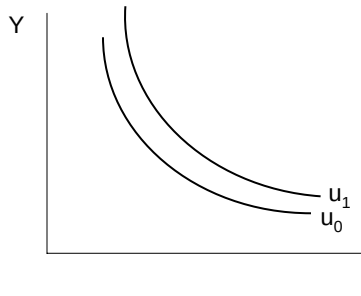
Income-Leisure Choice



Assumptions

1. Complete ordering
2. More is better
3. Transitivity
4. DMRS

- Utility increases as you move outward
- The 4 assumptions give us smooth well-behaved IDCs

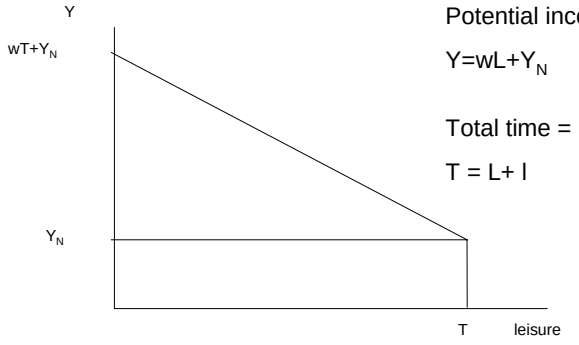
Potential Income Constraint

Individuals try to attain the highest possible IDC. However, they are constrained by their potential income constraint.

It is a “potential” income constraint because it indicates various amounts of income that can be obtained by giving up leisure and working at the market wage.

The “actual” amount of income received depends on the hours you decide to work at the market wage plus your non-wage income (income from other sources).

More specifically, the slope of the potential budget constraint depends on the market wage – the higher the market wage the steeper the slope.



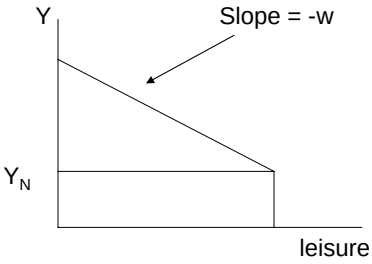
Potential income constraint

$Y=wL+Y_N$

Total time = labor + leisure

$T = L + l$

What is the slope of the potential income constraint?



In a standard two good case:

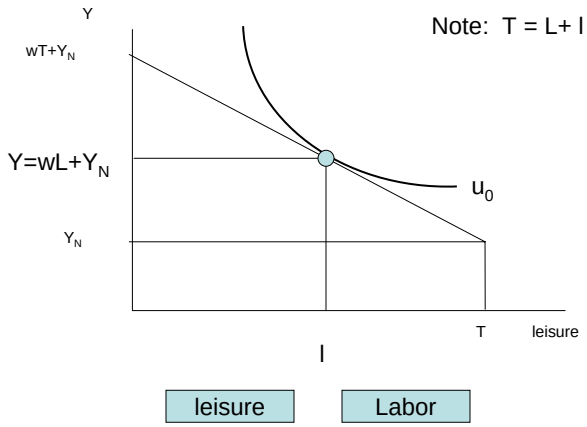
$pY + wl = Y^*$

where Y* = income

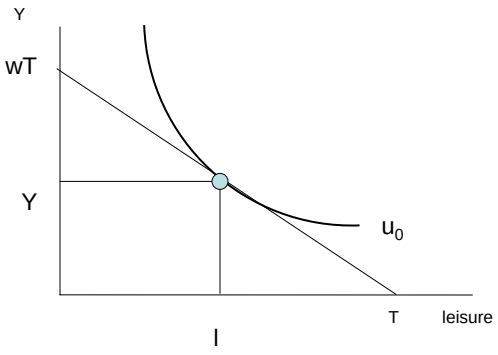
But in this case, income depends on the leisure/labor choice:

$$pY = wL + Y_N$$
$$pY = w(T - l) + Y_N$$
$$pY + wl = wT + Y_N \quad \Rightarrow \quad Y = \frac{1}{p}(wT + Y_N) - \frac{w}{p}l \quad \Rightarrow \quad Y = (wT + Y_N) - wl$$

Combining the IDC and the potential income constraint gives us the labor-leisure choice.



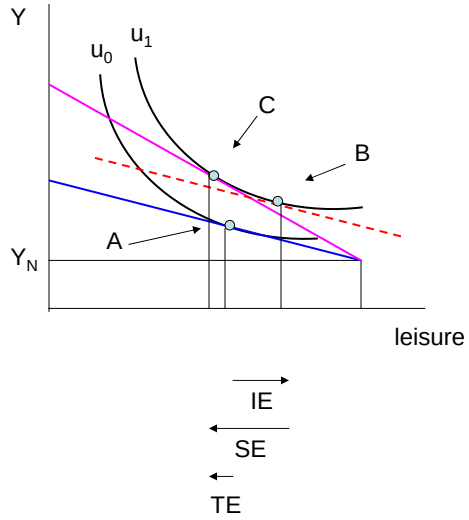
It is often assumed that non-labor income is zero.



Income and Substitution Effects of a Wage Change

- What happens to the equilibrium amount of work effort if the wage rises?
  - You might work more because the return to work effort is higher. In other words, you might **SUBSTITUTE** away from leisure because the OPPORTUNITY COST of leisure is higher.
  - On the other hand, a higher wage rate also means that you have a higher income for each quantity of work. Since you hit your target income faster you might want to work less. This is called the **INCOME** effect. The idea is that with more income you can afford to buy more leisure (assuming that leisure is a normal good).
  - So, the income and substitution effects work in opposite directions.
    - Which one dominates is therefore an empirical question.

Income and Substitution Effects

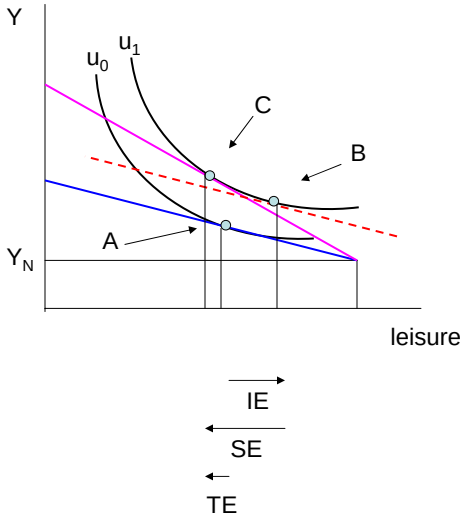


Income and Substitution Effects

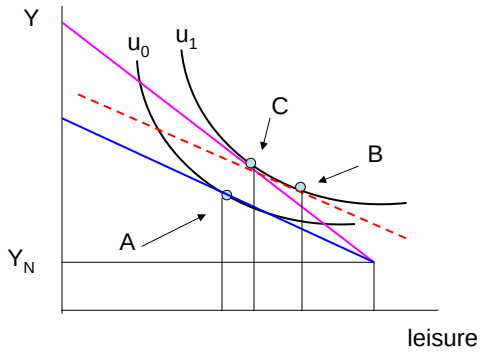
The difference between A and B is purely a matter of having more potential income from which you can buy more leisure. If leisure is a normal good then B lies above and to the right of A.

The difference between B and C is now a pure (or income compensated) substitution effect, since you are on the same IDC. The only difference is that the relative price of leisure is higher. As a result, you will substitute away from the now more expensive leisure towards work. The SE always increases work effort.

In our example, the SE>IE, so a wage increase leads to more work effort and less leisure.



It is also possible for the IE>SE. In this case, a wage increase leads to less work effort and more leisure.



IE

SE

TE

Deriving the labor supply curve

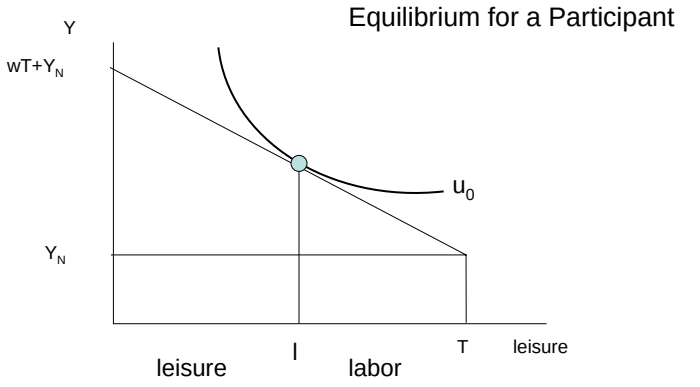
- we will do this in class

Labor supply elasticity

Labor supply elasticity measures a worker's responsiveness to wage changes. In other words, it measures the change in hours of work in response to a wage change.

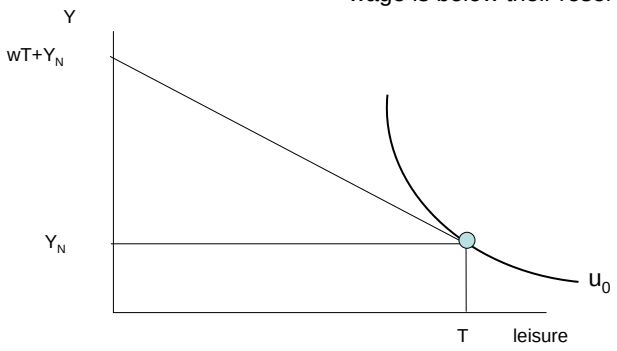
$$\eta = \frac{\%\Delta L}{\%\Delta w} = \frac{\Delta L / L}{\Delta w / w} = \frac{\Delta L}{\Delta w} * \frac{w}{L} = \frac{\partial L}{\partial w} * \frac{w}{L}$$

The Participation Decision



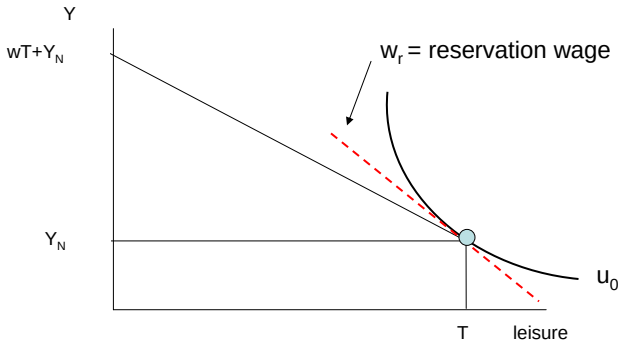
How do you decide whether or not to participate in the labor market?

This person will not work. The market wage is below their reservation wage.



Equilibrium for a Non-Participant

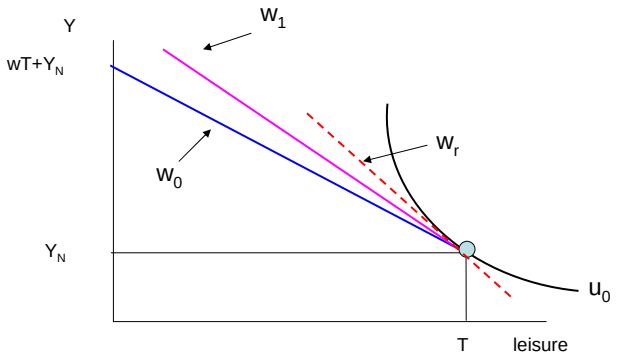
The reservation wage is the wage at which an individual is indifferent between participating and not participating in the labor market.



When the MRS>w at T you will not participate in the labor market because the implicit value of non-market time is high relative to the explicit market value of non-market time.

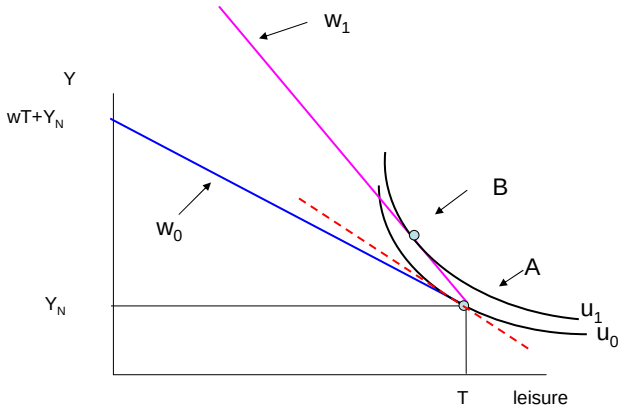
What happens to a non-participant if the wage rises?

Case 1



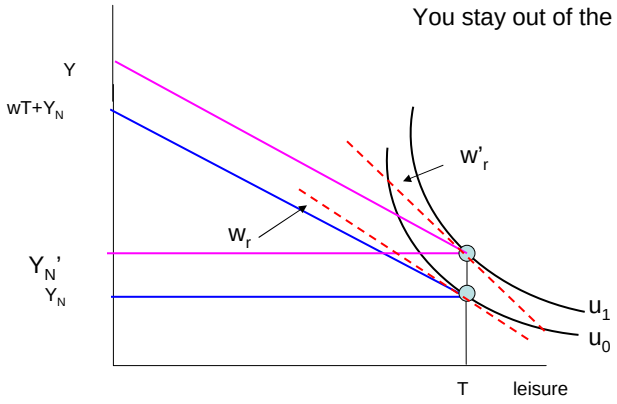
What happens to a non-participant if the wage rises?

Case 2



What happens to a non-participant if Y_N rises?

You stay out of the market

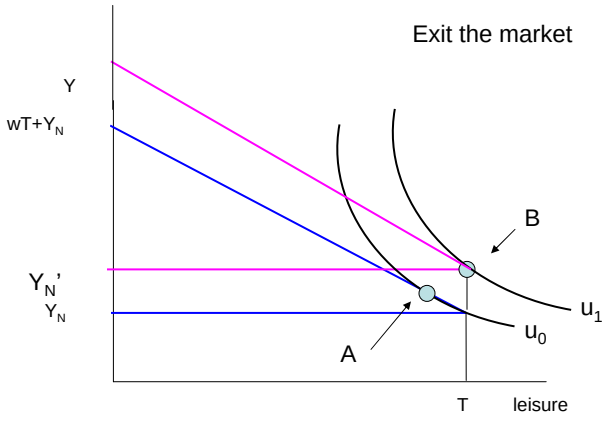


If leisure is normal, an increase in non-wage income never causes anyone to enter the labor market.

What happens to a <u>participant</u> if Y_N rises?

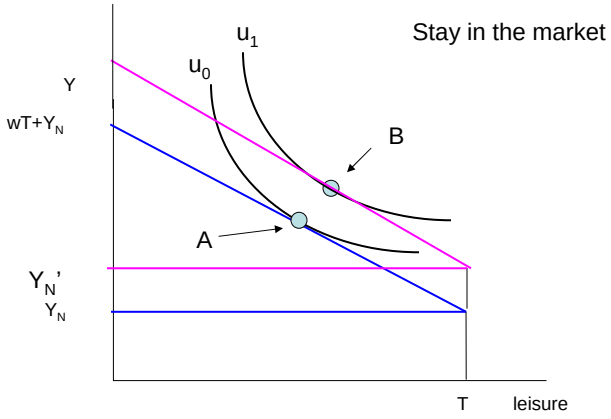
<u>Case 1</u>

Exit the market



What happens to a participant if Y_N rises?

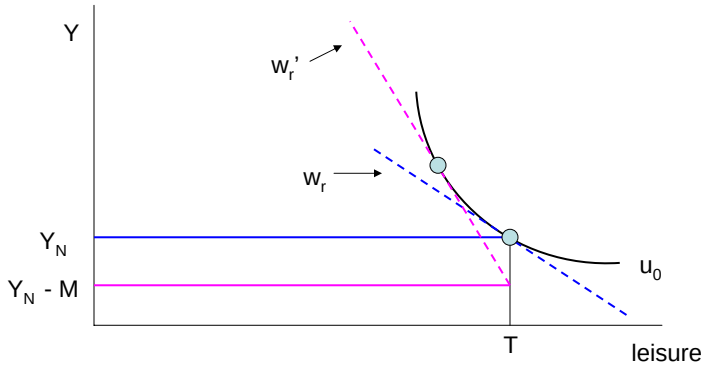
Case 2



Given what we have discussed, what types of people are more likely to work in the labor market and what types of people are less likely to work in the labor market?

What if there are fixed costs?

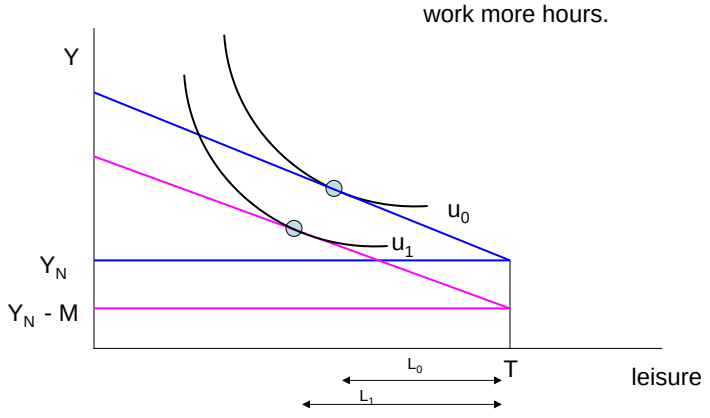
- Fixed monetary cost: “Start-up” costs that are independent of the number of hours worked.
- What happens to the reservation wage?



What if there are fixed costs?

- What if you have chosen to work and then a fixed monetary cost is imposed?

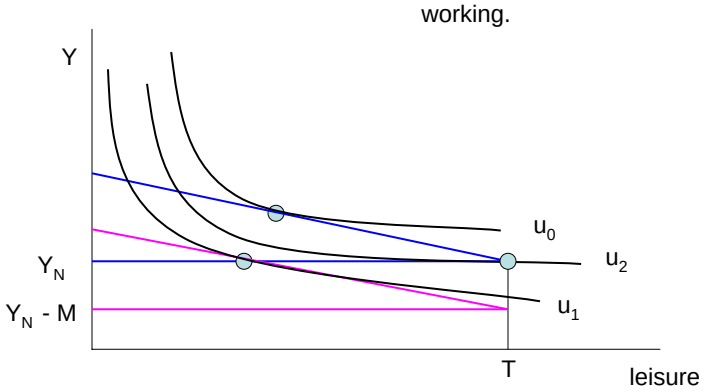
If you continue to work you work more hours.



What if there are fixed costs?

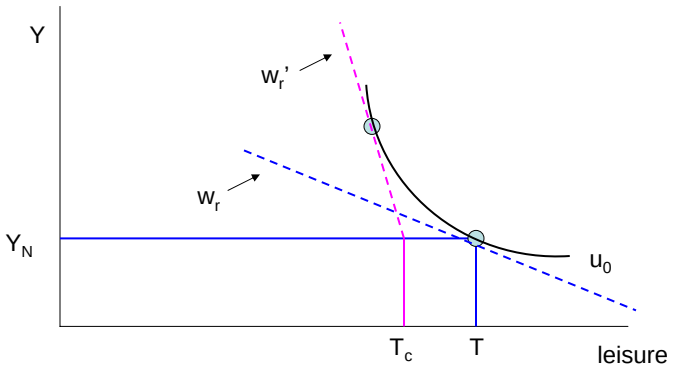
- What if you have chosen to work and then a fixed monetary cost is imposed?

Or, you might choose to quit working.



Fixed Time or Commuting Costs

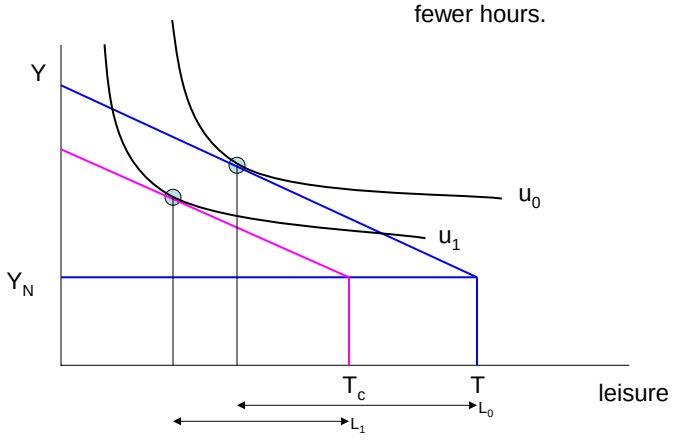
- How does the reservation wage change when there are fixed time costs?



Fixed Time or Commuting Costs

- What if you have chosen to work and then a fixed time cost is imposed?

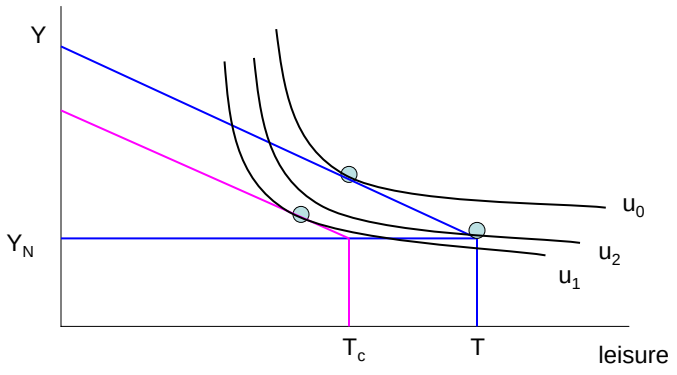
If you keep working, you work fewer hours.



Fixed Time or Commuting Costs

- What if you have chosen to work and then a fixed time cost is imposed?

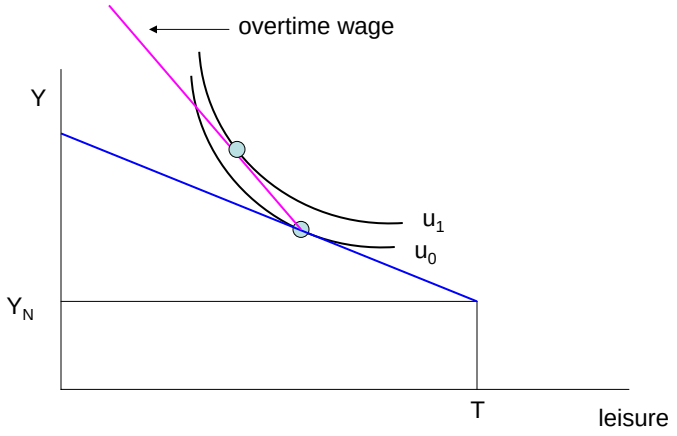
Or you quit working.



Fixed cost discontinuities in labor supply
- we will derive this in class

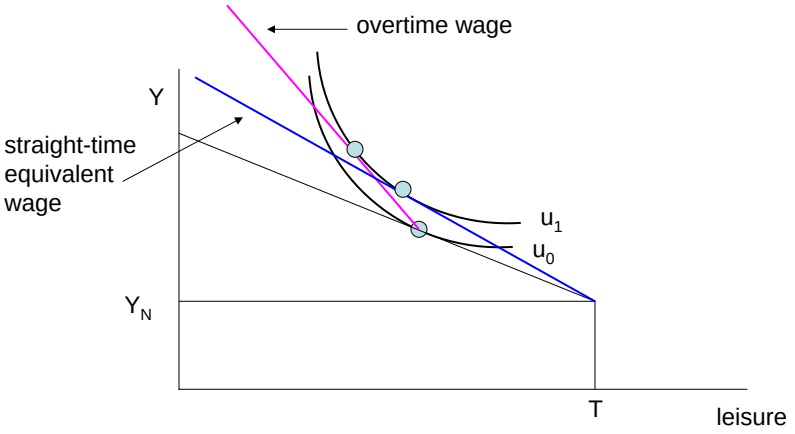
Overtime wages

- Labor supply increases by construction if the overtime wage starts at the equilibrium labor supply choice.



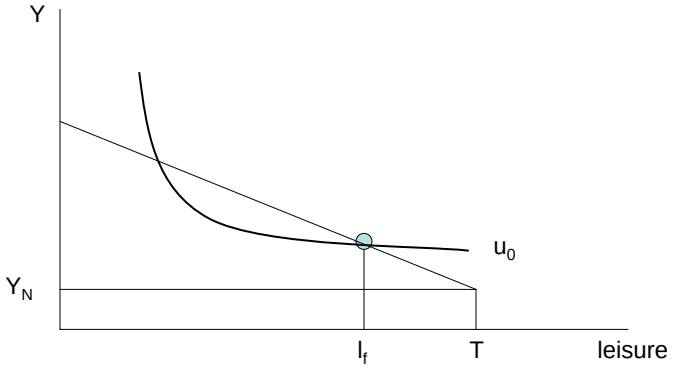
Overtime versus the straight-time equivalent

- An overtime wage increases work effort by more than an equivalent increase in the wage.



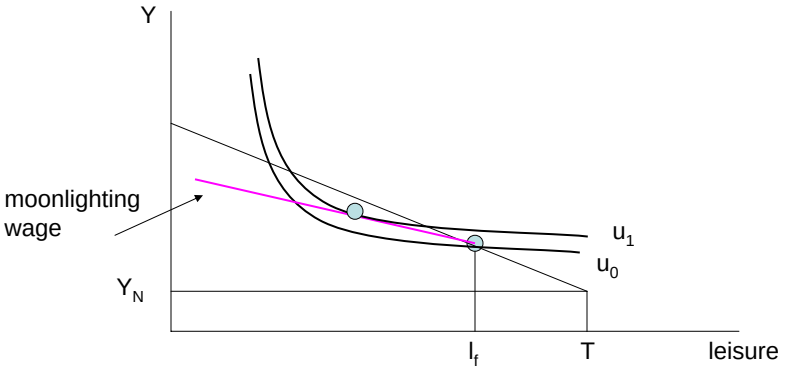
Fixed Work Days

- Fixed work days can lead to underemployment.



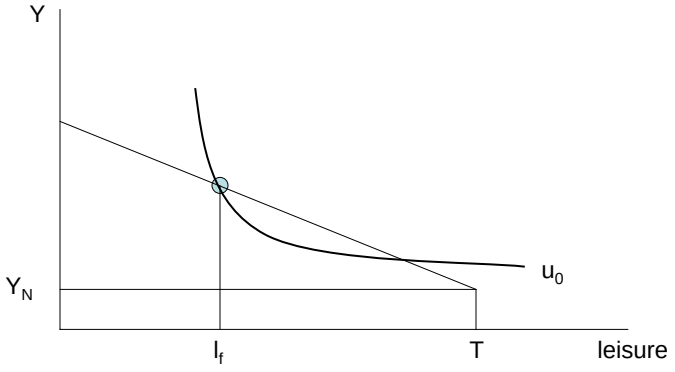
Fixed Work Days

- If you are under employed you might be willing to work extra hours for a lower wage (“moonlight”).



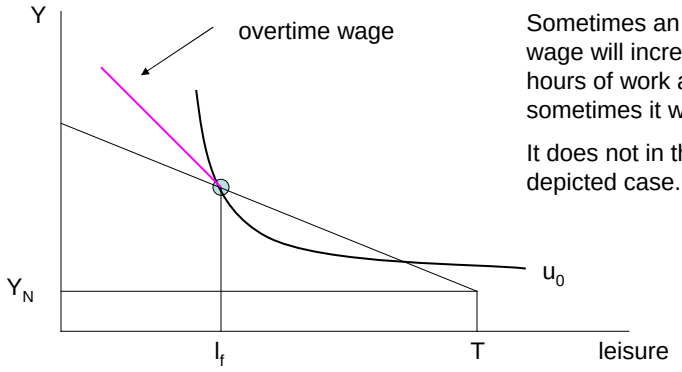
Fixed Work Days

- Fixed work days can also lead to over-employment.



Fixed Work Days

- In this case even an overtime premium might not lead to increased work hours.

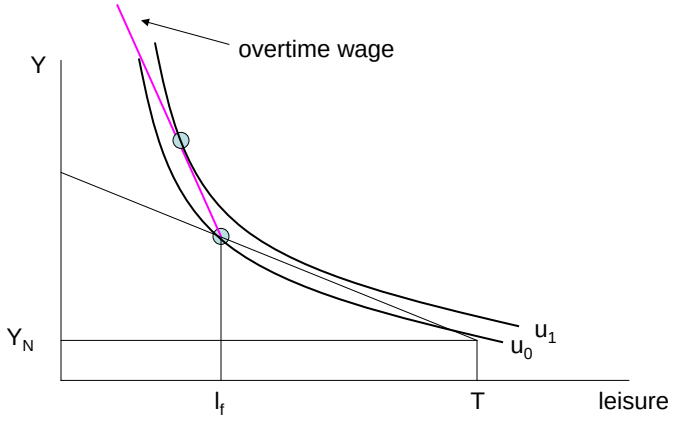


Sometimes an overtime wage will increase hours of work and sometimes it will not.

It does not in the depicted case.

Fixed Work Days

- Or, you might work more.

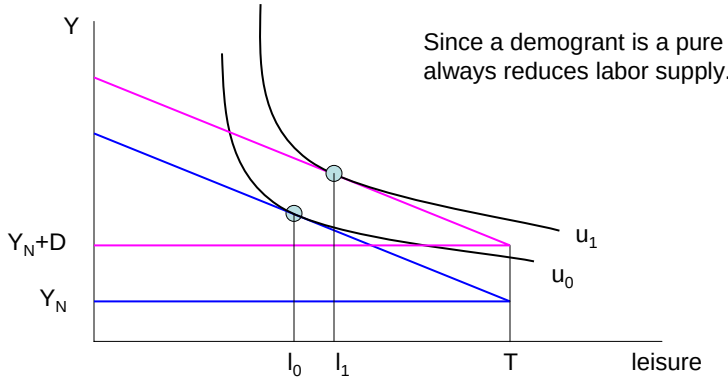


Work incentive effects of income support schemes

- Income support programs affect behavior by altering opportunities (potential income constraints).
- To analyze the effect of a specific program ask yourself two questions:
  - What is the impact on non-labor income?
  - What is the impact on the wage?
- We will discuss the following income support mechanisms: demogrants, welfare, negative income taxes, and wage subsidies.

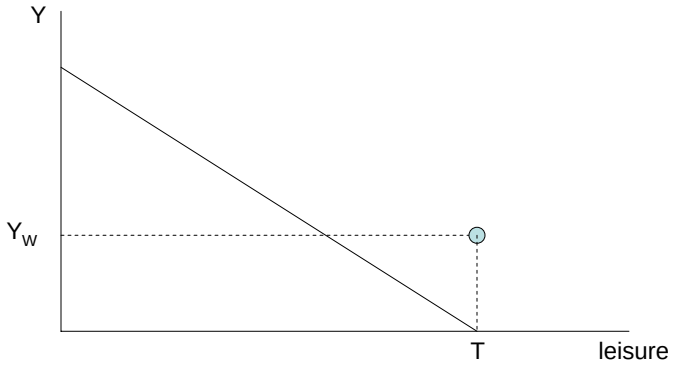
Demogrant

- Examples include: family allowance and old age pensions in most countries.



Welfare

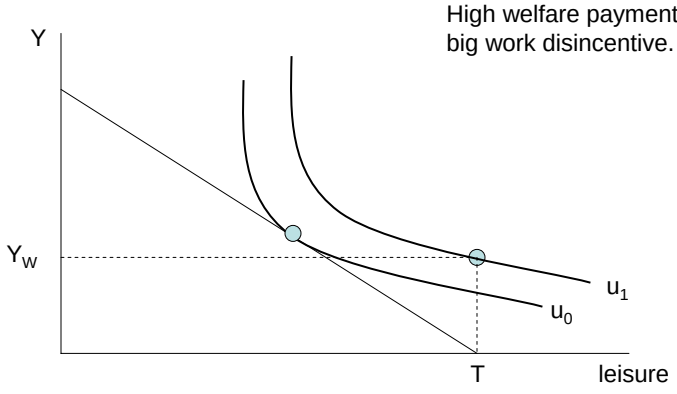
- You must have no non-wage income to qualify.
- Every dollar you earn is taken off your welfare payment.



Welfare

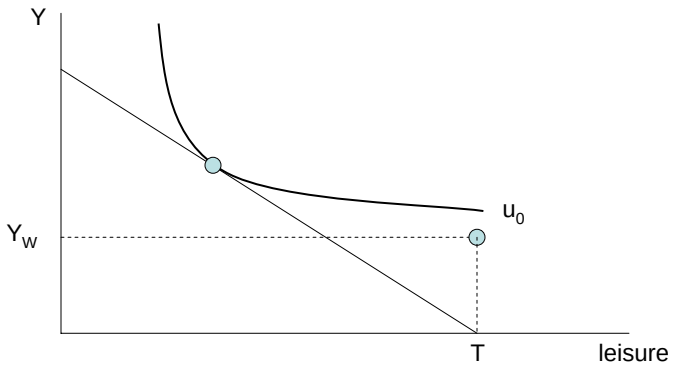
- Case 1: leave work for welfare.

High welfare payments have a big work disincentive.



Welfare

- Case 2: keep working.

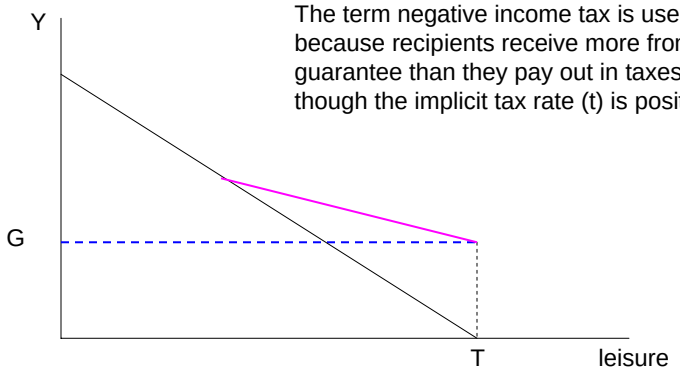


How can we get people off welfare?

- Reduce the welfare payment
- Increase wages
- Reduce the 100% implicit tax of welfare

Negative Income Tax

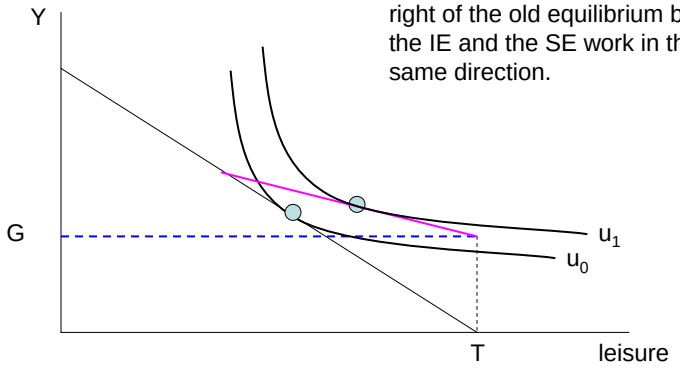
- Income after taxes and transfers is Y= G+ (1-t)E where G is the basic guarantee



The term negative income tax is used because recipients receive more from the guarantee than they pay out in taxes, even though the implicit tax rate (t) is positive.

Negative Income Tax

Case 1: Keep working, but work less

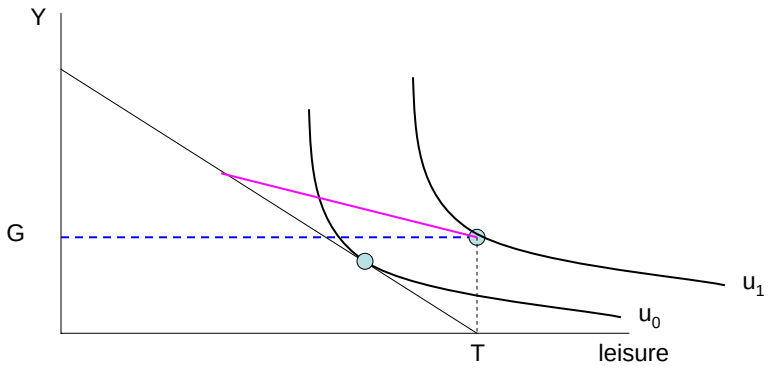


Assuming that leisure is normal, the new equilibrium will lie to the right of the old equilibrium because the IE and the SE work in the same direction.

But notice that the work disincentive effect is less than for welfare.

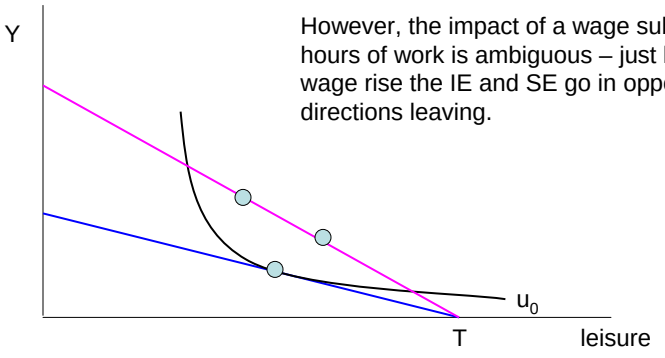
Negative Income Tax

Case 2: Quit working



Wage Subsidy

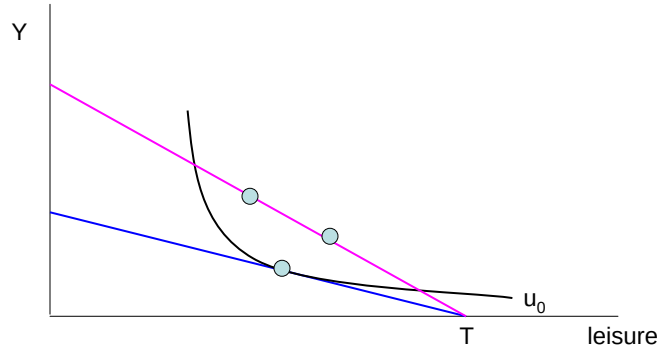
- Since one of the problems with negative income tax and welfare is that they discourage work effort, some have suggested using a wage subsidy instead.



However, the impact of a wage subsidy on hours of work is ambiguous – just like a wage rise the IE and SE go in opposite directions leaving.

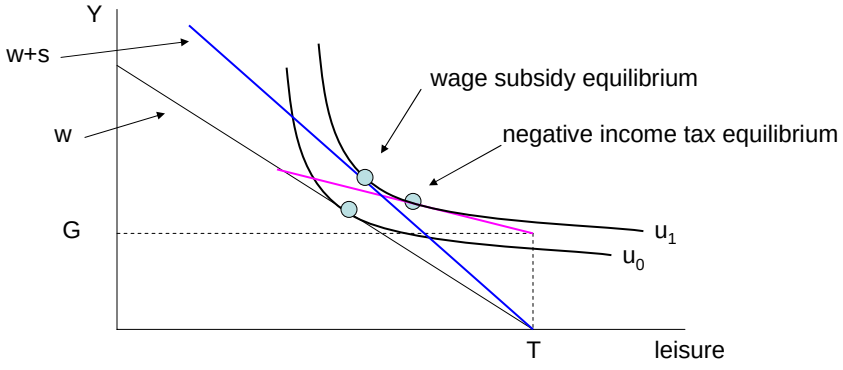
Wage Subsidy

- However, the disincentive effects of a subsidy are smaller than those for an EQUIVALENT (same utility) negative income tax.



Wage Subsidy

However, the disincentive effect of a wage subsidy is lower than for an EQUIVALENT (same utility) negative income tax.



This is not to say that a wage subsidy is necessarily better.

- A wage subsidy does nothing to help unemployables.
- A negative income tax targets the poor better (given limited funds for income support payments) because payments depend on income level.

We will discuss the major points of the Moffitt paper in class at this point.

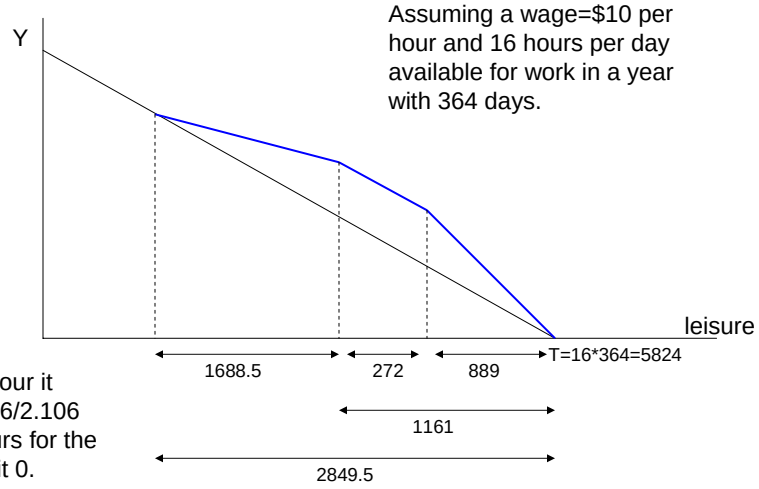
Earned Income Tax Credit

- The earned income tax credit (EITC) is another way to help low-income individuals.
- By the late 1990s EITC was the largest cash benefit program in the U.S. granting almost $25 billion per year.

Earned Income Tax Credit

- In 1996, a single woman with 2 kids could claim a credit of up to 40% of her earnings as long as she earned less than $8890 per year.
  - The resulting maximum credit is $3556 for a total of $12,446
- The maximum credit is available as long as she earns between $8890-$11,610 for a total between $12,446-$15,166.
- Beyond $11610 the credit begins to be phased out.
  - Each additional $1 earned reduces the credit by $0.2106 until the credit is credit is gone.

EITC

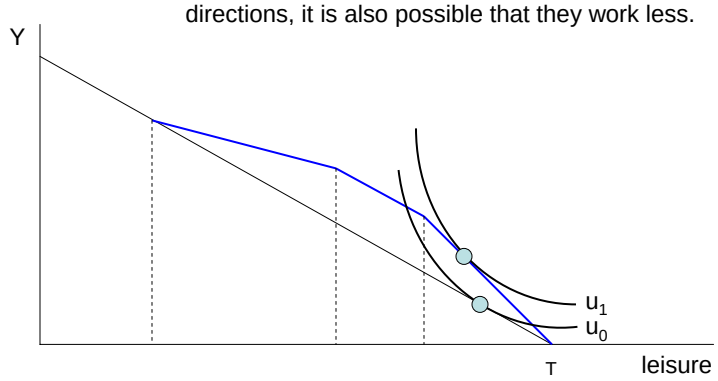


Assuming a wage=$10 per hour and 16 hours per day available for work in a year with 364 days.

At $10 per hour it takes L=3556/2.106 =1688.5 hours for the subsidy to hit 0.

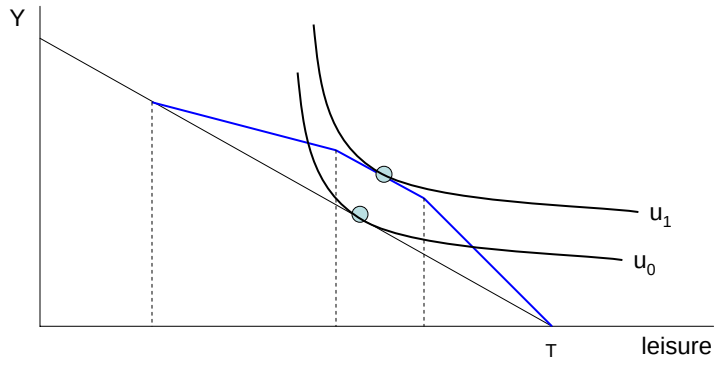
EITC and Labor Supply

In general, one would expect employment to increase for this person, but as the IE and SE go in opposite directions, it is also possible that they work less.



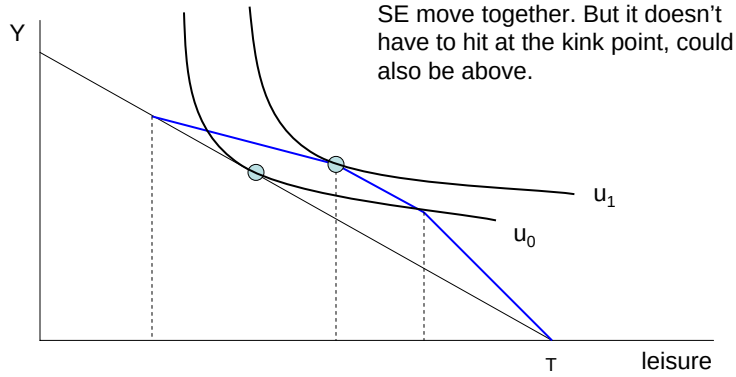
EITC and Labor Supply

Employment decreases – pure IE

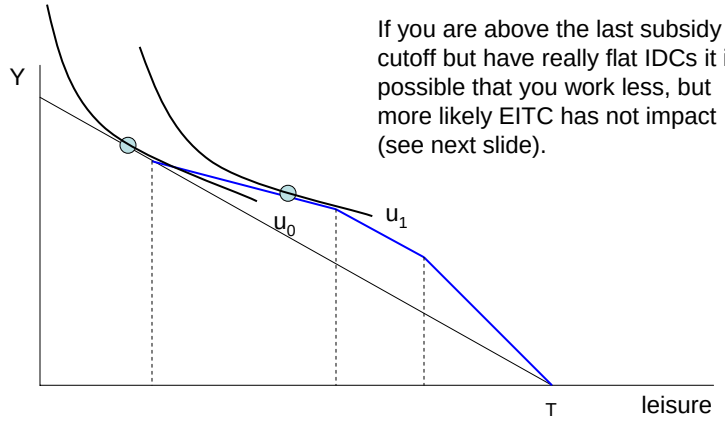


EITC and Labor Supply

Employment decreases – IE and SE move together. But it doesn't have to hit at the kink point, could also be above.

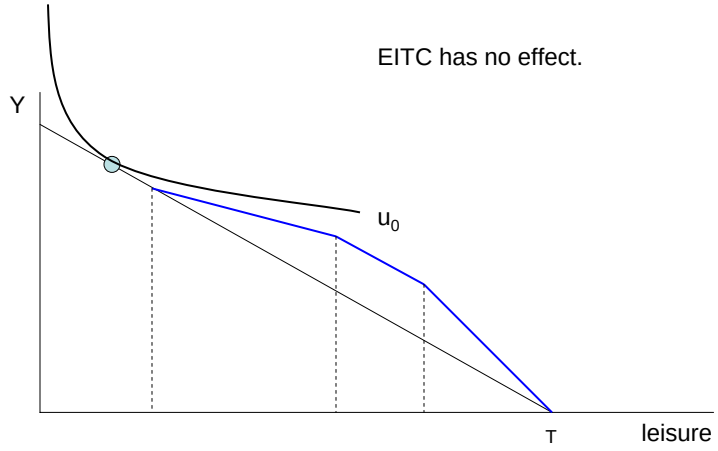


EITC and Labor Supply



If you are above the last subsidy cutoff but have really flat IDCs it is possible that you work less, but more likely EITC has not impact (see next slide).

EITC and Labor Supply



EITC has no effect.

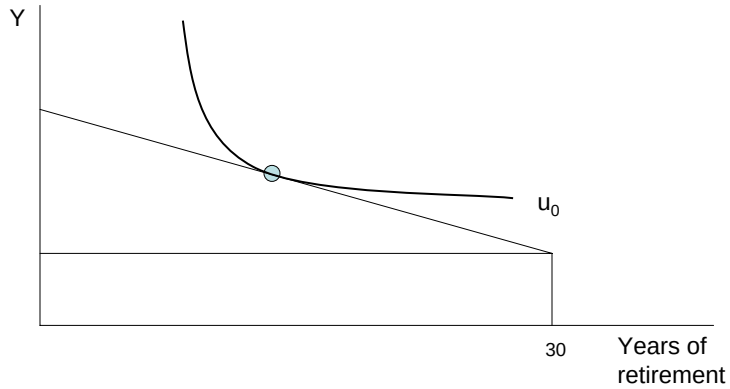
In general, EITC has not impact on high wage people.

Retirement

- Between 1950 and 2000 the labor force participation rate of men aged 55-64 fell from 87% to 67%.
- What caused this?

Retirement

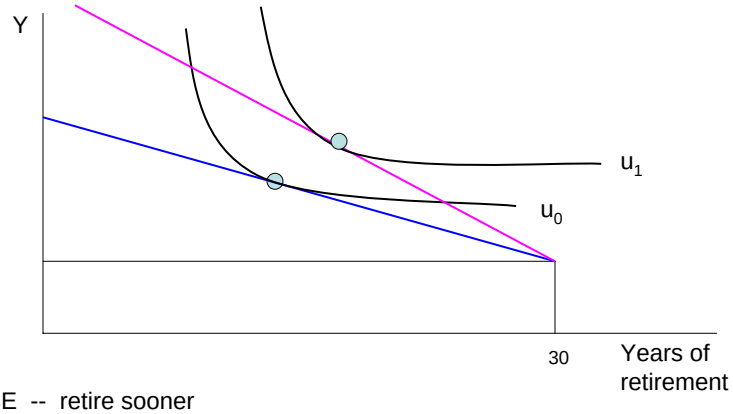
Imagine that you are 50 and trying to decide when to retire. Assume that you expect to live until 80.



Retirement

Case 1: Retire sooner

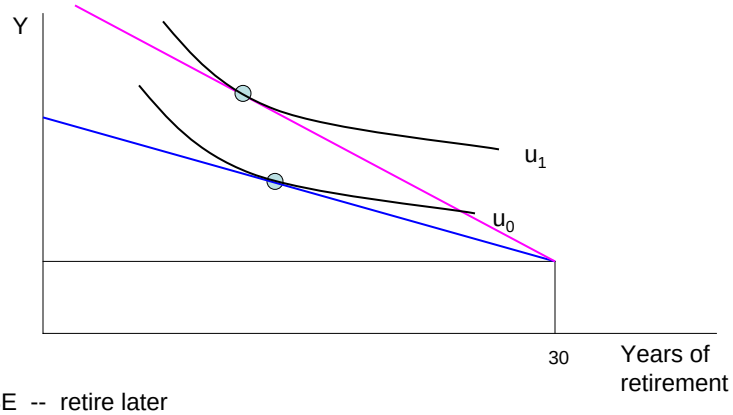
How does a wage increase effect your retirement decision?



IE>SE -- retire sooner

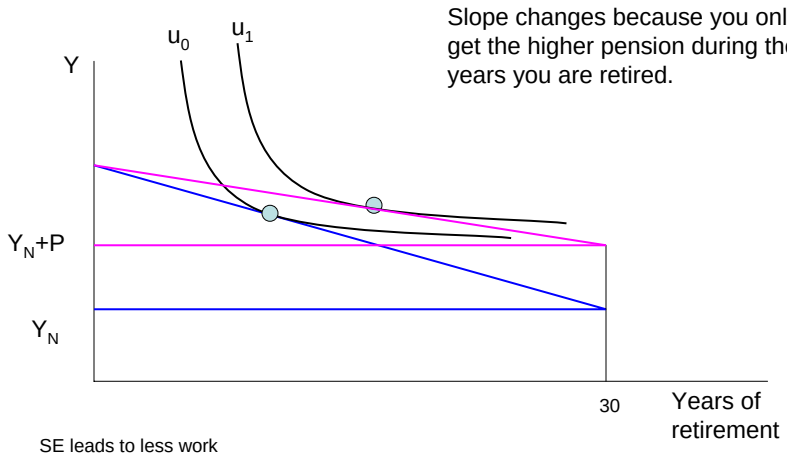
Retirement

Case 2: Retire later



IE<SE -- retire later

How does a pension benefit increase effect the retirement decision?



Slope changes because you only get the higher pension during the years you are retired.

SE leads to less work

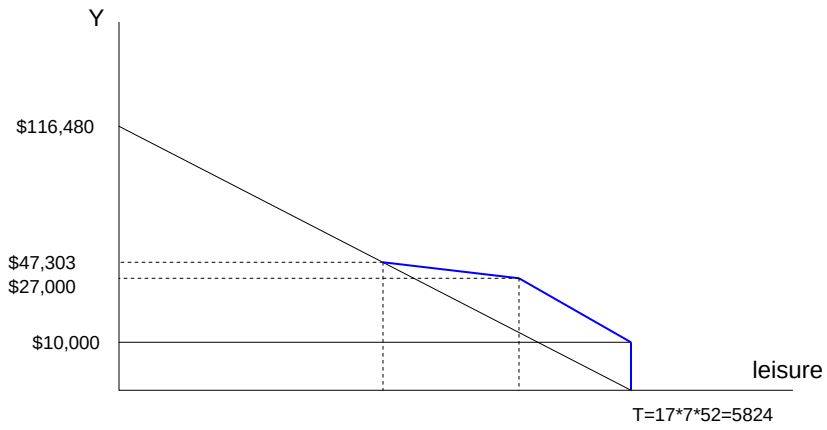
IE leads to less work

So you retire sooner

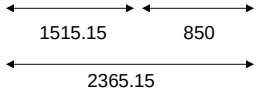
Social Security

- So far we have assumed that a retired person withdraws completely from the labor market.
- But many retired people work at least part time.
- As of 2000, the Social Security system allows people 65-69 to earn $17,000 with no penalty, but after that they face a 33% tax back rate.
- The earnings test does not apply after age 70

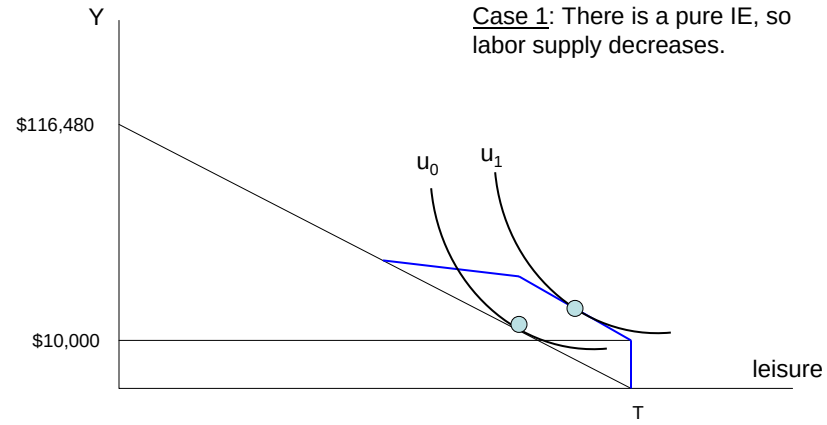
Suppose Social Security is $10,000 and the going wage rate is $20 per hour. Assuming no other non-wage income.



With a tax back rate of 33%, subsidy is zero:
L=10,000/6.6=1515.15 hours

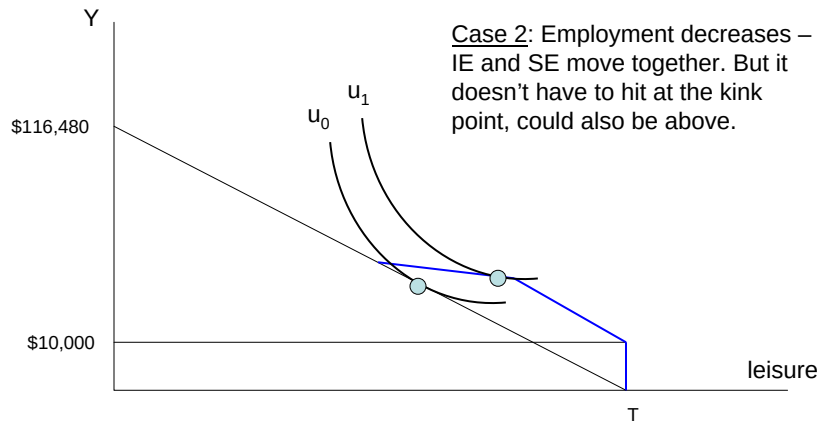


How does Social Security impact labor supply?



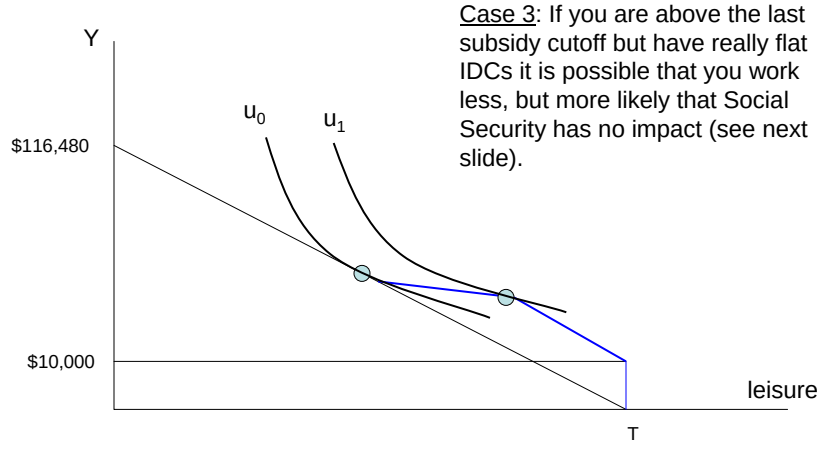
<u>Case 1</u>: There is a pure IE, so labor supply decreases.

How does Social Security impact labor supply?



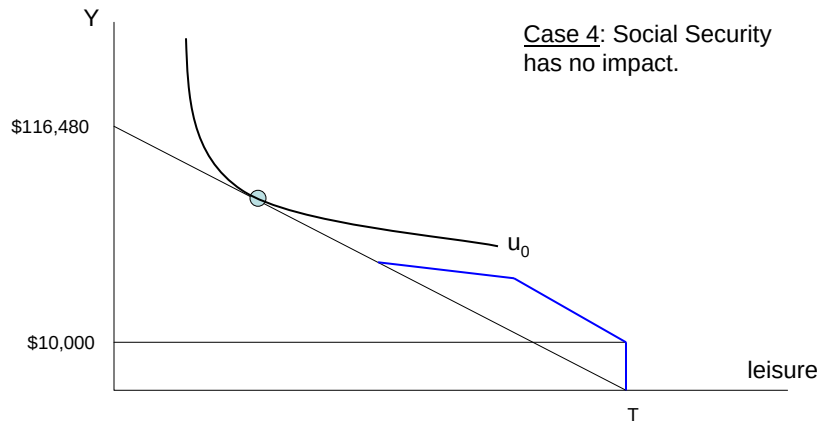
Case 2: Employment decreases – IE and SE move together. But it doesn't have to hit at the kink point, could also be above.

How does Social Security impact labor supply?



Case 3: If you are above the last subsidy cutoff but have really flat IDCs it is possible that you work less, but more likely that Social Security has no impact (see next slide).

How does Social Security impact labor supply?



Household Production

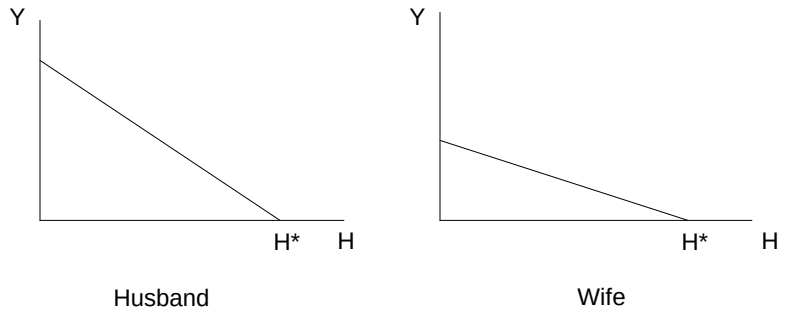
- Much of what we have so far referred to as leisure is really just another form of work.

Question: Why do some family members specialize in labor market work and some in household production?

Household Production

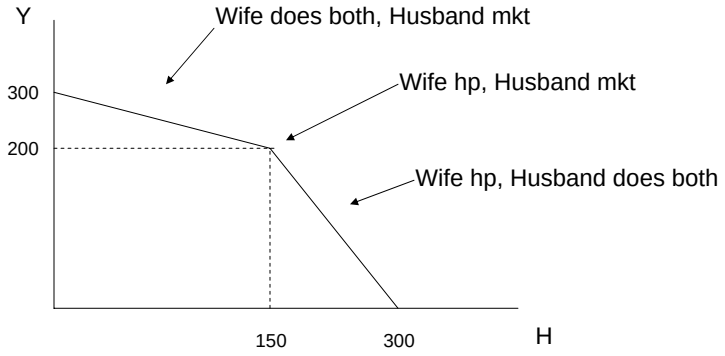
- Consider a married couple.
  - The only way to get money is to work in the market sector and the only way to get household commodities is to work in the household
- Let's begin by considering a "traditional" family where the husband's wage is higher.
- Let's also assume that men and women are equally productive at home.

Household Production



The opportunity frontier for the couple is:

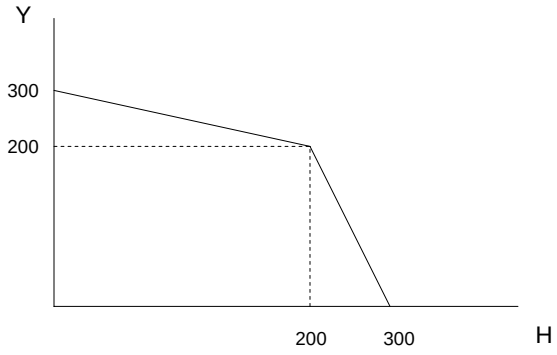
Assume the following: (a) there are 10 available hours, (b) H*=150,
(c) w_h = 20, (d) w_w = 10



Where the household ends up depends on their preferences over H and Y.

What if? (a) hours = 10, (b) H_w*=200, (c) H_h*=100
(c) w_h = 20, (d) w_w = 10

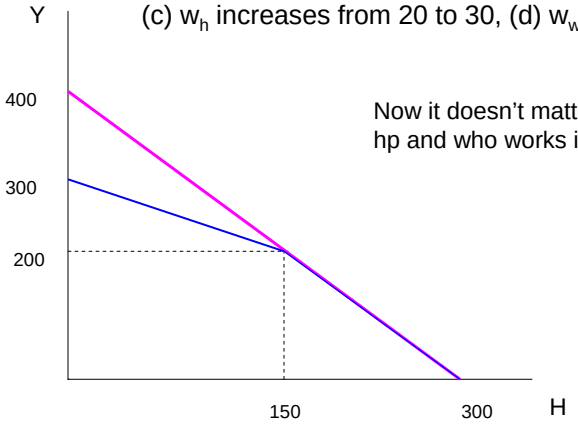
Notice that this production frontier is entirely higher than the last one because of the return to specialization.



Where the household ends up depends on their preferences over H and Y.

What if the husband's wage rises?

Assume the following: (a) hours = 10, (b) H*=150,
(c) w_h increases from 20 to 30, (d) w_w = 10



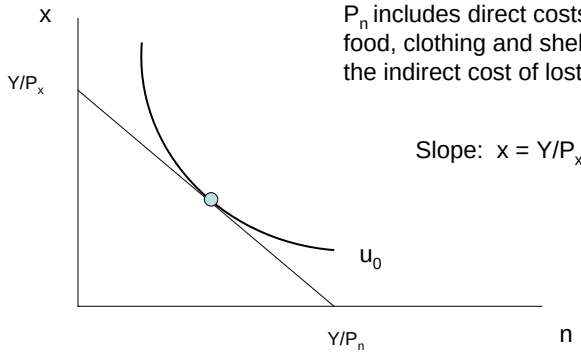
Now it doesn't matter who does hp and who works in the mkt

Fertility

- "Essays on the Principle of Population" Malthus (1798)
  - As incomes rise above subsistence people marry younger and have more children leading to an increase in population and a return to subsistence.

The household decision

Assume that household utility is a function of goods (x) and children (n), where utility is increasing in n and x. And, the household's budget constraint is $P_n n + P_x x = Y$

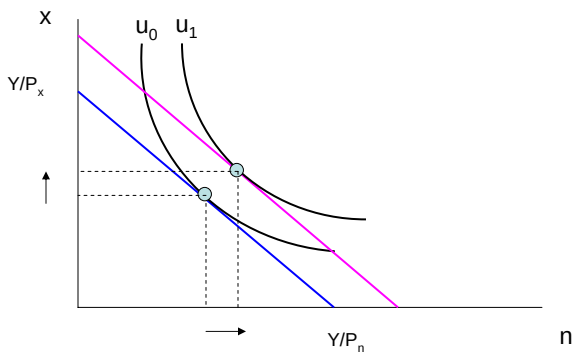


P_n includes direct costs such as food, clothing and shelter as well as the indirect cost of lost wages

Slope: $x = Y/P_x - (P_n/P_x)n$

If non-wage income rises

Assuming both goods are normal.



If the price of children rises