Chapter 21
Taxes on Labor Supply

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Introduction

- Between 1987 and 1988, Iceland transitioned from a retrospective income tax system (e.g., paying the previous year's income) to a flat income tax system on a pay-as-you-go basis.
- During this transition, the labor income from 1987 was never taxed.
- Figure 1 shows the labor market result.

Figure 1
Labor supply spiked in 1987, a transition year with no income tax.

Introduction

- Overall employment spiked up from 78% to 81% during the year.
- Real GDP growth rate leapt up from 4.3% to 8.5%.
- As the chart shows, these effects were transitory, however. Once the anticipated “tax holiday” ended, the economy returned to normal.
- This example highlights that taxes can affect economic decisions, such as the one to work.
- In balancing equity versus efficiency, higher taxes may discourage work and shrink the size of the economic pie.

Introduction

- This lesson first discusses the theory of taxes and labor supply.
- It then reviews the empirical evidence, focusing much of the attention on the Earned Income Tax Credit.
- Finally, we review the tax treatment of child care expenses.

TAXES ON LABOR SUPPLY – THEORY

Basic Theory

- The basic labor supply theory is similar to the analysis of cash welfare on labor supply, which was reviewed earlier.
- Ava has a utility function, U(L,C), where L represents hours of leisure, and C is consumption goods.
- Her budget constraint is illustrated in Figure 2.
**Taxes on labor supply – Theory**

**Basic Theory**

- Ava’s initial budget constraint, the blue line, is initially expressed as:

\[ C + wL = wT \]

- Where the price of consumption goods is normalized to unity, and T is the full time endowment.
- She initially chooses bundle \( A \), that is \((L_1, C_1)\).

- **Figure 2**

**Taxes on labor supply – Theory**

**Basic Theory**

- After a proportional income tax is introduced, her budget constraint rotates downward to the red line, becoming:

\[ C + (1 - \tau)wL = (1 - \tau)wT \]

- For any given amount of work effort, Ava would be able to purchase fewer consumption goods.
- Ava’s wage rate falls from \( w \) to \((1-\tau)w\).
- An important policy question is whether this income tax discourages Ava from working.
- **Figure 3** illustrates two possibilities of the income tax.

**Taxes on labor supply – Theory**

**Basic Theory**

- In the first picture, Ava consumes more leisure and less hours of work. Here leisure increases from \( L_1 \) to \( L_2 \). In this case, the substitution effect is larger than the income effect.
- In the second picture, Ava consumes less leisure and more hours of work. Here leisure decreases from \( L_1 \) to \( L_3 \). In this case, the substitution effect is smaller than the income effect.
- At low levels of labor supply, it seems very unlikely that income effects could be larger than substitution effects, because the income effects are proportional to hours worked before the wage change.

**Taxes on labor supply – Theory**

**Limitations on the theory**

- The basic labor supply theory is an “idealized view” of the labor market. In reality, a number of additional constraints factor in.
- For example, it is unlikely that individuals can freely adjust their hours of work.
- In addition, constraints like overtime pay change the budget constraint.
- **Overtime pay rules** mean that workers in most jobs must legally be paid one and a half times their regular hourly pay if they work more than 40 hours per week.
- These rules create a non-convexity in the budget constraint, and make it expensive for firms to hire workers for more than 40 hours per week.
Taxes on labor supply – Evidence

- The empirical literature on taxation and labor supply makes a distinction between two kinds of workers.
- **Primary earners** are the family members who are the main source of labor income for a household.
- **Secondary earners** are workers in the family other than the primary earners.
- Traditionally, primary earners are thought of as husbands and secondary earners as wives who were in charge of child care.

The general conclusions from econometric studies are that:
- Labor supply elasticities for primary earners are around +0.1, a fairly small effect.
- Labor supply elasticities for secondary earners are in the range of +0.5 to +1.0, a much larger effect. This effect comes mainly from the extensive margin of whether to work or not, rather than the intensive margin on the actual number of hours to work.

Estimating the elasticity of labor supply

- There have been three main approaches to estimating these labor supply elasticities:
  - Cross-sectional linear regression evidence
  - Social experiments
  - Quasi-experiments

The cross-sectional approach estimates an equation of the form:

\[ LS = \alpha + \beta ATWAGE + \delta NLINCOME + \lambda X + \epsilon \]

Where \(LS\) is a measure of labor supply, \(ATWAGE\) is the last-dollar after-tax wage, \(NLINCOME\) is non-labor income, and \(X\) is a vector of individual and family characteristics such as education and marital status.

- If \(\beta > 0\), then the labor supply curve is upward sloping and the substitution effect dominates the income effect.

Another approach is using a randomized experiment.

This, in fact, was done in the 1970s with the negative income tax (NIT) experiment. The welfare guarantee and tax rate were randomly assigned to different families.

This work found the male labor supply elasticity to be +0.1.

By including non-labor income, the regression attempts to separate the substitution and income effects.

The coefficient \(\beta\) includes both effects, while the coefficient \(\delta\) includes only the income effect.

These coefficients likely suffer from bias however. Individuals with high earnings may be overachievers who would work long hours no matter what the wage.
Estimating the elasticity of labor supply

Eissa (1995) examined the labor supply of married women in response to the Tax Reform Act of 1986. The tax reform dramatically changed marginal tax rates for the wives of very-high-earning men (in the 99th percentile of income), but had a much more modest effect on wives of moderately-high-earning men (in the 75th percentile).

She found labor supply elasticities for married women of +0.8.

Empirical Evidence

Taxes on labor supply – Evidence

Limitations of existing studies

All of the existing studies have a number of limitations:

- In more recent decades, there is a blurring between “primary” and “secondary” earners.
- In addition to labor force participation and hours of work, factors such as job effort, job productivity, and job amenities may vary.
- What matters for social efficiency is how taxes affect the total product of society. If individuals do not work fewer hours, but exert less effort, there is still deadweight loss.

TAX POLICY TO PROMOTE LABOR SUPPLY

The Earned Income Tax Credit

We now apply these lessons to the study of the EITC.

The Earned Income Tax Credit (EITC) is a federal income tax policy that subsidizes the wages of low-income earners.

- Was started in 1976, has grown tremendously with expansions in generosity in the 1980s and 1990s.
- Figure 4 shows total EITC spending over time.

Figure 4

EITC spending (billion of $)


$3 $5 $7 $9 $11 $13 $15

EITC spending increased after 1987, and especially after 1993.

Tax policy to promote labor supply

The Earned Income Tax Credit

The current structure of the EITC is shown in Figure 5.

- Initially, the EITC presents a 40% wage-subsidy, by offering a refundable tax credit, and when earnings are sufficiently high, the credit is reduced at a tax rate of 21%.

Figure 5

Earned income tax credit, EITC

$0 $5,000 $10,000 $15,000 $20,000 $25,000 $30,000

The second has a zero marginal tax rate.

The third segment is a tax of 21%.

The current EITC has 3 segments. The first is a subsidy. The second has a 40% tax rate. Step 1 = 0.21
The impact of the EITC on labor supply

Theory

- We can translate this EITC schedule onto the budget constraints shown previously.
- This is illustrated in Figure 6.

The figure shows four distinct groups:
- For those out of the labor force, located at point A, the EITC unambiguously increases labor force participation through the substitution effect.
- For those at points like B, the subsidy creates ambiguous effects on hours of work. The substitution effect increase work, while the income effect decreases it.
- For those at points like C, the subsidy decreases hours of work because of the income effect. There is no substitution effect.
- For those at points like D, the phase-out region, the income and substitution effects both decrease labor supply.

Evidence

- The empirical literature on the EITC relies on the fact that the structure of the credit has changed over time, and differentially for different groups in the population.
- Figure 7 illustrates the changes from the Tax Reform Act of 1986.

The effect of the EITC on single mother labor supply

- Eissa and Leibman (1996) study the effects of this change on single women with children (who benefited from the policy) to single women without children (who were unaffected).
- They found large effects of the EITC on labor force participation, a finding replicated using later law changes by Meyer and Rosenbaum (2000).
The impact of the EITC on labor supply

Evidence

- The conclusions from a number of quasi-experimental studies about the EITC show that:
- Labor force participation increased for single mothers.
- Conditional on work, the EITC does not seem to much affect hours of work.
- Since the EITC is computed based on family income, married couples are likely to fall into the phaseout range. Eissa and Hoyes (1998) find a modest reduction in labor supply among married women in response to the EITC.

The EITC marriage penalty

- One major objection to the current EITC relates to the last point about the treatment of married couples.
- There is often a significant marriage penalty, in terms of a reduction in the credit, if two low-wage earners marry. This is because the EITC uses family income to compute the credit level.
- Ellwood (2000) found that the average marriage penalty is $1,600.

Overall, the U.S. experience with the EITC seems fairly successful.

- It delivers more cash to low income families than any other welfare program in the U.S.
- Has not reduced overall labor supply.
- Rather, the redistribution has been associated with increased labor supply among single mothers, no effect on fathers, and a modest reduction in labor supply among married mothers.

THE TAX TREATMENT OF CHILD CARE

- Wages are not the only factor that determines work decisions.
- Child care is care provided for children by someone other than the parents of those children.
- Only one-fourth of preschool aged children are cared for solely by the parents; the majority are placed in child care centers.
- Theoretically, child care expenditures lower the net wage in a similar fashion to tax rates.
- Total child care expenditure is over $60 billion.

THE TAX TREATMENT OF CHILD CARE

- The Haig-Simons comprehensive income standard is important in the analysis of child care.
- Labor delivered through the market is taxed, while labor delivered through non-market activities, like home child care, is untaxed.
- This bias is illustrated in Table 1.

 animate the child care choices in Table 1.
The tax treatment of child care

- The first row of the table shows that if child care costs are not deductible, the after-tax value of work is less than the after-tax value of non-market work.
- The tax of market work, but not home production, has created a “tax wedge” that puts market work at a disadvantage.
- Here we are referring to tax wedges across input markets.
- The broadest definition of tax wedges is any difference between pre- and posttax returns to an activity caused by taxes.

Options for resolving tax wedges

- The first row of the table illustrates a general point about tax wedges: they distort behavior by encouraging people to undertake the untaxed activity and cause deadweight loss.
- There are two ways to “level the playing field.”
  - First, one could impute home earnings, which is assigning a dollar value to the value from work at home. This is done in the second row.
  - Second, one could make child care costs deductible. This is done in the third row.
- That is, taxing all activities or subsidizing all activities levels the playing field.

Comparing the options

- These options have different effects on the tax base, however. Allowing the deduction for child care has lowered the tax base.
- Thus, other tax rates must increase at the same time to raise a given level of revenue, and deadweight loss will rise as these tax rates rise.

Comparing the options

- Assuming that the second option, imputing a market value to home production and taxing it, is infeasible, which of the other two options is more efficient?
- Put differently, is it better to have a tax wedge or to allow a child care deduction? It depends on the elasticities of the taxed activities.
  - The efficiency of lowering the overall tax base depends on the overall elasticity of economic activity with respect to taxation, which is thought to be modest.
  - The efficiency cost of distorting mothers away from market work depends on their labor supply elasticity, which is thought to be high.