Designing an optimal tax system requires a good understanding of how taxes impact the economy. Ideas on how tax policy affects the economy have changed over time. This session will review the theory and evidence of how taxes impact saving, investment, wages, jobs, output, and income. What has worked, and what has not?

1. Labor and capital both respond to tax changes, leading to “excise effects” which impact the quantity of inputs and outputs in the economy. Taxes cause “deadweight loss.” Both tax rates and tax bases are important considerations of a tax system.

2. Demand does not change as taxes change; rather, according to Say’s law, production is the source of demand.

3. The tax code should be neutral in the way it treats saving and consumption.

4. Full expensing fixes a bias in the corporate tax code that results in companies being unable to fully deduct the costs of their investments in present-value terms.

5. Do taxes discourage work or force people to work harder?

Further Reading:


Key Points

• Imposing a tax creates a “wedge” at the margin that raises the price, reduces the return, reduces the activity, and creates a “dead-weight loss”.

• The tax base and the tax rate interact; effective marginal rates can exceed the statutory rate.

• Some activities are taxed more than once; the combined rates compound, and can be very high.
Imposition of a Tax

- Supply (With Tax)
- Supply (No Tax)

- Reduction in Value of Economic Output
- Loss to Consumer
- Loss to Producer

- Resources Redirected to Other Activities

Price vs. Quantity Graph:
- Price $P_0$, $P_1$, $P_2$
- Quantity $Q_0$, $Q_1$

Diagram shows the impact of a tax on market equilibrium, illustrating the change in price and quantity.
The deadweight loss (DWL) from a tax rises with the square of the rate.

Single-rate sales taxes have less DWL than multiple-rate.

A 2% flat rate on all items would have 4 units of DWL in this diagram.

If half of items were taxed at 1% and half at 3%, the DWL would be $9/2 + 1/2$ units or 5 units of DWL.
Higher Tax Rates Raise, Then Lower Revenues

- Tax Revenues at 3 Different Tax Rates
- Deadweight Loss Grows with Rate-Squared

Quantity

Price

Supply

Demand
Laffer Curve

Optimum tax rate: value of government services equals revenue and growth costs that taxes impose on society.

Government revenue maximized, but tax rate too high because it's hurting economic growth.

Tax rate much too high. It's hurting growth and lowering government revenue.

Normal Range

Prohibitive Range
Effect of Tax On Labor

- **Wage**
  - **Gross Wage**
    - **Tax**
    - **Net Wage**
  - **Labor Supply**
  - **Marginal Product of Labor (Demand)**
    - MPL would rise if labor had more capital to work with, and fall if capital formation lagged.

- **Hours Worked**
  - Drop in Labor
  - L₁, L₀
Effect of Tax On Desired Capital Stock

Return to Capital

Gross Return

Tax

Net Return

Required Return to Capital (Supply)

Marginal Product of Capital (Demand)

Drop in Capital

K₁

K₀

Desired Amount of Capital
Taxes and Growth (TAG) Model

It works like the economy:

<table>
<thead>
<tr>
<th>Changes In:</th>
<th>Determine:</th>
<th>Determine:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Capital</td>
<td>Size of Capital Stock: i.e., Tools, Equipment, Buildings</td>
<td>Amount of Output (GDP) &amp; Income</td>
</tr>
<tr>
<td>Cost of Labor</td>
<td>Size of Labor Supply: i.e., Hours worked, # of People in the Workforce</td>
<td></td>
</tr>
</tbody>
</table>
A Smaller Stock Of Capital Reduces Wages

Wage

W_0

W_1

Labor Supply

MPL (K_0)

MPL (K_1)

N_0

N_1

Employment
Backward-Bending Labor Supply?
If the tax system hits the same income more than once, or if tax rules overstate actual income, effective marginal tax rates may exceed statutory marginal tax rates.

Example: The Statutory Marginal Tax Rate is 15%, but suppose each extra $1 of income increases taxable income by $1.50. The True Marginal Tax Rate on the extra $1 is 22.5% ( = 15% x 1.5).
### New Marginal Tax Rates and Brackets in TCJA

#### Individual Taxpayers

<table>
<thead>
<tr>
<th>If Taxable Income Is Between:</th>
<th>The Tax Due Is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $9,525</td>
<td>10% of taxable income</td>
</tr>
<tr>
<td>$9,526 - $38,700</td>
<td>$952.50 + 12% of the amount over $9,525</td>
</tr>
<tr>
<td>$38,701 - $82,500</td>
<td>$4,453.50 + 22% of the amount over $38,700</td>
</tr>
<tr>
<td>$82,501 - $157,500</td>
<td>$14,089.50 + 24% of the amount over $82,500</td>
</tr>
<tr>
<td>$157,501 - $200,000</td>
<td>$32,089.50 + 32% of the amount over $157,500</td>
</tr>
<tr>
<td>$200,001 - $500,000</td>
<td>$45,689.50 + 35% of the amount over $200,000</td>
</tr>
<tr>
<td>$500,001 +</td>
<td>$150,689.50 + 37% of the amount over $500,000</td>
</tr>
</tbody>
</table>

#### Married Individuals Filing Joint Returns and Surviving Spouses

<table>
<thead>
<tr>
<th>If Taxable Income Is Between:</th>
<th>The Tax Due Is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $19,050</td>
<td>10% of taxable income</td>
</tr>
<tr>
<td>$19,051 - $77,400</td>
<td>$1,905 + 12% of the amount over $19,050</td>
</tr>
<tr>
<td>$77,401 - $165,000</td>
<td>$8,907 + 22% of the amount over $77,400</td>
</tr>
<tr>
<td>$165,001 - $315,000</td>
<td>$28,179 + 24% of the amount over $165,000</td>
</tr>
<tr>
<td>$315,001 - $400,000</td>
<td>$64,179 + 32% of the amount over $315,000</td>
</tr>
<tr>
<td>$400,001 - $600,000</td>
<td>$91,379 + 35% of the amount over $400,000</td>
</tr>
<tr>
<td>$600,001 +</td>
<td>$161,379 + 37% of the amount over $600,000</td>
</tr>
</tbody>
</table>
Chart 17  Cumulative Marginal Tax Rate For A Single Taxpayer Earning $12,000 to $40,000 With 2 Children

- Federal Income Tax (10%, 15%)
- EITC Phase-Out (21.06%)
- Payroll Tax (7.65%)
- State Income Tax (3%)
- Child Tax Credit (-15%)
- Cumulative Marginal Tax Rate

Key:
- 16.71%
- 26.71%
- 41.71%
- 46.71%
- 25.65%
Effective Federal* Marginal Tax Rates for Social Security Recipients

Marginal tax rates as Social Security benefits become taxable, in tier 1 (50% phase-in range) or tier 2 (85% phase-in range)

<table>
<thead>
<tr>
<th>Statutory Income Tax Rate</th>
<th>Tier 1 (150% of statutory income tax rate)</th>
<th>Tier 2 (185% of statutory income tax rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>15%</td>
<td>18.5%</td>
</tr>
<tr>
<td>12%</td>
<td>18%</td>
<td>22.2%</td>
</tr>
<tr>
<td>22%</td>
<td>NA</td>
<td>40.7%</td>
</tr>
</tbody>
</table>

* Add 4 to 8 percentage points for typical state income tax rates for states that follow federal taxation of benefits.

** Tax-exempt bond income is included in determining whether income is over the threshold for taxing benefits. An additional dollar adds $0.50 or $0.85 to taxable income, producing effective tax rates of 50% or 85% of the statutory rate on the supposedly exempt income.
Effective Federal* Marginal Tax Rates for Social Security Recipients

Marginal tax rates as Social Security benefits become taxable, in tier 1 (50% phase-in range) or tier 2 (85% phase-in range)

<table>
<thead>
<tr>
<th>Statutory Income Tax Rate</th>
<th>Statutory Income</th>
<th>Wage Income**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not subject to earnings test</td>
<td>Subject to earnings test (62 to “normal retirement age”)</td>
</tr>
<tr>
<td></td>
<td>Tier 1</td>
<td>Tier 2</td>
</tr>
<tr>
<td>10%</td>
<td>28.4%</td>
<td>31.9%</td>
</tr>
<tr>
<td>12%</td>
<td>31.3%</td>
<td>35.5%</td>
</tr>
<tr>
<td>22%</td>
<td>NA</td>
<td>53.3%</td>
</tr>
</tbody>
</table>

* Add 4 to 8 percentage points for typical state income tax rates for states that follow federal taxation of benefits.

** Assumes self-employed payroll tax, and allows for deduction of "employer's" half of payroll tax from AGI and effect of deduction on modified adjusted gross income used to determine amount of Social Security benefits subject to income taxation. Figures would be very similar for employee beneficiaries after adding the employee and employer payroll tax rate adjusted for income tax deduction of employer's half at employer's income tax rate.
Multiple Taxation of Saving:
One Tax on Consumption, Four Taxes on Saving

Layer 1 – Tax on Earnings
Income is taxed when earned. If it is used for consumption, there is usually no further federal tax.

Layer 2 – Personal Income Tax on Saving Returns
If the income is saved, the returns are taxed as interest, dividends, capital gains, or noncorporate business profits.

Layer 3 – Corporate Income Tax
If the saving is in corporate stock, the corporate tax taxes the income before it is either paid out to shareholders or reinvested to boost future earnings.

Layer 4 – Transfer (Estate and Gift) Tax
Another tax on already taxed assets.

(Similar taxes at the state and local levels increase the multiple taxation. Property taxes, excises, and tariffs add more.)
Combined Top Federal Corporate and Shareholder Marginal Tax Rates on Corporate Income

(Old law, left bars, Tax Cuts & Jobs Act, right bars)

<table>
<thead>
<tr>
<th>Corporate Tax Only</th>
<th>+ 15% Shareholder Tax</th>
<th>+ 20% Shareholder Tax</th>
<th>+ 23.8% Shareholder Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.00%</td>
<td>44.75%</td>
<td>48.00%</td>
<td>50.47%</td>
</tr>
<tr>
<td>21.00%</td>
<td>32.85%</td>
<td>36.80%</td>
<td>39.80%</td>
</tr>
</tbody>
</table>
Advantage of Tax-Deferred Saving Over Ordinary Tax Treatment: Buildup of $1,000 Earned and Saved Per Year

Saving from age 19 onward under tax-deferred system and ordinary tax treatment
Deferred plan: $1,000 saved tax-deferred each year earning 7.2% pretax return, all taxed 20% on withdrawal
Ordinary saving: $800 saved each year after 20% tax on $1,000 of income, earning 5.76% after-tax return
Marginal Tax Rates On Estates
And Income Contributed To Estates, 40% Estate Tax Rate

*A 40% Estate Tax Rate, with a $5 million exclusion indexed for inflation, became effective in 2010-2011. The exclusion is $5,450,000 in 2016. Assumes a self-employed married couple in the 33% federal income tax bracket, with a 6% state income tax (taken as an itemized deduction.
Depreciation Requires Businesses to Pay Tax on Income That Doesn’t Exist

Average Depreciation Allowance and Taxes on $100 of Capital Investment in the U.S.

On a $100 investment, a business can deduct an average of $62.40 from their revenue over the life of the asset, not the full $100 cost.

Due to this mistreatment of capital investment, businesses pay taxes on income that doesn’t exist.

This means that a full $37.60 of that $100 investment does not count as a business cost. This understates costs and overstates business profits.

Tax on Disallowed Cost Recovery = $13.16
Equalizing Treatment of Saving and Consumption

• Expense investment (immediate write-off of plant, equipment, and structures, or present value equivalent)
• Make saving either tax deferred or returns exempt (as with regular or Roth-style IRAs, but for all saving, with no limitations on amounts or timing)
• Integrate corporate tax with owners’ tax (tax at business or ownership level, not both)
• End estate and gift tax