The Effect of Taxation on Labor Supply, Education and the Acquisition of Skills in the Workplace

Testimony by James J. Heckman to the President's Advisory Panel on Federal Tax Reform

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- I laud the efforts of this panel to examine the tax system and consider where it should be reformed.
- Today, I have been asked to address the issue of the effect of taxation on labor supply, education and the acquisition of skills in the workplace.
- I want to make a few basic points.

- As a matter of both fact and theory, incentives matter.
- Taxes which reduce the incentives to work or to acquire skills reduce work or the acquisition of skills.
- At issue is how important these incentives are empirically.

In thinking about these matters it is important to have a clear understanding of four points:

The panel needs to:

A. Develop a comprehensive view of work and skills

B. Measure the full range of incentives facing persons and firms, recognizing the variety of government programs that agents face and the variety of forms of compensation (wages, pensions, health care and stock options). One needs to develop the full tax rate net of all tax and transfer programs on the entire compensation package

C. Recognize the interdependence of economic choices and incentives People can substitute

D. Understand the effects of large scale policy on prices, wages and incentives

("General Equilibrium" effects)

A. Concepts of Labor Supply

(1) Hours worked by workers

(2) Intensity of effort

(3) Entry and exit of people into the workforce (labor force participation)

(4) Entry and exit of people in the labor force into and out of employment and unemployment (unemployment rate)

(5) Choices of skills

- Education
- Training on the job (learning by doing and job training)
- Searching to find a new job

(6) Choice of location and region

- These different dimensions of labor supply respond differently to incentives.

- There are both short run and long run responses, and one must carefully distinguish these in assessing policies.
- Immobility in the short run that produces little responsiveness due to costs of switching status gives way to flexibility and responsiveness in the long run when incentives are maintained.

- There are many margins of adjustment, and some dimensions of labor supply are more responsive than others.

B. Direct Incentives

- In investigating the strength of responses to incentives, it is important to measure the full array of incentives confronting people in making their choices.
- Not a trivial task.

- There are both wage and non-wage components of taxation, and some are easier to hide from taxation than others
- Need to know components of government policy on labor supply, broadly defined (income taxes, payroll taxes, EITC, tax treatment of pensions and 401K plans, unemployment benefits)

(1)Income taxes: Reduce after-tax wages, reduce incentives to work and reduce participation in the market. Shift compensation toward untaxed payment in kind

(2) Progressive income taxes: Reduce return to investment in skills. Such investments increase earnings, move people into higher tax brackets. Opportunity wages in unskilled jobs are taxed at a lower rate. Such taxation reduces the incentive to acquire skills.

(3) Payroll taxes: Reduce the benefit from working. Depending on the elasticity of labor supply, raise the cost of labor to firms and reduce employment

(4) EITC: Raise incentive to work but may reduce extra work by workers

(5) Welfare and Disability

- These are obvious direct effects of income and payroll taxation on labor supply and employment.
- But there are important indirect effects that are more subtle, but which have been shown to be empirically important.
- They arise from the interdependence of economic choices.

C. Interdependence of Choices and Substitution Policies

- People can substitute among activities
- Just like employers can substitute among forms of compensation
- Example: Raise unemployment or disability benefits relative to wages, people will substitute toward unemployment or disability (well-documented)

- Some goods are complements with work
- An example is housing
- Increasing deductibility of mortgage interest promotes work
- It also affects the costs of college for children. If mortgage interest is deductible, it reduces costs of borrowing and college attendance for those who itemize (e.g., the affluent)

- Raising the borrowing cost of funds through tax and subsidy policy reduces investments in skills, which require an initial up-front investment
- More generally, capital markets, consumption goods markets and labor markets are linked
- Efforts to make men pay child support are a tax on marriage and cause men to leave their families

- Tax policy (incentive policy) in one market affects outcomes in other markets
- Again the strength of these effects is an empirical question
- A full accounting of policy incentives has to examine these linkages
- It also has to examine the large scale consequences of policies

D. Large Scale Effects

- The effects of a change in a national policy that affects the amount of labor supply and the supply of skill also affects prices and wages.
- Thus, a policy that promotes work effort will tend to drive down the hourly wage rates of those who work by making supply of labor in the market more abundant.

- One must recognize these effects to fully assess the effect of a tax policy
- A national policy that subsidizes college attendance reduces the wages of college graduates compared with those of high school graduates by making college graduates more abundant.

- A policy that reduces taxation on capital can raise wages by making capital more abundant.
- Capital and labor are complements.

Empirical Evidence

- It has been claimed that labor supply is relatively inelastic (does not respond to wages or taxes).
- This claim is misleading.
- Seems to be true for one dimension of labor supply: hours of work for workers (male and female). That is a short run effect.

- There is much evidence of high elasticity of response to wages and taxes at margins of entry and exit into and out of employment.
- Especially strong for low wage workers (EITC: e.g., Meyer and Rosenbaum)
- This has implications for reforms in tax and transfer policies at the bottom of the skill distribution.
- For intertemporal labor supply, estimates are substantial (people substituting over time; the Iceland zero-tax experiment).

- Aggregate labor supply is driven by entry and exit and is highly wage elastic and tax elastic
- A substantial part of the effect of taxes on labor supply operates through the effects of deductibles
- See Triest on housing prices
- See Table 1 (prepared by Martin Ljunge) for estimates on a number of dimensions of labor supply

Table 1A

Labor Supply (Hours Worked): Women

Author (date)	Data (years)	Experiment	Sample	Margin	Elasticity		
					Uncompensated	Income	Compensated
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rosen (1976)	Survey of Work Experience (1976)	Cross-section	Married	Hours	2.3		
Cogan (1980)	PSID (1976)	Cross-section	Married	Hours	2.45		
Heckman (1980)	Survey of Work Experience (1976)	Cross-section	Married	Hours	2.23	-0.09	
Heckman and MaCurdy (1982)	PSID (1968-75)	Life cycle	Married	Leisure demand (Hours worked)			-0.41 (1.61)
Arrufat and Zabalza (1986)	British General Househols Survey (1974)	Cross-section	Married	Total Participation Hours if >0	2.03 1.41 0.62	-0.20 -0.14 -0.06	
Triest (1990)	PSID (1983)	Cross-section	Married	Full sample Workers only	0.97 0.28	-0.33 -0.17	
Bourgiugnon and Magnac (1990)	French Labor Force Survey (1985)	Cross-section	Married	 w/ fixed costs	1 0.05	-0.3 -0.2	
van Soest, Woittiez, and Kapteyn (1990)	Dutch Strategic Labor Market Survey (1985)	Cross-section	Married	Total Participation	0.66 0.56	-0.23	

Labor Supply (Hours Worked): Women, continued

Author (date)	Data (years)	Experiment	Sample	Margin	Elasticity Uncompensated	Income	Compensated
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Blomquist and Hansson-Brusewitz (1990)	Swedish Level of Living Survery (1981)	Cross-section	Married	Linear labor supply	0.79	-0.24	
Eissa (1995)	CPS (1983-85 and 1989-91) TRA 86	99th %tile vs. 75th %tile	Married	Participation Hours	0.4 0.8		
Blundell, Duncan, and Meghir (1998)	UK Family Expenditure Survey (1978-1992)	Tax reforms	Married and cohab	No children Child 0-2 yrs Child 3-4 yrs Child 5-10	0.14 0.2 0.37 0.13	0 -0.19 -0.17 -0.1	0.14 0.3 0.43 0.17
Meyer and Rosenbaum (2001)	CPS (1984-1996)	EITC and more	Single mothers 19-44yrs	Tax effects	weekly emp. up 4.4% annual emp. Up 7%		Smaller effects in the 90's

Source: Martin Ljunge (2005)

Table 1B

Labor Supply (Hours worked): Men

Author (date) (1)	Data (years) (2)	Experiment (year) (3)	Sample (4)	Margin (5)	Elasticity Uncompensated (6)	Income (7)	Compensated (8)
Lucas and Rapping (1970)	US Aggregate male and female hours (1929-1965)	Time series	Men & Women	Aggregate Short run			1.40
Hausman (1981)	PSID (1975)	Cross-section	Married	Linear labor supply, hours	0.03	-1	
MaCurdy (1981)	PSID (1967-1976)	Life cycle	Married	Intertemporal labor supply			0.15
Altonji (1986)	PSID (1968-1981)	Life cycle	Married	Intertemporal labor supply			0.17
Blundell and Walker (1986)	British Family Expenditur Survey (1980)	Cross-section	Married		0.024	-0.29	
MaCurdy, Green and Paarsch (1990)	PSID (1975)	Cross-section	Married	Linear labor supply, hours	0	-0.01	
Triest (1990)	PSID (1983)	Cross-section	Married	Linear labor supply, hours	0.05	0	
Bourgiugnon and Magnac (1990)	French Labor Force Survey (1985)	Cross-section	Married	Linear labor supply, hours	0.1	-0.07	
van Soest, Woittiez, and Kapteyn (1990)	Dutch Strategic Labor Market Survey (1985)	Cross-section	Married	Linear labor supply, hours	0.12	-0.01	

Labor Supply (Hours worked): Men, continued

Author (date)	Data (years)	Experiment (year)	Sample	Margin	Elasticity		
					Uncompensated	Income	Compensated
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Blomquist and Hansson Brusewitz (1990)	Swedish Level of Living Survery (1981)	Cross-section	Married	Linear labor supply, hours	0.08	-0.01	
Blomquist, Eklof, and Newey (2001)	Swedish Level of Living Survery (1973, 1980, 1990)	Cross-sections	Married	Hours	0.08	-0.04	
Bianchi, Gudmundsson, and Zoegea (2001)	Statistics Iceland Panel (1986-1988)	Tax reform untaxed year		# weeks worked	up 6%		

Source: Martin Ljunge (2005)

- A new literature on tax responsiveness shows that reported income is sensitive to taxes.
    - People itemize and take deductions
    - People adjust in other dimensions
    - Form of compensation adjusts (less use of hard-to-tax in-kind payments)

Table 1C: Taxable Income Response

Income responses to marginal tax rates

Author (date) (1)	Data (years) (2)	Tax reform (year) (3)	Income Controls (4)	Income definition (5)	Elasticity (6)
Feldstein (1995)	NBER tax panel (1985 and 1988)	TRA 86	None	AGI Taxable Income	.75-1.3 1.1-3
Goolsbee (1998)	Panel of corp. exec. (1991-1994)	OBRA 93	Average Income	Wage, Bonus, Stockoption	Short run: 1 Long run: 0.1
Auten and Carroll (1999)	Treasury tax panel (1985 and 1989)	TRA 86	Log Initial Income	Gross Income Taxable Income	0.73 0.53
Goolsbee (1999)	Tax Statistics Tables (1922-1989)	Various	None	Taxable income	-1.3 to 2 dep. on reform
Gruber and Saez (2002)	NBER tax panel (1979-1990)	ERTA 81 TRA 86	Income group effects	Broad Income Taxable Income	0.12 0.40
Non-US evidence (Single filing systems)					
Sillamaa and Veall (2001) Canada	Statistics Canada Panel (1986 and 1989)	1988	Log Initial Income	Labor Income Taxable Income	0.22 0.14
Aarbu and Thoresen (2001) Norway	Statistics Norway Panel (1991 and 1994)	1992	Initial Income	Taxable Income	0.21 or less
Bianchi, Gudmundsson, and Zoegea (2001) Iceland	Statistics Iceland Panel (1986-1988)	1987 untaxed year	None	# weeks worked Labor Income	up 6% up 12%
Ljunge and Ragan (2005) Sweden	Statisitics Sweden Panel (1989-1994)	1990/91	Initial Income Avg. tax rate	Labor Income	0.35

Samples: Generally working age population with some amount of positive earnings who don't change marital status

Source: Martin Ljunge (2005)

- Table 2 shows effects of three revenue-neutral tax reforms.
- Flat tax reform for income tax has little effect on labor supply and skills.
- If anything, it discourages work by raising the tax on the least skilled who are most wage and tax elastic.
- Consumption tax raises capital accumulation and raises wages.

Table 2

Comparison of Steady States Under Alternative Tax Regimes
Percentage Difference from Progressive Case†
Partial / General Equilibrium

	Flat Tax‡		Flat Consumption Tax‡	
	P.E.	G.E.	P.E.	G.E.
After Tax Interest Rate	0.00%	1.96%	17.65%	3.31%
Interest Rate	0.00%	1.96%	0.00%	-12.18%
Skill Price College HC	0.00%	-1.31%	0.00%	3.38%
Skill Price HS HC	0.00%	-0.01%	0.00%	4.65%
Stock of Physical Capital	-15.07%	-0.79%	86.50%	19.55%
Stock of College HC	22.41%	2.82%	-15.77%	1.85%
Stock of HS HC	-9.94%	0.90%	1.88%	0.08%
Stock of College HC per College Graduate	3.04%	2.55%	-4.08%	1.72%
Stock of HS HC per HS Graduate	1.84%	1.07%	-5.23%	0.16%
Fraction attending college	18.79%	0.26%	-12.18%	0.13%
Aggregate Output	-0.09%	1.15%	15.76%	4.98%
Aggregate Consumption	-0.08%	0.16%	7.60%	3.66%
Mean Wage College	3.39%	2.60%	0.12%	6.96%
Mean Wage HS	2.44%	2.44%	0.25%	6.82%
Standard Deviation Log Wage	4.09%	1.56%	-1.94%	0.69%
College/HS Wage Premium at 10 Yrs Exp*	1.92%	-0.45%	3.10%	0.18%

† In the progressive case, we allow for a progressive tax on labor earnings but assume a 15% flat tax on capital.

‡ In the flat tax regime, we hold the tax on capital fixed at 15% but assume that the tax on labor income is flat. Balancing the budget yields a tax rate on labor income of 7.7%. In the consumption tax reform only consumption is taxed at a 10% rate.

*The college - high school wage premium measures the difference in mean log wage rates between college graduates and high school graduates with ten years of work experience.

(Taken from Heckman, Lochner, and Taber, *AER*, 1998)

Summary

- Multiple dimensions of labor supply with different elasticities in the short run and long run
- Incentives matter
- Measuring tax incentives should be done looking at the full range of taxes/subsidies facing agents recognizing the full array of tax/subsidy programs in place

- Recognize the structure of interdependence in economic choices.
- Recognize capacity of workers and firms to substitute to avoid tax.
- Recognize that both wages and quantities adjust. Use estimates that account for this.