Effects of immigration by high skill?
Suppose there is no increasing returns, no knowledge spillovers, and no shift in labor demand



Above doesn't take into account shifts in labor demand.

But even if we allow for increases in labor demand, if there are no increasing returns, then immigration of high skill labor, fixing the quantity of low skill workers, will reduce wages of skilled workers relative to unskilled.

But still we get a beneficial
Fiscal Impact

High skill workers tend to pay more taxes than they cost in public service, so collectively we make money on them when they come.

Now take into account knowledge spillovers.

High skill immigrants can increase the productivity of other high skill workers.

High skill workers are the drivers of the knowledge economy.

Bad idea to tell Sergey Brin and Indra Nooyi to go back home!

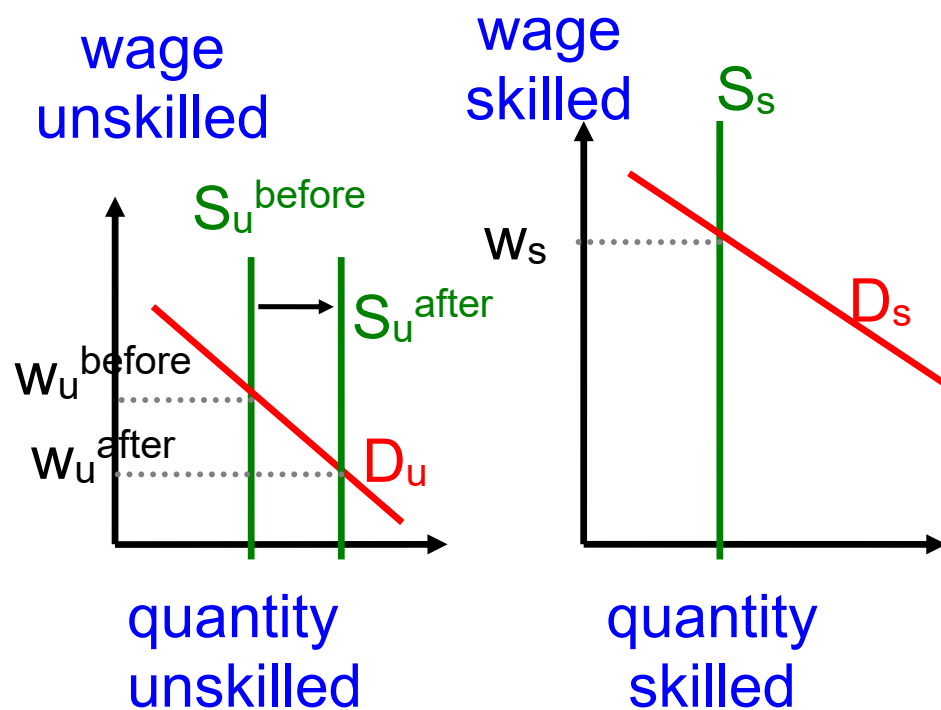
Immigration into the U.S. is limited, and preferences are mainly given to relatives.

There are some programs to allow skilled workers in, but it is a small percent of 1,000,000 immigrants a year.

H-1B program: 85,000 spots for highly-educated foreign professionals.

Excess demand for these slots filled by lottery. (In 2014, applications were considered April 1, by April 5, 124,000 application submitted, stopped collecting.

Next look at **low skill** immigration
Without changes in labor demand
we get



Effects of low skill immigration

low skill wage: will fall relative to high skill wage

- decline will be relatively small if demand for unskilled labor is elastic because it is possible to outsource to foreign workers overseas, or to robots here

fiscal impact: Negative. Very low skill workers generally take out more in public services (public schools, health care), then they pay in taxes

contribution to knowledge spillovers?: Probably not, but maybe children of low skill

immigrants will become educated and create knowledge spillovers.

Note: above focuses entirely on economic issues. There potentially also cultural factors and political factors for citizens of a country might vote to limit immigration.

Japan: limits immigration and population is declining (-0.2% a year). Ethnically homogenous population, there seems to be political support to keep it that way.