EMPIRICAL ANALYSIS OF TAXATION AND LABOR SUPPLY

14.471 - Fall 2012

Labor Income is Roughly 65% of National Income

Composition and Disposition of Personal Income, 2011 ($ trillion)

	2011
Wage and Salary Income	6.68
Pensions & Insurance	1.11
Social Insurance Contributions (FICA)	0.50
Total Compensation	**8.29**
Proprietor’s Income	1.11
Interest	1.00
Dividends	0.79
Rental Income	0.40
“Capital Income”	**3.30**
Social Security & Disability & Medicare	1.27
Other Transfers	1.07
Transfer Income	**2.34**
(Contributions for Social Insurance)	**(0.93)**
PERSONAL INCOME	**13.00**
(Personal Current Taxes)	**(1.40)**
DISPOSABLE INCOME	**11.60**
Consumption Expenditures	10.73

Source: National Income and Product Accounts, Table 2.1.

Federal Income Tax Rates Applicable to Wage Income

Taxable Income Over	But Less Than	Marginal Tax Rate
Single (Deduction = 5950, Personal Exemption = 3800, Filing Threshold = 9750)		
0	8700	10
8700	35350	15
35350	85650	25
85650	178650	28
178650	388350	33
388350	n/a	35
Married Filing Jointly (Deduction = 11900, Personal Exemption = 3800 * Number of Dependents, Filing Threshold w/2 Children = $27100)		
0	17400	10
17400	70700	15
70700	142700	25
142700	217450	28
217450	388350	33
388350	n/a	35

Earned Income Tax Credit for Single Parent with 2 Children

Earned Income Over	But Less Than	EITC Situation
0	13090	40% Credit
13090	17090	No Marginal Effect of Earnings
17090	41952	21.06% Tax

Payroll Tax: Employer & Employee Equal Rates for Social Security & Medicare Trust Funds

Medicare Tax: 1.45% of earnings, no earnings limit (2.9% total)
Social Security (FICA): 6.2% of earnings to maximum of $110,100 (12.4% total rate). The employee tax rate is reduced to 4.2% temporarily (extended through December 31, 2012)

Other Taxes to Consider:

i) Alternative Minimum Tax (AMT)
ii) Tax on Social Security Benefits (Taxpayers Over Age 62)
iii) Implicit Tax Rates Associated with Transfer Programs

Distribution of Income Tax Returns & Earnings, by Statutory Marginal Bracket

Statutory Marginal Tax Rate	% of Taxpayers Facing Rate	% of Labor Earnings for Taxpayers Facing Rate
0	19.7%	3.8%
10	21.6	7.7
15	36.9	33.8
25	16.5	28.4
28	2.1	6.1
33	0.4	1.8
35	0.4	7.5
Alternative Minimum Tax	2.5	11.0

Source: Congressional Budget Office, Effective Marginal Tax Rates on Labor Income 2005.

Highest Marginal Income Tax Rates on Wage Income, Combined State & Federal, 2010

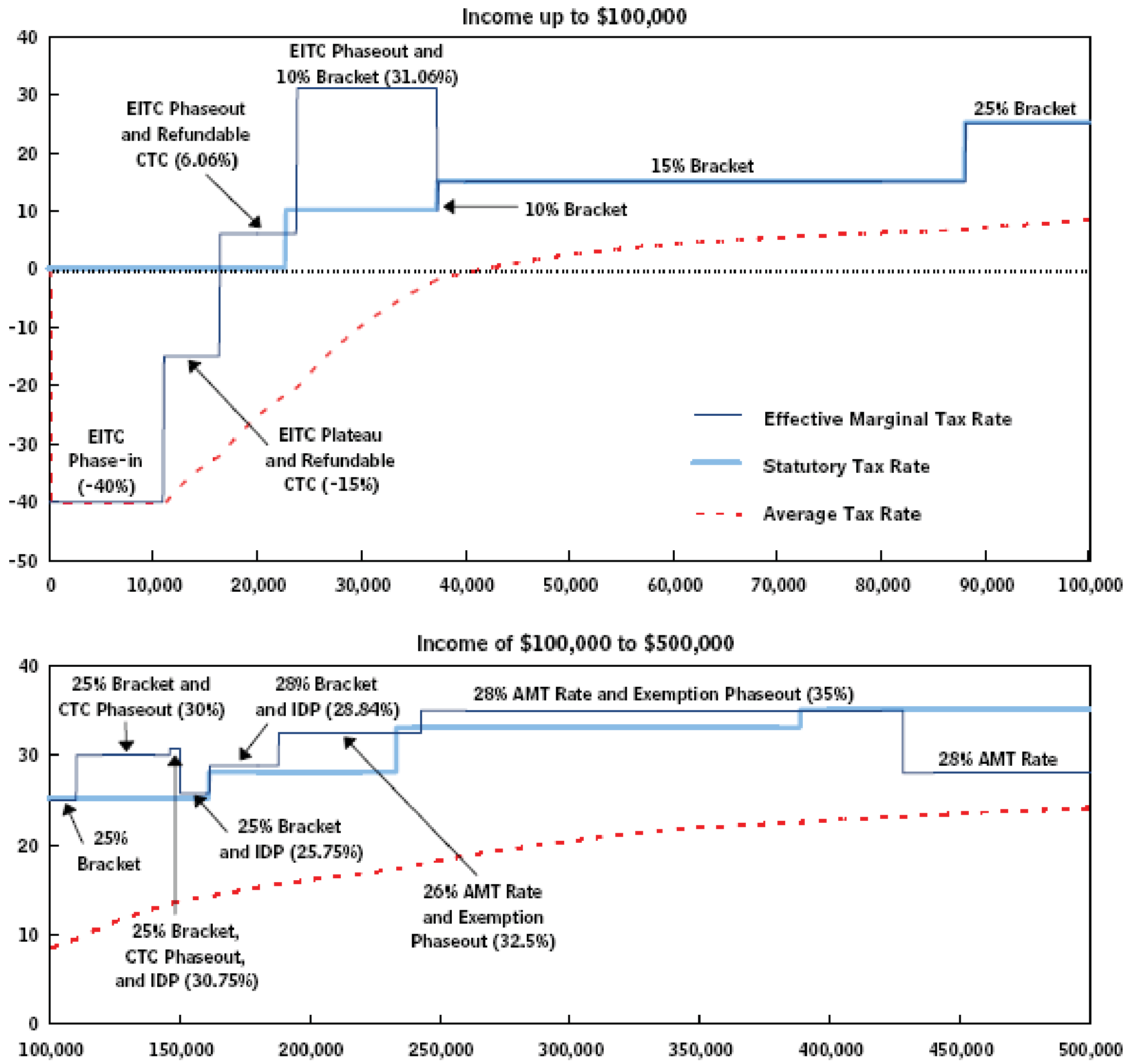
Denmark	56.1%
Belgium	59.4
Sweden	56.5
Finland	55.5
Netherlands	50.1
Italy	50.7
France	49.8
Japan	47.8
Norway	47.8
Switzerland	41.4
Germany	47.5
Ireland	52.1
Australia	46.5
Canada	46.4
United States	43.2
Spain	43.0
U.K.	51.0
New Zealand	35.5
Turkey	35.7
Iceland	44.3
Czech Republic	31.1
Mexico	31.7
Slovak Republic	29.9

Source: OECD reported on Tax Policy Center website.

Figure 4.

Effective Marginal Federal Income Tax Rates for a Married Couple with Two Children in 2005

(Percent)

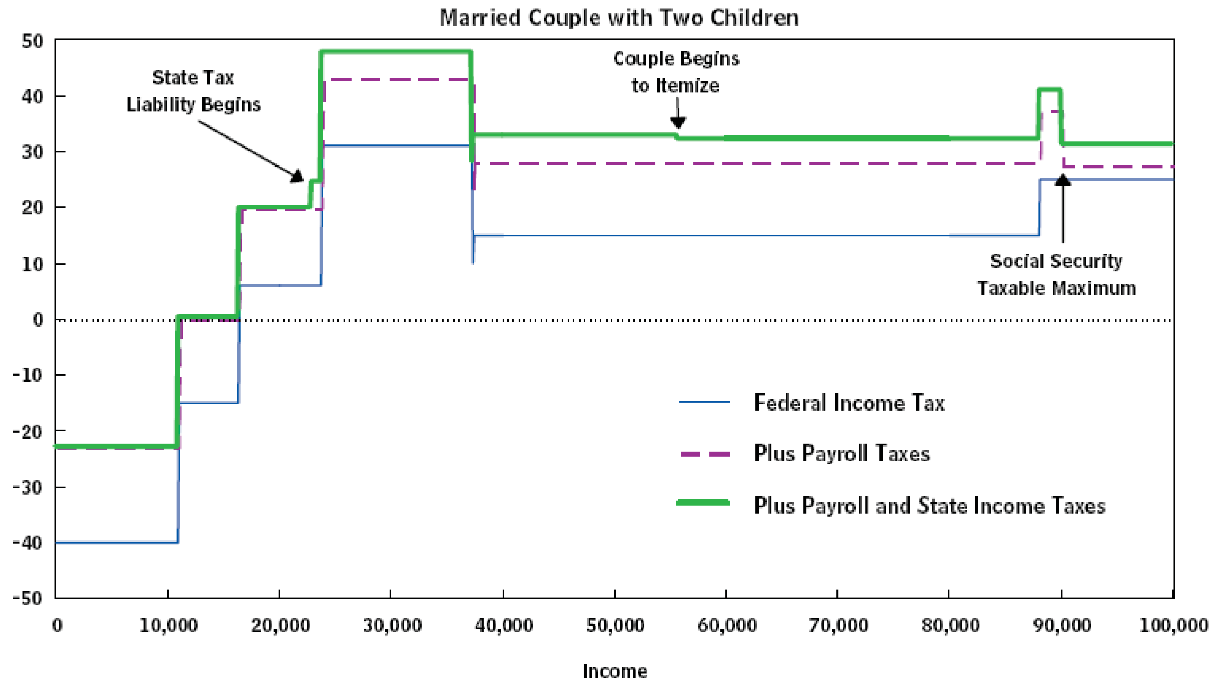


Source: Congressional Budget Office.

Notes: This example assumes that the taxpayers are a married couple filing jointly with two dependents. All of the couple's income is from wages earned by one spouse. The couple has itemized deductions worth 18 percent of income and claims the greater of those deductions or the standard deduction. (Forty percent of the itemized deductions are assumed to be state and local taxes, and the rest are charitable contributions and mortgage interest.)

EITC = earned income tax credit; CTC = child tax credit; IDP = itemized-deduction phaseout; AMT = alternative minimum tax.

(Tax rate in percent)



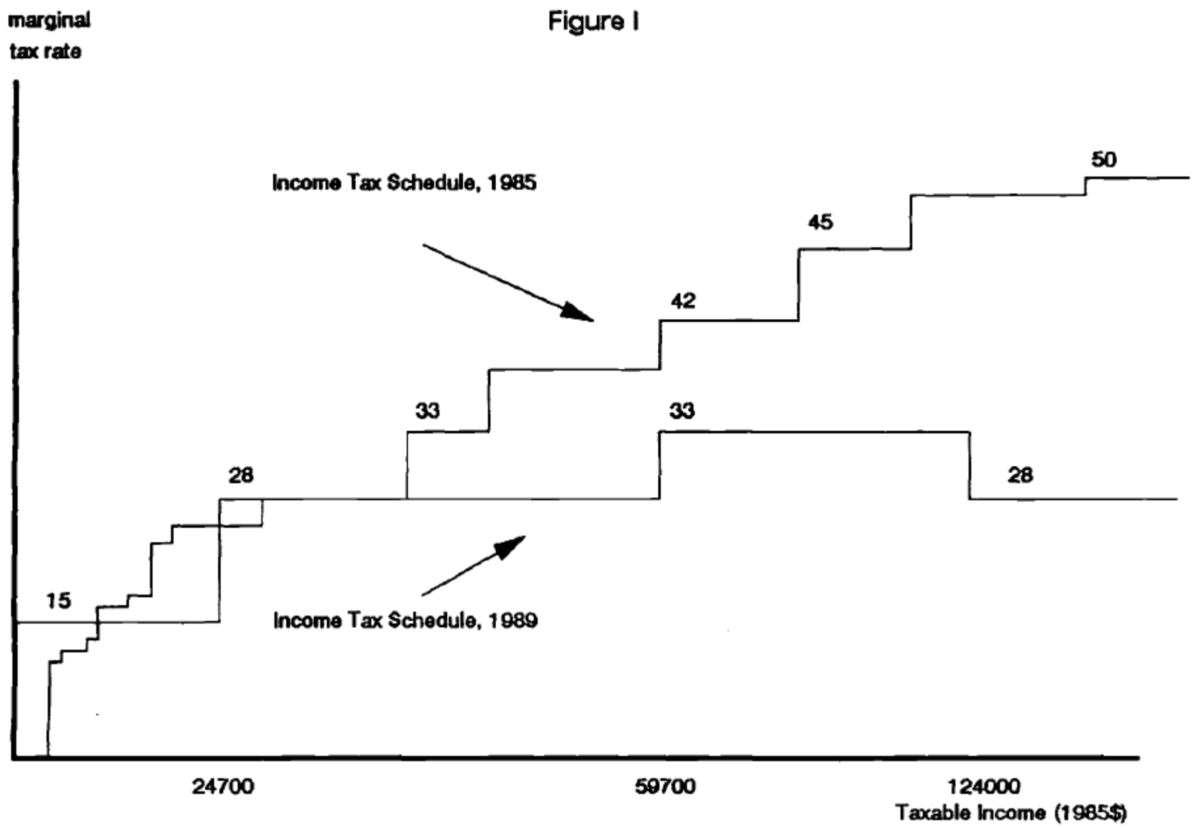
Source: Congressional Budget Office.

Notes: These examples assume that the taxpayers are a single filer with no dependents, a single filer who has one dependent and files as a head of household, or a married couple filing jointly with two dependents. All income is from wages (in the case of the married couple, those wages are earned by one spouse). The taxpayers have itemized deductions worth 18 percent of their income and claim the greater of those deductions or the standard deduction. (Forty percent of the itemized deductions are assumed to be state and local taxes, and the rest are charitable contributions and mortgage interest.)

State taxes are assumed to be 5 percent of federal taxable income.

Marginal rates are computed as a percentage of compensation before the employer's share of payroll taxes has been paid.

Most important tax reform in post-war period: TRA 86



Source: Eissa, 1995 NBER WP – married couple filing jointly

Our Analysis Will Examine a Long-standing Question: How Does Labor Supply Respond to a Tax-Induced Reduction in the After-Tax Wage?

Theory is Inconclusive: Offsetting Income and Substitution Effects in a One-Period Model

Empirical work: estimating labor supply models – need to consider compensated (Hicksian) and uncompensated (Marshallian) wage effects

Let m = leisure and E = endowment of hours so

$l = E - m$.

y_0= non-labor income as above.

Leisure is a normal good: $m = m\left(w, y_0 + wE\right)$

Let $y = y_0 + wE$ denote "full income" inclusive of the value of time endowment. Note that $l\left(w, y_0 + wE\right) = E - m\left(w, y_0 + wE\right)$

<u>Slutsky Equation for Leisure</u>:

$$\frac{\partial m}{\partial w} = \left.\frac{\partial m}{\partial w}\right|_{\overline{u}} - m\frac{\partial m}{\partial y}$$

Since $l = E - m$ and E is fixed, we can write

$$\frac{-\partial l}{\partial w} = \left.\frac{-\partial l}{\partial w}\right|_{\overline{u}} - m\left(\frac{-\partial l}{\partial y}\right)$$

or

$$\frac{\partial l}{\partial w} = \left.\frac{\partial l}{\partial w}\right|_{\overline{u}} - m\frac{\partial l}{\partial y}.$$

In empirical work we estimate $\frac{dl}{dw}$, which (although we cannot separate them) is composed of two terms:

$$\frac{dl}{dw} = \frac{\partial l}{\partial w} + E\frac{\partial l}{\partial y}.$$

When we typically estimate demand models we don't have to worry about the second term, because the consumer does not have an endowment of the good in question.

Substitution from the preceding equation yields:

$$\underset{\substack{\uparrow \\ \text{What we} \\ \text{estimate in} \\ \text{labor supply model}}}{\frac{dl}{dw}} = \left.\frac{\partial l}{\partial w}\right|_{\overline{u}} - m\frac{\partial l}{\partial y} + E\frac{\partial l}{\partial y} = \underset{\substack{\uparrow \\ \text{Compensated} \\ \text{derivative}}}{\left.\frac{\partial l}{\partial w}\right|_{\overline{u}}} + l\,\frac{\partial l}{\partial y} \;.$$

Rearranging terms to solve for the compensated derivative of labor supply with respect to the wage yields:

$$\left.\frac{\partial l}{\partial w}\right|_{\overline{u}} = \frac{dl}{dw} - l\,\frac{\partial l}{\partial y} \;.$$

This equation looks a lot like a Slutsky equation with a flipped sign on the income term - but that's NOT quite the interpretation. We can rewrite this in elasticity terms as:

$$\frac{w}{l} \cdot \frac{\partial l}{\partial w}\bigg|_{\overline{u}} = \frac{w}{l}\frac{dl}{dw} - \frac{w}{l} \cdot \ l \ \frac{\partial l}{\partial y} \quad .$$

$$\boxed{\varepsilon^{w}_{comp} \ = \ \varepsilon^{w}_{uncomp} - \ w\frac{\partial l}{\partial y}}$$

or $\varepsilon^{w}_{comp} = \varepsilon^{w}_{uncomp} - \left(\frac{wl}{y}\right)\eta_y$, where $\eta_y = \frac{y}{l}\frac{\partial l}{\partial y}$.

Historical Perspective:

* Pre-1970, Virtually No Empirical Evidence at Household Level. Dan Holland (MIT Sloan School) conducted surveys of accountants, lawyers, doctors. The results suggest that higher taxes would <u>raise</u> work effect, i.e. that income effect > substitution effect.

* 1970s: Early cross-sectional labor supply models.

$$l_i = \gamma + \alpha w_i + \beta y_i + \varepsilon_i$$

Generally find slightly backwards bending labor supply curve for men - hicksian elasticity around 0.1, income effect around -0.2, marshallian around -0.1

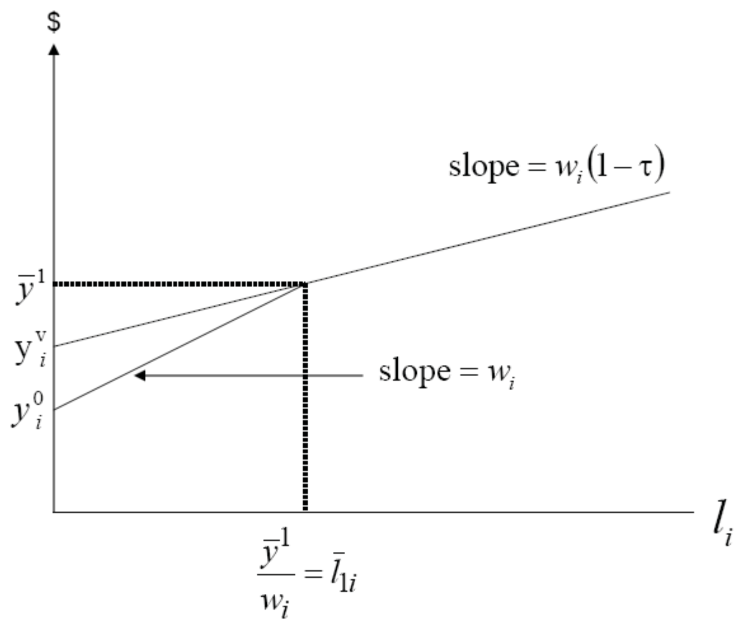
Variety of empirical problems:

- Omitted characteristics correlated with wage and non-labor income - e.g. guys with taste for work have higher wages and higher non-labor income
- Wages aren't even observed for non-workers - selection bias if higher wages bring in those with different taste for work
- Demand side effect on wages - if labor demand isn't percently elastic, then tax cut will lower wages and offset rising labor supply

- Taxes are function of wages and non-labor income, which depend directly on hours - and do so through a non-linear budget constraint
- Measurement error in wages and non-labor income (really want Wealth)
- Doesn't deal with fact that this is a dynamic, not a static decision - time path of tax rates will matter
- Doesn't deal with fact that labor supply decisions are made in a family context

Next generation of studies: impose stochastic structure (normality of errors) and develop MLE approach recognizing the nonlinear budget set

Modeling a Nonlinear Budget Set



Tax schedule: $\tau_i = 0 \text{ if } w_i l_i \leq \bar{y}^1$

$\tau_i = \tau \text{ if } w_i l_i > \bar{y}^1$

$y_i^v =$ "virtual income" and w_i^{AT} = after-tax wage.

Desired Hours: $l_i^* = \gamma + \alpha w_i^{AT} + \beta y_i^v + \varepsilon_i$

Actual Hours: $l_i = 0$ if $l_i^* \leq 0$

$l_i = l_i^*$ if l_i^* falls on a budget facet ("tangency")

Assume that e_i follows a normal distribution with mean zero, standard deviation σ

<u>Four Cases</u>:

i) $l_i^* \leq 0,\ l_i = 0$:

$$\gamma + \alpha w_i + \beta y_{0i} + \varepsilon_i \leq 0$$
$$\varepsilon_i \leq -(\gamma + \alpha w_i + \beta y_{0i}) \equiv -Z_{0i}$$
$$Pr(\varepsilon_i \leq -Z_{0i}) = Pr\left(\frac{\varepsilon_i}{\sigma} \leq \frac{-Z_{0i}}{\sigma}\right) = \Phi\left(\frac{-Z_{0i}}{\sigma}\right).$$

ii) $0 \leq l_i \leq \bar{l}_{1i}$ where $\bar{l}_{1i} = \bar{y}_1 / w_i$;

$$l_i = l_i^* = \gamma + \alpha w_i + \beta y_i^0 + \varepsilon_i$$
$$\varepsilon_i = l_i - Z_{0i}$$
$$Pr(\varepsilon_i = l_i - Z_{0i}) = Pr\left(\frac{\varepsilon_i}{\sigma} = \frac{l_i - Z_{0i}}{\sigma}\right) = \phi\left(\frac{l_i - Z_{0i}}{\sigma}\right).$$

iii) $l_i > \bar{l}_{1i}$

$$l_i = l_i^* = \gamma + \alpha w_i(1-\tau) + \beta y_i^v + \varepsilon_i \equiv Z_{1i} + \varepsilon_i$$
$$\varepsilon_i = l_i - Z_{1i}$$
$$Pr(\varepsilon_i = l_i - Z_{1i}) = \phi\left(\frac{l_i - Z_{1i}}{\sigma}\right).$$

iv) $l_i = \bar{l}_{1i}$ (labor supply at the kink point)

$Z_{0i} + \varepsilon_i \geq \bar{l}_{1i}$ and $Z_{1i} + \varepsilon_i \leq \bar{l}_{1i}$.

Thus $\bar{l}_{1i} - Z_{0i} \leq \varepsilon_i \leq \bar{l}_{1i} - Z_{1i}$

The probability of this outcome is

$$\Pr\left(\frac{\varepsilon_i}{\sigma} \leq \frac{\bar{l}_{1i} - Z_{1i}}{\sigma}\right) - \Pr\left(\frac{\varepsilon_i}{\sigma} \leq \frac{\bar{l}_{1i} - Z_{0i}}{\sigma}\right) = \Phi\left(\frac{\bar{l}_{1i} - Z_{1i}}{\sigma}\right) - \Phi\left(\frac{\bar{l}_{1i} - Z_{0i}}{\sigma}\right).$$

Now we assemble the likelihood function, with N observations, arranged so that

$$\begin{array}{ll} i = l, \ldots N_1 & l_i = 0 \\ i = N_1 + 1, \ldots N_2 & 0 \leq l_i \leq \bar{l}_i \\ i = N_2 + 1, \ldots N_3 & l_i > \bar{l}_{1i} \\ i = N_3 + 1, \ldots N & l_i = \bar{l}_{1i}\ . \end{array}$$

$$L = \prod_{i=1}^{N_1} \Phi\left(\frac{-Z_{0i}}{\sigma}\right) \prod_{i=N_{1+1}}^{N_2} \phi\left(\frac{l_i - Z_{0i}}{\sigma}\right) \prod_{i=N_{2+1}}^{N_3} \phi\left(\frac{l_i - Z_{1i}}{\sigma}\right) \prod_{i=N_{3+1}}^{N_4} \left\{\Phi\left(\frac{\bar{l}_{1i} - Z_{1i}}{\sigma}\right) - \Phi\left(\frac{\bar{l}_{1i} - Z_{0i}}{\sigma}\right)\right\}.$$

$L = L(\alpha, \beta, \gamma, \sigma \,|\{l, w, y, x\})$

Estimate parameters by MLE
Classic Application: Hausman (1981)

Labor Supply of Married U.S. Men, Aged 25-55 in 1975
PSID Data - exclude self employed, disabled
Sample Restrictions: 5862 Men in PSID - 2544 ("poverty sample") - 1071 Single - 793 outside age limits - 437 missing data = 1017 Estimation Sample

Sample Summary Stats:
Mean wage = $6.18 / hour (about $19/hour today)
Mean labor supply = 2.12 (units = thousands hours/year)
Mean non-labor income = 1.27 (thousands dollars/year)

Estimates:

$$l_i = \underset{(0.153)}{2.366} + \underset{(0.011)}{0.011}\, w_i*(1-\tau_i) - 0.153*y^v_i + \text{other covariates}$$

Key empirical finding: small uncompensated wage effect (like prior literature), but large income effect hence LARGE compensated wage elasticity. This drives large estimates of DWL.

General questions about NLBS methods:

1. Don't resolve most of the empirical issues raised above – do deal with direct dependence of taxes on hours, and model measurement error in wages – but fundamental omitted variables bias not addressed.

2. Nonconvexities in budget sets should lead to bunching at kink points – do we see this?

- Saez (2010 <u>AEJ: Policy</u>): mass point at "entry" to income tax system, not at other kink points. Overall, little bunching

- Friedberg (2000 <u>REStat</u>): Social Security earnings test (large change in marginal tax rates for elderly workers, potentially more flexibility in labor supply) → clear evidence of bunching, but small share of folks

- Chetty <u>et al</u>. (2009 NBER 15617): Danish data from individual tax records – see larger bunching around larger kinks – consistent with notion of adjustment costs

FIGURE 3
Income Distribution around the Top Tax Cutoff for Wage Earners

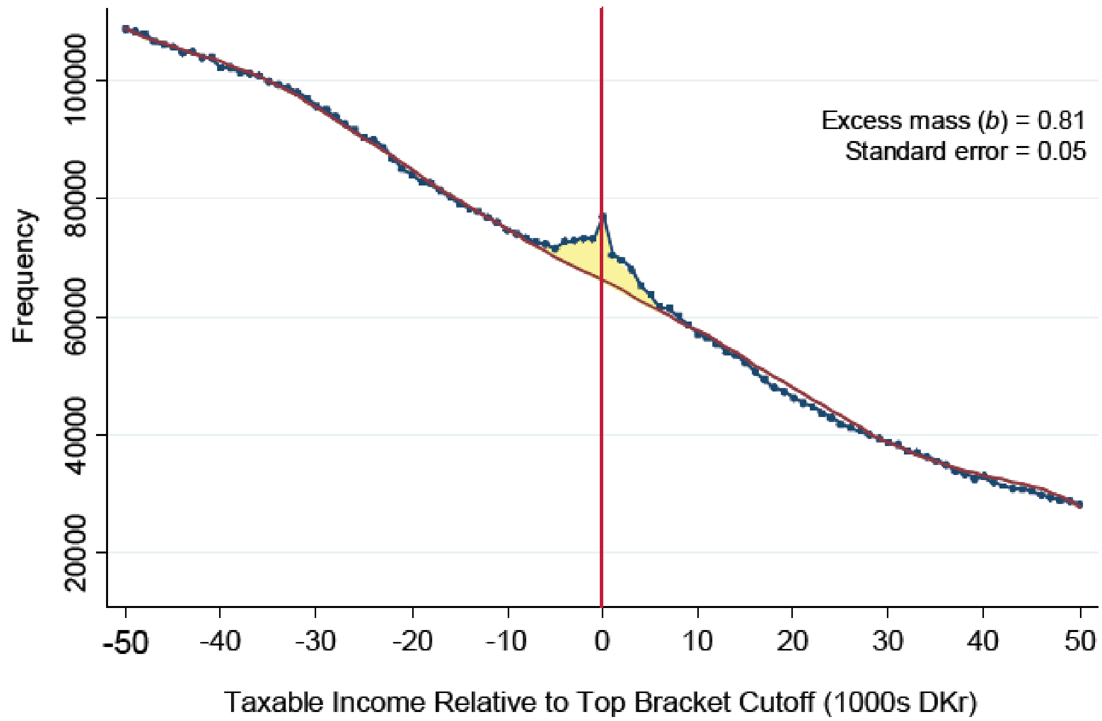
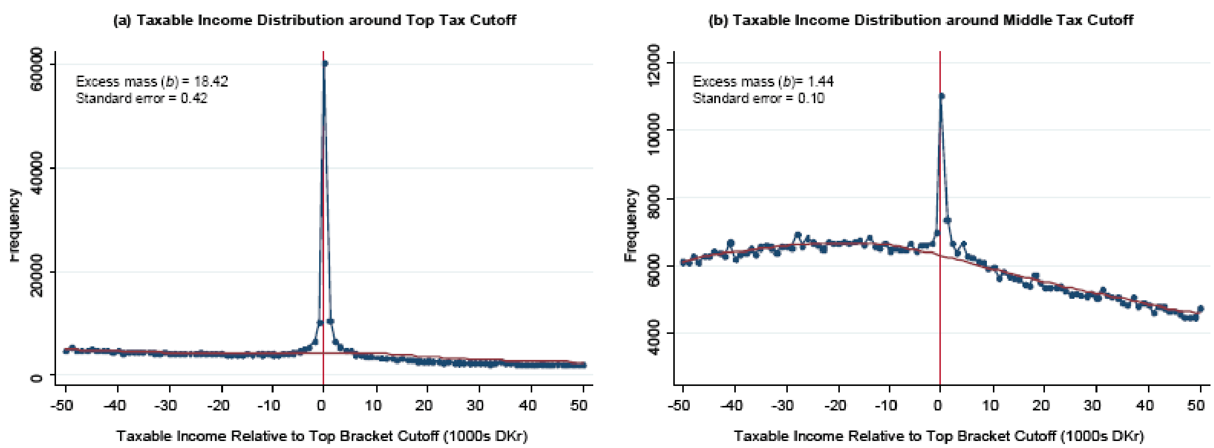


FIGURE 20
Self-Employed Individuals



3. Structural method might actually <u>impose</u> the labor supply response it claims to "estimate"

When the labor supply function is consistent with theory, $\left.\frac{\partial l}{\partial w}\right|_{\overline{u}} > 0$. Recall $\left.\frac{\partial l}{\partial w}\right|_{\overline{u}} = \frac{dl}{dw} - \frac{l\,\partial l}{\partial y} = \alpha - \beta * l$. Structural estimation imposes α - $\beta * l > 0$. Is this a problem?

The key parameter of interest for public finance is *dl/dτ*. This depends in part on how tax rate changes affect virtual income. Virtual income depends on the structure of marginal rates. We can write

$$y_{i,j}^{v} = y_{i,j-1}^{v} + \overline{\ell}_j \cdot \left[w_i\left(1-\tau_{j-1}\right) - w_i\left(1-\tau_j\right)\right]$$

where $\overline{\ell}_j$ is the hours of work at which the individual moves from segment j-1 to segment j of the budget set. It follows that $\frac{dy_{i,j}^{v}}{d\ \ _j} = w_i \overline{\ell}_j$. This implies that

$$\frac{dl_i}{d\ \ _j} = -\alpha w_i + \beta * \frac{dy_{i,j}^{v}}{d\ \ _j} = -\alpha w_i - \beta * (w_i * \overline{\ell}_j) = - w_i\,(\alpha - \beta * \overline{\ell}_j).$$

Since the second term is required to be positive by the theory, <u>by construction</u> the effect of tax rate increases on labor supply must be negative.

Has the NLBS approach, and its imposition of theory, constrained the outcome?

MaCurdy-Hausman controversy: MaCurdy claims that it imposes result, and that in fact get much less elastic labor supply if don't impose this

Most comprehensive review of this question in Eklof and Sacklen (2000).

1) Most of difference between these two has nothing to do with the model and everything to do with measurement – in particular, Hausman uses a real wage measure, while MaCurdy divides income by hours which imposes denominator bias

2) But Hausman's result is really sensitive – likelihood function quite flat – can't really tell apart large and small values

More recent application – Kumar (2008) applies NLBC to studying TRA 86. Corrects limitations of earlier approaches and finds compensated elasticity of 0.22 – TRA 86 raised labor supply by 2% with 10% DWL reduction

Clear limitations to this approach

Where to go from here? Direction #1: Continue to build on structural model to account for omitted issues, in particular dynamic nature of labor supply decisions

Lifetime Utility Function:

$$V_1 = V\left(c_1, c_2, .., c_T;\ l_1, l_2, .., l_T\right)$$

If we assume additive separability this can be written

$$V_1 = \sum_{j=1}^{T} \upsilon\left(c_j, l_j\right).$$

Lifetime Budget Constraint:

$$A_1 + \sum_{j=1}^{T} w_j l_j \left(1+r\right)^{-(j-1)} = \sum_{j=1}^{T} c_j \left(1+r\right)^{-(j-1)}.$$

A_1 denotes asset endowment at start of life. The trajectory of wages, $\{w_j\}$ is treated as exogenous. Under additive separability, the problem becomes

$$\max_{\{c,l\}} \sum_{j=1}^{T} \upsilon\left(c_j, l_j\right) + \lambda\left\{A_1 - \sum_{j=1}^{T} \left(c_j - w_j\, l_j\right)\left(1+r\right)^{-(j-1)}\right\}$$

where λ is the shadow value of wealth in the lifetime budget constraint. Note that

$$\lambda = \lambda\left(w_1, \ldots w_T, r, A_1\right).$$

Key econometric challenge - can we remove λ with a fixed effect or do we need to model it?

First order conditions for consumption and labor supply choice are:

$$\upsilon_{c_j} - \lambda(1+r)^{-(j-1)} = 0$$

$$\upsilon_{l_j} + \lambda w_j (1+r)^{-(j-1)} = 0$$

These two conditions imply a familiar first order condition for labor supply choices in each period:

$$\upsilon_{l_j} = -w_j \, \upsilon_{c_j} .$$

This yields a relationship between current consumption, current labor supply, and current wages.

How does the compensated wage elasticity from the one-period model generalize to this setting? It becomes the elasticity of this-period hours with respect to this-period wages <u>holding constant λ</u>. This is known as the <u>Frisch</u> labor supply elasticity - it holds the marginal utility of wealth constant.

The lifecycle framework lets us distinguish three types of wage changes that could affect the current period:

i) immediate and permanent increase in after-tax wage
ii) increase in current after-tax wage but no change in future after-tax wages
iii) increase in wage that is part of an anticipated lifetime wage-age trajectory

This framework enables us to analyze future tax changes - how does the expectation of higher tax rates in 2011 (hence lower after-tax wages) affect <u>current</u> hours of work.

Full solution for $dl_t/d\{w_t(1-\tau_t)\}$ requires solving for effect of the after-tax wage on λ.

Existing problems with this approach are exacerbated by extra parameter to estimate AND fact that data requirements are much higher when you are trying to model dynamics.

Moreover, data restrictions lead to use of tiny samples (500 workers or less) that lead to sensitive results.

Best work on this: Ziliak and Knieser (1999)

They find compensated elasticity of 0.15 – tax elasticity (uncompensated) is -0.06.

Project that major tax reforms of early 1980s (with top rate falling from 70% to 28%) raised labor supply by 3%

Yet the intertemporal distortions are so large that DWL is even larger than Hausman – TRA 86 lowered DWL by 16%

Refreshingly honest in highlighting the sensitivity of the results to specification choices – not surprising given demanding model and small sample

Also, still doesn't deal with perhaps the most fundamental dynamic issue: estimating impact of taxes on human capital accumulation.

Keane (2011) reviews attempts to incorporate dynamics and human capital but the identification is daunting.

Raises the question of how far we can push an integrated structural model

Direction #2: Natural experiment approach

Eissa (NBER WP 5023, 1995)
Focus on labor supply of married women:

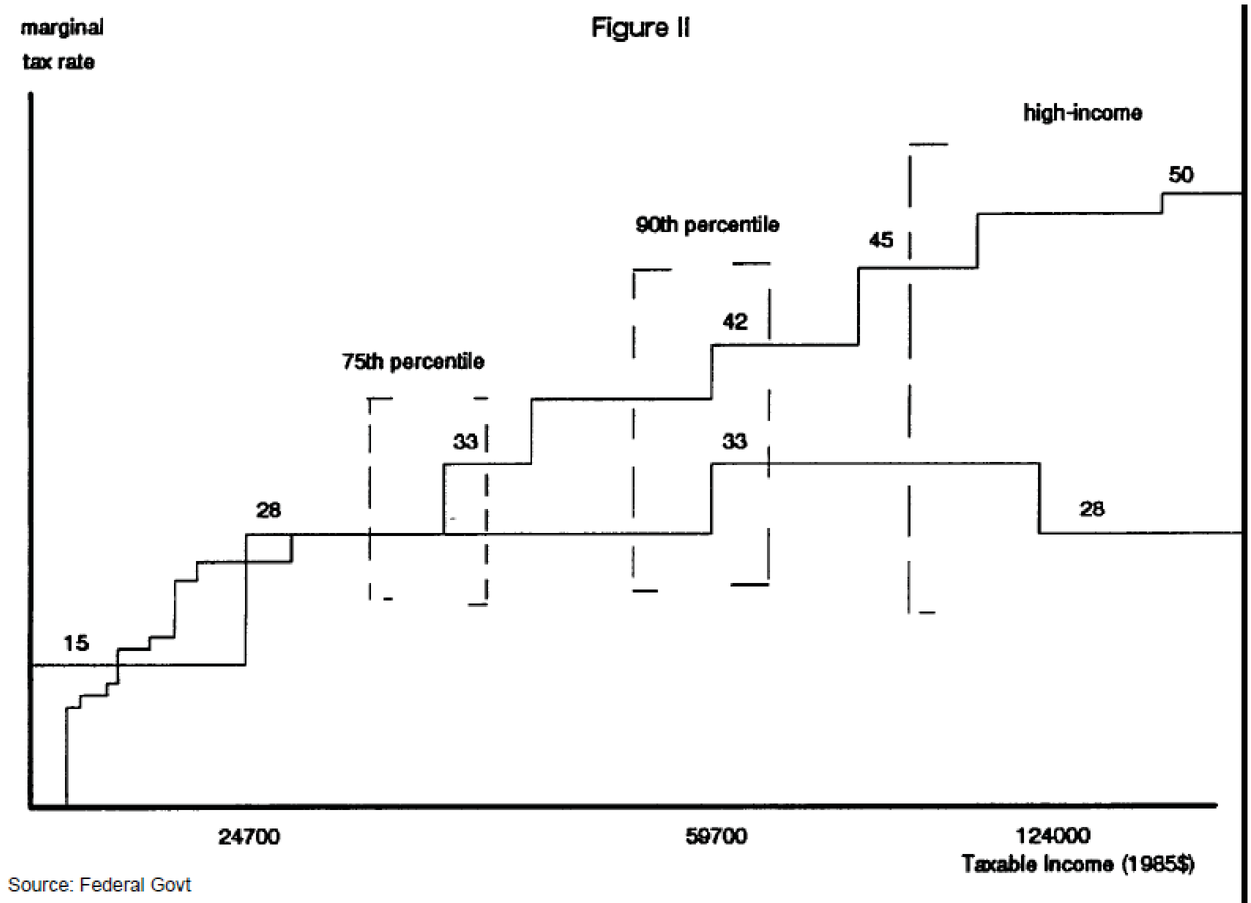
Key differences from studying married men:

i) participation margin ("extensive margin") is important: LFPR ≈ 70%

ii) gross wage much larger than net wage (child care costs, high marginal tax rate because income is added to husband's income)

iii) family decision - may need to include husband's attributes, aspects of family such as number and ages of children

Change in Tax Schedule from 1986 Tax Reform Act:



Estimation strategy: Control (c) and Experimental (e) Groups. Larger Tax Changes for (e) than (c) Group. Consider both Participation (Extensive Margin) and Hours Conditional on Employment (Intensive Margin):

Group \ Period	Pre-TRA86	Post-TRA86
Husbands Earning in 99th Percentile (e)	$l_{e,\ pre}$	$l_{e,\ post}$
Husbands Earning Near 75th Percentile (c)	$l_{c,pre}$	$l_{c,post}$

Differences-in-Differences Estimator:

Δ in $\Delta = (l_{e,\ post} - l_{e,\ pre}) - (l_{c,\ post} - l_{c,\ pre})$

Note estimation can proceed by allowing four (exhaustive) indicator variables and no intercept:

$$l_{i,t} = X_{i,t}*\beta + \theta_1*I\{e,pre\}_{i,t} + \theta_2*I\{e,post\}_{i,t}$$

$$+\theta_3*I\{c,pre\}_{i,t}+\theta_4*I\{c,post\}_{i,t} + \varepsilon_{i,t}$$

where i denotes household, t denotes observation year

Δ in $\Delta = (\theta_2 - \theta_1) - (\theta_4 - \theta_3)$.

Size of Tax Shock: Change in After-Tax Wage Due to Tax Reform: + 29.1% at 99th Percentile, +12.3% at 90th Percentile, + 6.5% at 75th Percentile

Data: March CPS 1984-86 ("pre") and 1990-92 ("post"), Married 20-64, not self employed, husband employed
Experimental Group: 1474 women with husband earnings > 99th percentile

Labor Force Participation Rate:

Group \ Period	Pre-TRA86	Post-TRA86
Husbands Earning in 99th Percentile (e)	0.464 (0.018)	0.554 (0.018)
Husbands Earning Near 75th Percentile (c)	0.687 (0.010)	0.740 (0.010)

Δ in Δ = 0.037 (0.028)   12.3% increase in LFPR

Average Hours

Group \ Period	Pre-TRA86	Post-TRA86
Husbands Earning in 99th Percentile (e)	596 (32)	801 (35)
Husbands Earning Near 75th Percentile (c)	1033 (15)	1155 (15)

Δ in Δ = 85 (52)   23% increase in average hours
(note: 9.4% increase in hours conditional on participation)
Implies Participation Elasticity of about 0.4, Hours Elasticity of about 0.60
(larger than comparable estimates for men)

Best approach: marry natural experiments & structural modeling

Blundell, Duncan and Meghir (1998) – study labor supply of women during period of tax reforms in the UK

They extend Eissa in three ways:

1) Test for composition effects that might bias DD estimates using observables – form a specification check

2) Introduce income effects by using the fact that the tax reforms changed tax treatment of non-labor income at the same time

3) Consider heterogeneity across types of women

But they also impose much more structure

1) Look only at workers – have to model the selection into the labor force with structural methods

2) Structurally model the selection that arises from just choosing guys on segments, rather than modeling NLBC

They do explore sensitivity – open issue if they get it right

TABLE IV

ELASTICITIES: GROUPING INSTRUMENTS: COHORT AND EDUCATION

	Wage	Compensated Wage	Other Income	Group Means: Hours	Group Means: Wage	Group Means: Income
No Children	0.140	0.140	0.000	32	2.97	88.63
	(0.075)	(0.088)	(0.041)			
Youngest Child 0–2	0.205	0.301	−0.185	20	3.36	129.69
	(0.128)	(0.144)	(0.104)			
Youngest Child 3–4	0.371	0.439	−0.173	18	3.10	143.64
	(0.150)	(0.159)	(0.139)			
Youngest Child 5–10	0.132	0.173	−0.102	21	2.86	151.13
	(0.117)	(0.127)	(0.109)			
Youngest Child 11 +	0.130	0.160	−0.063	25	2.83	147.31
	(0.107)	(0.117)	(0.084)			

Note: Asymptotic standard errors in parentheses.

General conclusion from labor supply literature: fairly inelastic for men, more elastic for women, especially with kids

Makes sense: women have more options (higher substitution effect) and smaller income effect (since less initial participation)

But this may be changing: Blau and Kahn (2007)

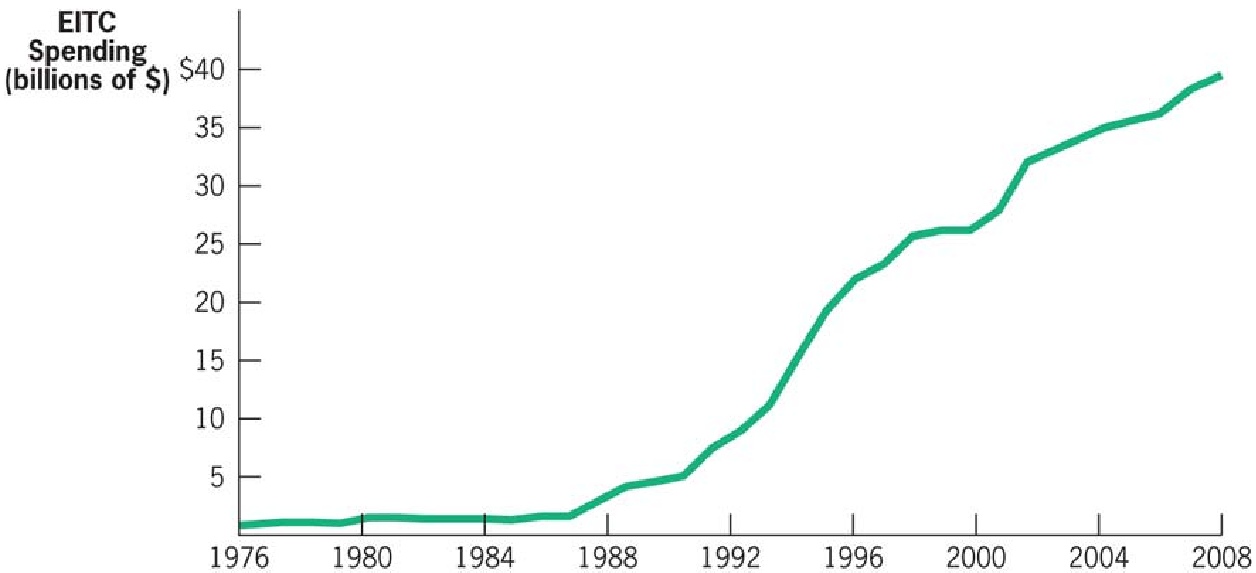
Repeated Cross-section models for labor supply of married women, March CPS, 1979-81, 1989-91, 1999-01. No allowance for taxes on wages. Key finding: <u>declining</u> elasticity of hours w.r.t. wages over time:

1980: 0.77-0.88
1990: 0.58-0.64
2000: 0.36-0.41

Hypothesis: Labor force behavior of women is becoming more like that of men (declining uncompensated wage elasticity).

Another Setting with Large Changes in Marginal Tax Rates: EITC

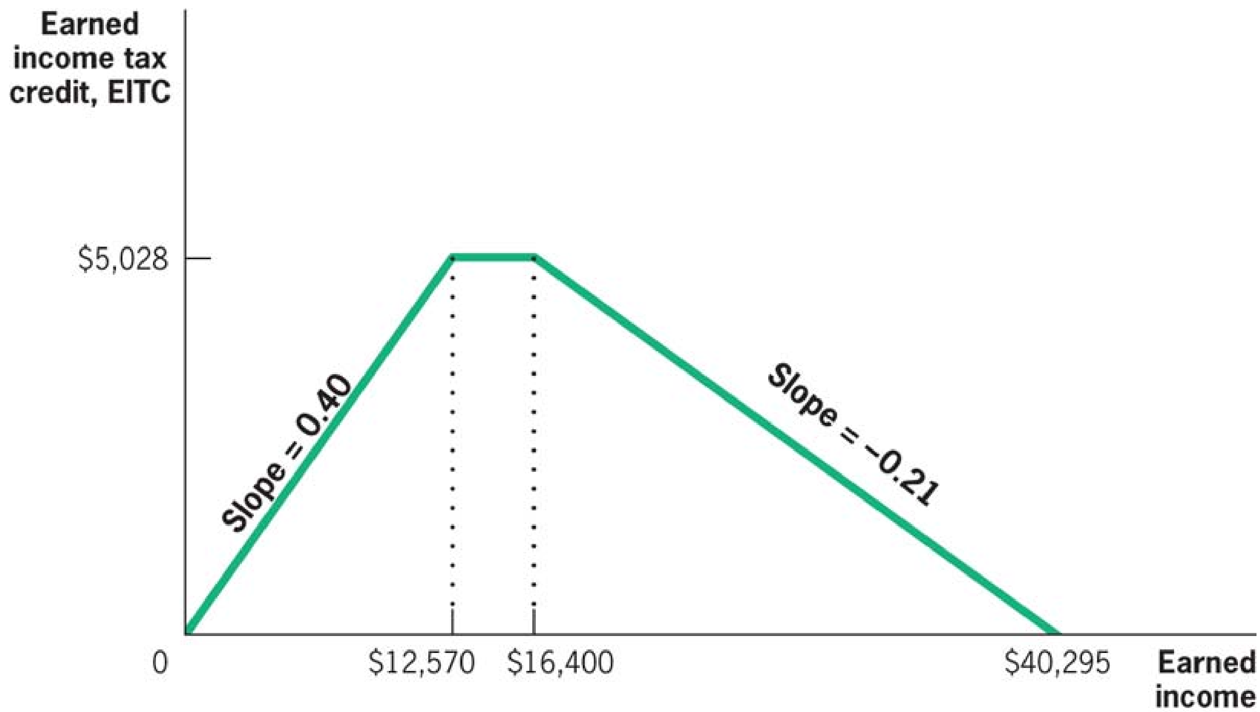
The EITC was introduced in 1976 and has grown tremendously over time



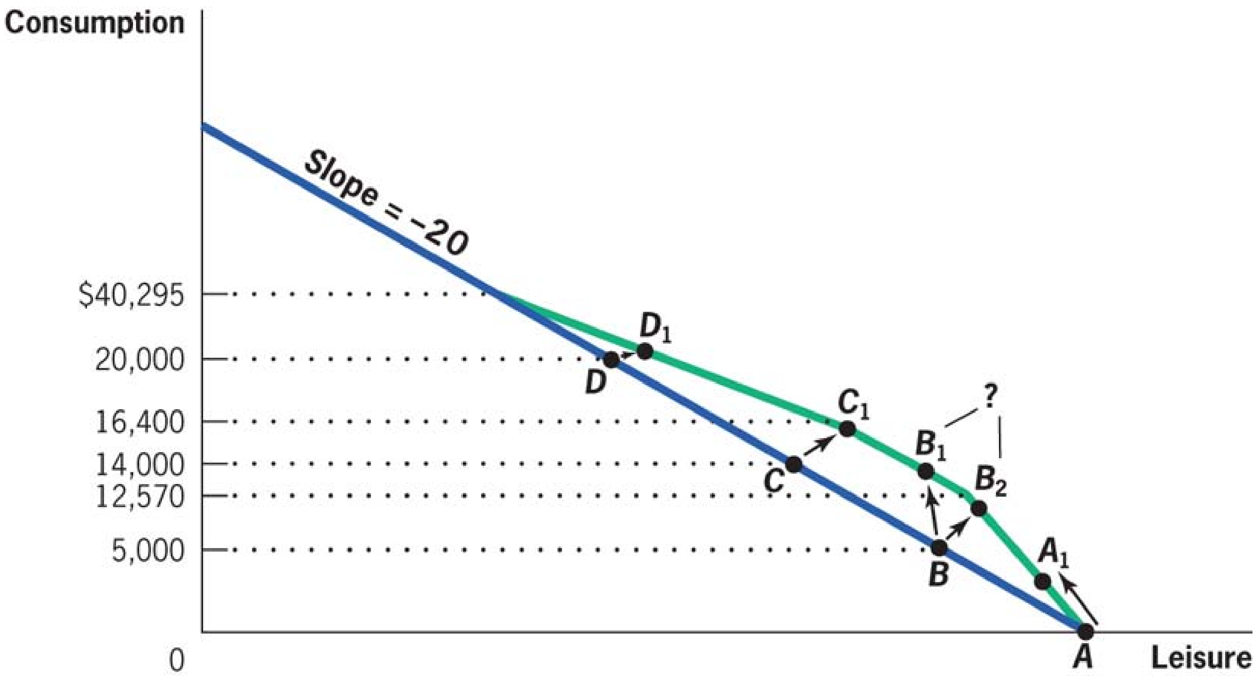
■ FIGURE 21-4
The Growth of the Earned Income Tax Credit • The EITC program has grown from less than $1 billion in 1976 to over $41 billion today. Numbers are measured in current dollars.

The federal government now spends $41.5 billion annually on the EITC, making it the nation's single largest cash anti poverty program.

Structure of the EITC for single earner with two children:



Theory – show impact on budget constraint for earner at $20/hour



1. For people not in the labor force at all (A) – substitution effect, no income effect

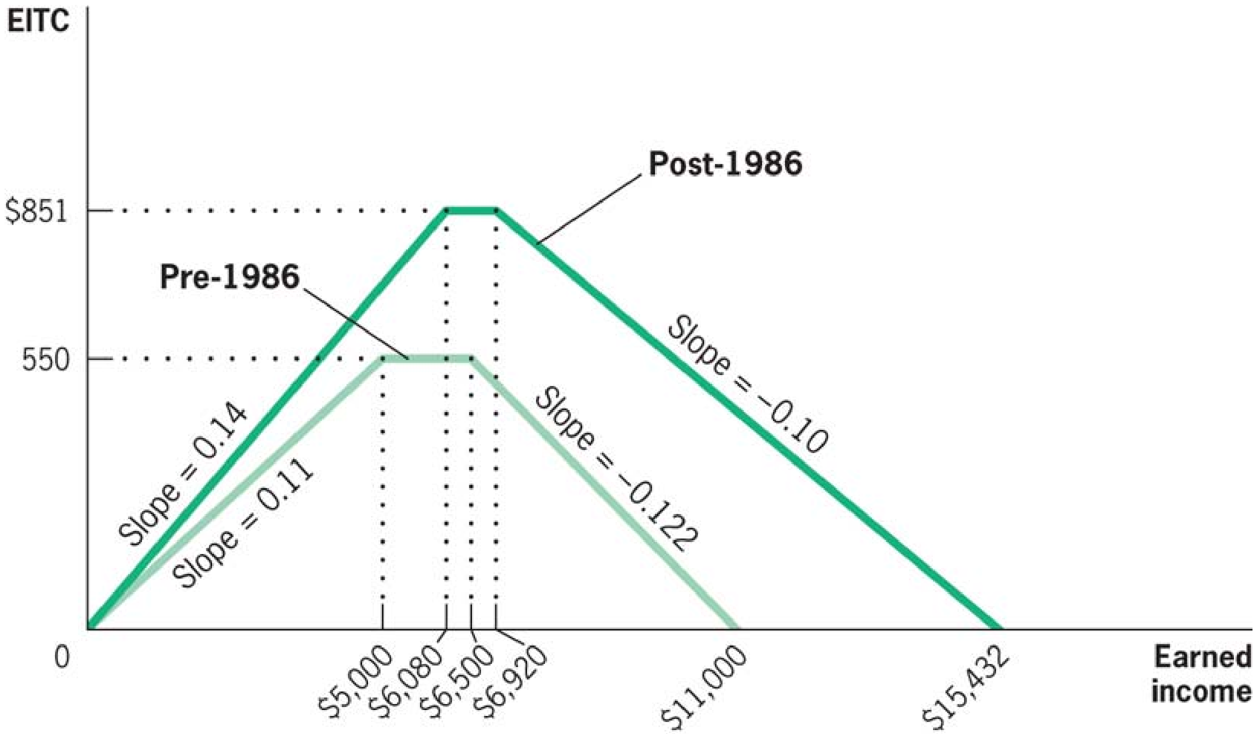
2. People already in the labor force who earn less than $12,570 (B): substitution effect with offsetting income effect

3. People already in the labor force and earning between $12,570 and $16,400 (C) – income effect only

4. People already in the labor force earning between $16,400 and $40,295 (D) – both substitution and income effect lead to less work

Impact of EITC on Labor Supply: Evidence

Sharp changes in taxation from reforms to the EITC



Ambiguous theoretical predictions

Eissa and Leibman (1996): compared single moms with kids to single moms without kids (who couldn't get the EITC back then) – found large rise in LFP

Problem: other differential trends

Eissa & Leibman: show results are focused on low education groups that benefit from EITC

Meyer & Rosenbaum: use 1993 expansion, which was larger for families with 2+ kids than for families with one kid – more plausible that other trends did not differ by family size

Overall review: Eissa & Hoynes (2005) – consistent positive effects on labor force participation – and no consistent impact on hours of work, despite large marginal tax rates

Why is this? Could be lack of understanding

Test in Chetty & Saez (2009) – overall, little effect of providing info through intervention, although heterogeneity across tax providers – some do induce bunching at kinks

What about married couples? Same analysis for primary earner – but for secondary earner, almost always at phase out (since computed on total family earnings)

Eissa & Hoynes: no effect on mens work, but do see a modest decline for married women

EITC Policy issues (Furman, 2006):

1) Very small EITC for childless workers – why not extend?

2) Stops growing after two kids - poverty rate for those with one or two children is about 12%, it rises to over 20% for those with three children, and almost 35% for those with four children.

3) Marriage penalty – since EITC computed on joint income – could raise EITC for married couples, or could use income splitting

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