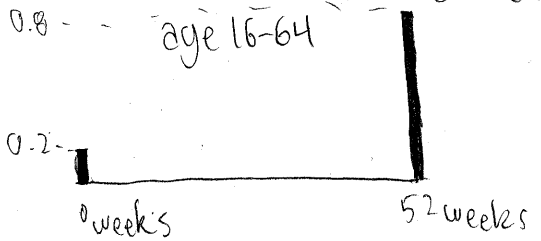
Labor supply (CPS 2000)

Women are more likely to work part time, but:



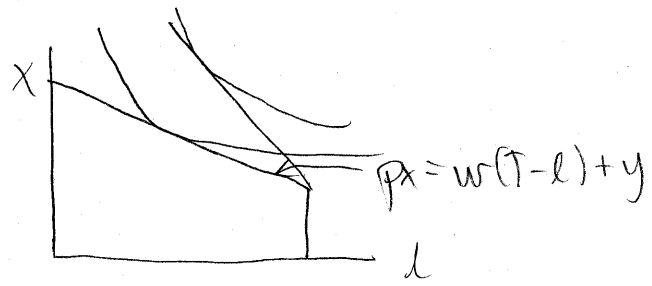
Hours: Mode of 45% of prime-aged males working 40 hours.
- Two questions: Last week, how many hours did you work?
- How many hours in main job?

Hours per year: in labor force: large mode at ~2000 hours.
- people take logs, but you lose the zeros.

Some individuals work multiple jobs at different wage rates. Econometricians treat this as a measurement error problem.

Educated workers have much less cyclical variation in hours worked.

There is not enough cyclical variation in wages to explain cyclical variation in hours worked.



The dual problem:

$$\min_{x,l} \; px + wl$$
$$\text{s.t. } u(x,l) = \bar{u}$$

No substitution effect if Leontief preferences.

The minimand is $e(p,w,\bar{u})$

$\Rightarrow$ $l^c(p,w,\bar{u})$, $x^c(p,w,\bar{u})$ } compensated (Hicksian) leisure/goods

$$h^c(p,w,\bar{u}) = T - l^c(p,w,\bar{u})$$

We are interested in $\frac{\partial h^c}{\partial w} \cdot \frac{w}{h^c}$ (compensated labor supply elasticity)

People who are not working are all substitution effect.

$\frac{\partial h^c}{\partial w} \overset{?}{=} \frac{\partial h}{\partial w}$ what is the relationship here?

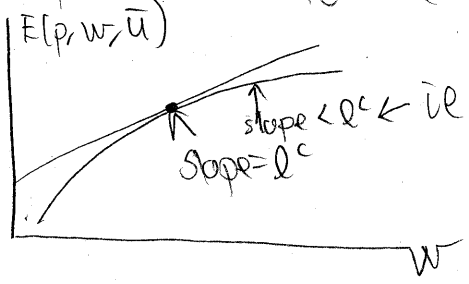
$$E(p,w,\bar{u}) = \min\{px + wl : u(x,l) = \bar{u}\}$$

$wT + y \equiv$ Full income (value of income and time endowment)

$\frac{\partial E}{\partial w} = l^c(p,w,\bar{u})$ Shephard's lemma (envelope theorem)

$\frac{\partial E}{\partial p} = x^c(p,w,\bar{u})$

$E(p,w,\bar{u})$ is concave in prices



← ie substitutes away from leisure if wage goes up.

This implies $0 > \frac{\partial^2 E(p,w,\bar{u})}{\partial w^2} = \frac{\partial \ell^c}{\partial w}$

$\Rightarrow \frac{\partial h^c}{\partial w} > 0$ compensated labor supply function is increasing.

Slutsky equation:

$$p x^c(p,w,\bar{u}) + w\ell^c(p,w,\bar{u}) = \min\{px+w\ell : u(x,\ell)=\bar{u}\} \equiv E(p,w,\bar{u})$$

The y needed to get to $\bar{u}$ is

$$\underbrace{E(p,w,\bar{u}) - wT}_{\text{excess expenditure function}} = px^c + w\ell^c - wT = y$$

- have to give me what it costs me minus what I bring to the table.

Note: $\ell^u(p,w,\overbrace{E(p,w,\bar{u})-wT}^{\bar{y}(p,w,\bar{u})}) = \ell^c(p,w,\bar{u})$

- This is an identity. It defines how much you need to compensate someone.

Differentiating this expression:

$$\frac{\partial \ell^c}{\partial w} = \frac{\partial \ell^u}{\partial w} + \frac{\partial \ell^u}{\partial y}\underbrace{\left[\frac{\partial E}{\partial w} - T\right]}_{\ell^c - T = -h^c}$$

$$\Rightarrow \frac{\partial \ell^u}{\partial w} = \frac{\partial \ell^c}{\partial w} + \frac{\partial \ell^u}{\partial y} h^c$$

$$\Rightarrow \frac{\partial h^u}{\partial w} = \frac{\partial h^c}{\partial w} + \frac{\partial h^u}{\partial y} h^c \quad \leftarrow \text{Slutsky equation}$$

This holds where $h^c = h^u$

Two big things: ◦ can sign unemployed ($h^c = 0$)

◦ $\frac{\partial h}{\partial y} < 0$ and h large for prime-aged males

leisure is a normal good.

$\Rightarrow$ more likely that $\frac{\partial h^u}{\partial w} < 0$

Problem with estimating labor supply elasticities was measurement error. Others:

◦ regressing hours on $\frac{\text{annual earnings}}{\text{hours}}$.

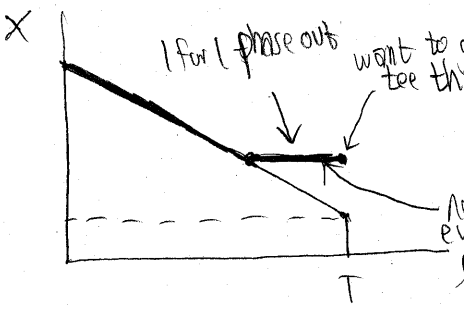
◦ division bias

◦ selection bias

◦ wages are not exogenously assigned.

Everything that the government does has a flavor of a labor supply problem. Can use Slutsky.
- bad work incentives in phase out portion. Income effect goes opposite direction. Which is bigger?

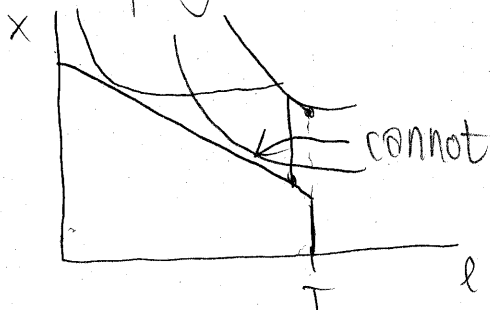
Without transfer, $px = w(\bar{T} - \ell) + y$



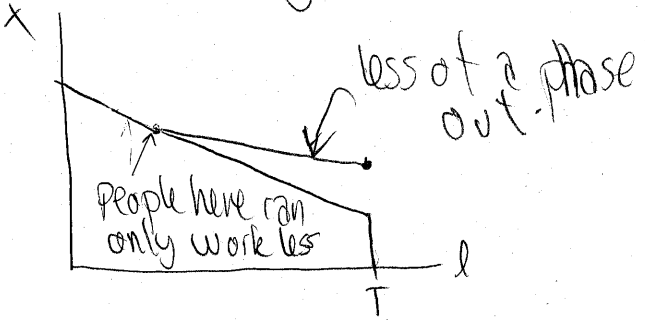
Negative income tax program (NIT): Friedman came up with this. Nixon investigated it.

AFDC - old welfare program. Looked like this
TANF - new one. (emphasis on "temporary")
- not as Draconian in terms of tax rates.

other programs:



Want something more like:



$S = G - t(wh+y)$

S: subsidy; G: guarantee level; t: tax rate

The budget set becomes:

$$px = w(T-\ell) + y + S$$

$$px = \begin{cases} G + (1-t)y + w(1-t)(T-\ell) & \text{if } S > 0 \\ w(T-\ell) + y & \text{if } S \leq 0 \end{cases}$$

When is $S=0$? $wh+y = \frac{G}{t} = B$ (below what earnings level are we paying people?)

B: breakeven

EITC: