Microeconomic Theory Review

Wojciech Kopczuk, adapted by Kyle Coombs

Vassar College

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Evaluate the Earned Income Tax Credit (EITC)

- For 2025, the NY EITC will rise from 30% to 45% of the federal EITC
- Gov. Hochul asks how this will affect hours worked and labor force participation
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- What are you less certain about?

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- What can you say with near certainty?
- What are you less certain about?
- Depends on (1) the shape of the EITC and (2) your model of behavior

Depends on modeling assumptions

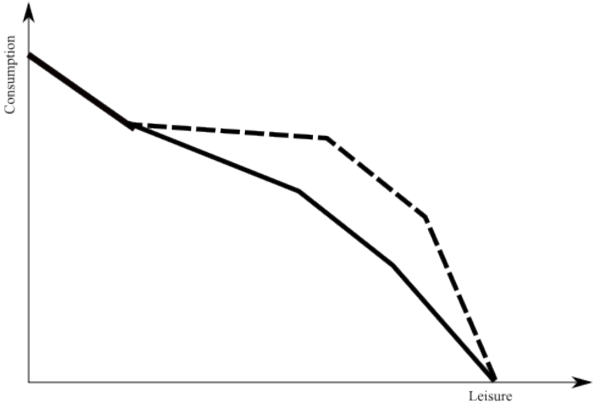

Figure 1: The EITC budget constraint where "leisure" is time not spent working. As "leisure" rises, labor supply falls.

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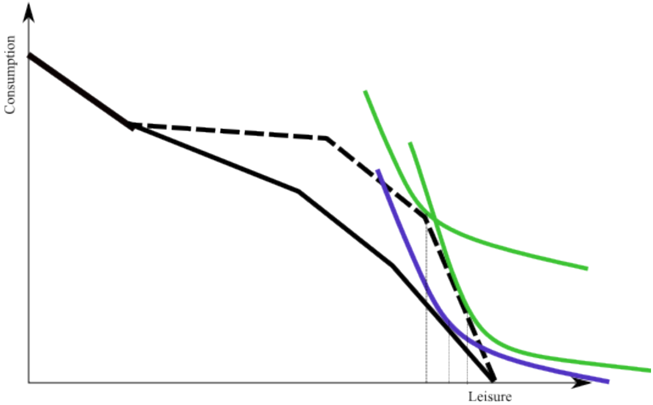

Figure 2: On the “phase-in,” substitution reduces leisure, but income effect positive.

Depends on modeling assumptions

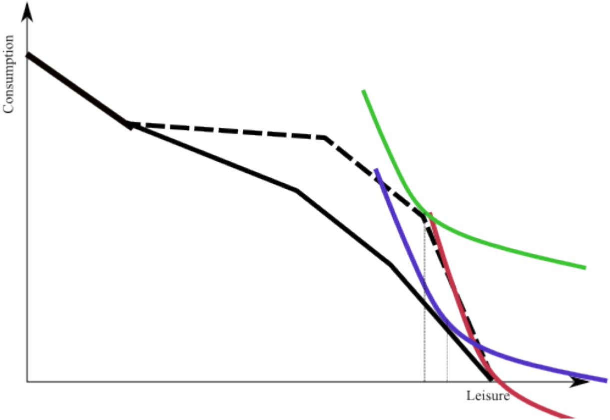

Figure 3: But no one stops working who is working.

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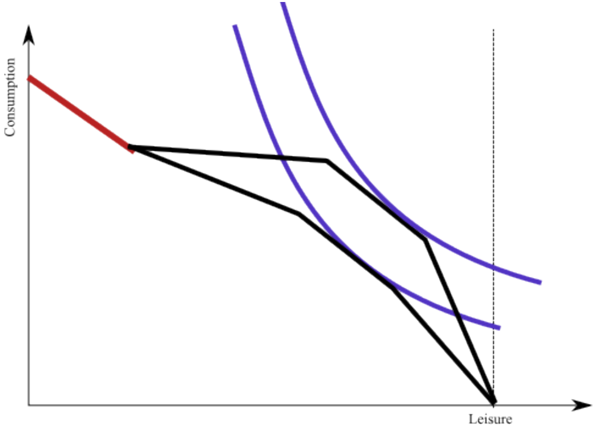

Figure 4: Someone on the "flat" of the EITC just receives an income effect. If we assume leisure is a "normal" good, then that means more leisure, less working.

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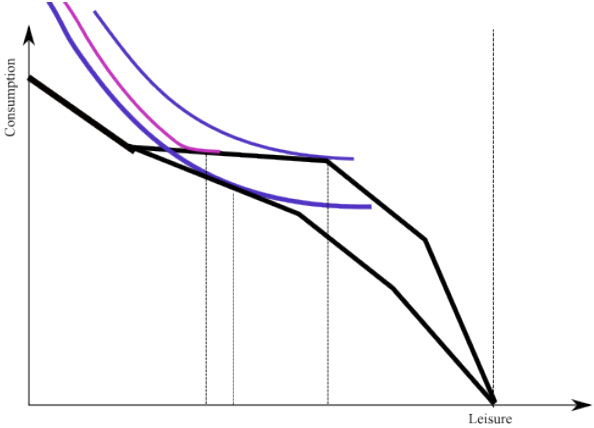

Figure 5: Someone on the "phase-out" of the EITC gets an income and substitution effect towards more leisure. If leisure is a normal good, the purple line is impossible.

Types of tools

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- **Economic theory**

- **Empirical analysis**

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  - Simplifications can be unrealistic but help us understand what variables are most critical to know
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  - Can be **normative** and **positive**
- **Empirical analysis**
  - Use data to estimate relationships between variables
  - Can be used to test theories
  - Often all about causal inference

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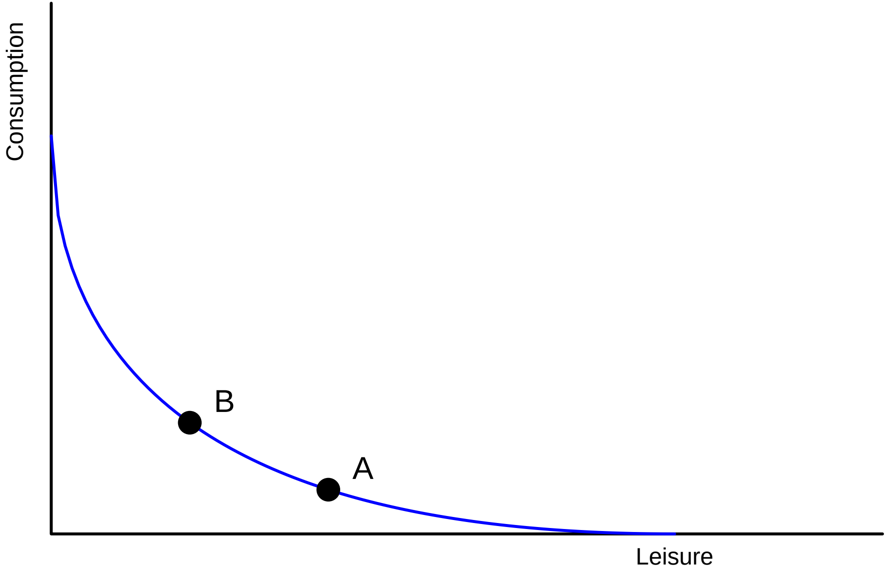
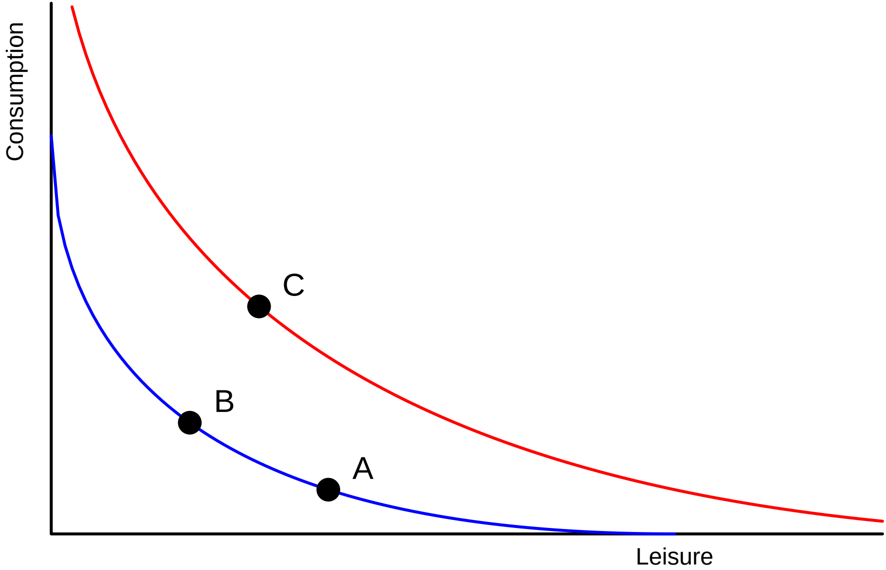
- Indifference curves


Consumption
B
A
Leisure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Utility

- Marginal utility

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If consuming $(Z, Y) = (2, 2)$, the marginal utilities are:
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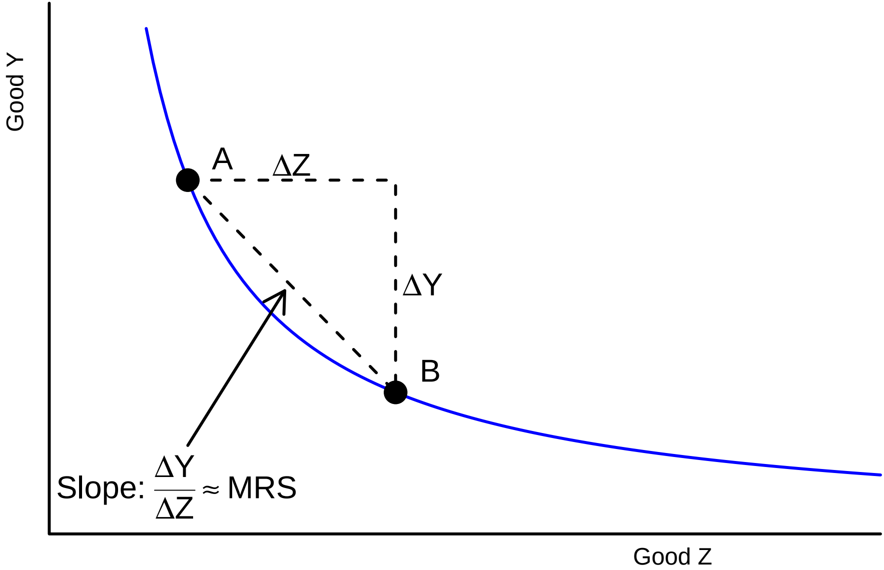
- The marginal rate of substitution (MRS) — the slope of the indifference curve. MRS of good Z to good Y:

$$MRS = -\frac{MU_Z}{MU_Y} = -\frac{10/Z}{20/Y} = -\frac{1}{2}\frac{Y}{Z}$$


Good Y
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ΔZ
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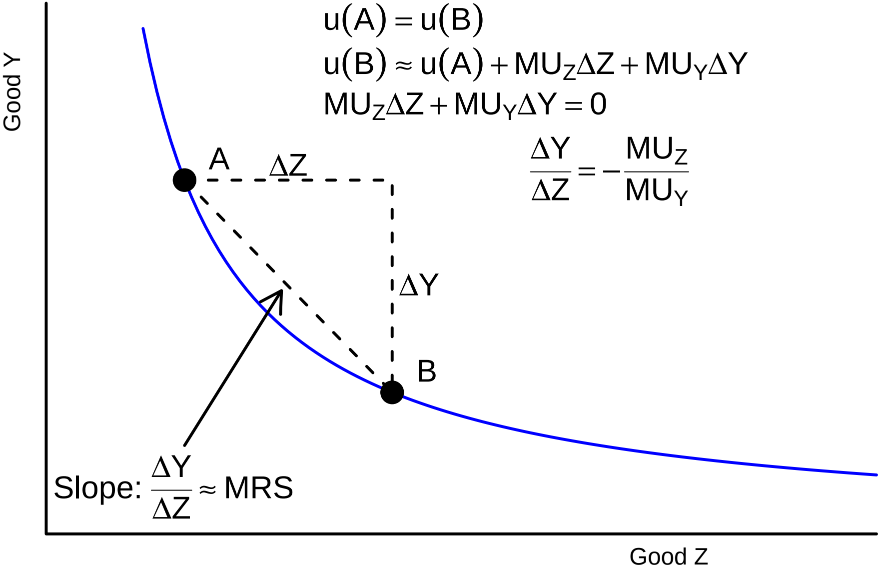
Slope: ΔY/ΔZ ≈ MRS
Good Z


$u(A) = u(B)$
$u(B) \approx u(A) + MU_Z \Delta Z + MU_Y \Delta Y$
$MU_Z \Delta Z + MU_Y \Delta Y = 0$
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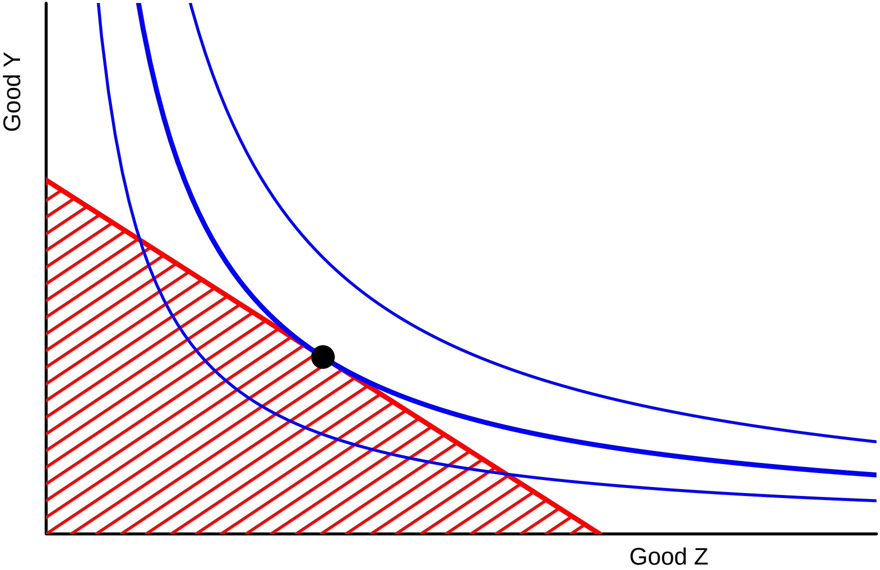
Good Y
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Example

$$U(Y, Z) = \frac{1}{3}\ln(Y) + \frac{2}{3}\ln(Z)$$
$$P_Y = 10,\ P_Z = 20,\ Y = 120$$

Submit an answer

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Method 1: $MRS = -\frac{\frac{1}{3}\frac{1}{Y}}{\frac{2}{3}\frac{1}{Z}} = -\frac{1}{2}\frac{Z}{Y}$.

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Solution: $Z = Y = 4$.

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Method 2:

The budget constraint is $10Y + 20Z = 120$ hence $Y = 12 - 2Z$. We want to pick the point with the highest utility on the budget constraint, hence we want to maximize

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$\Rightarrow$ hence $Z = 4$ and $Y = 12 - 2Z = 4$.

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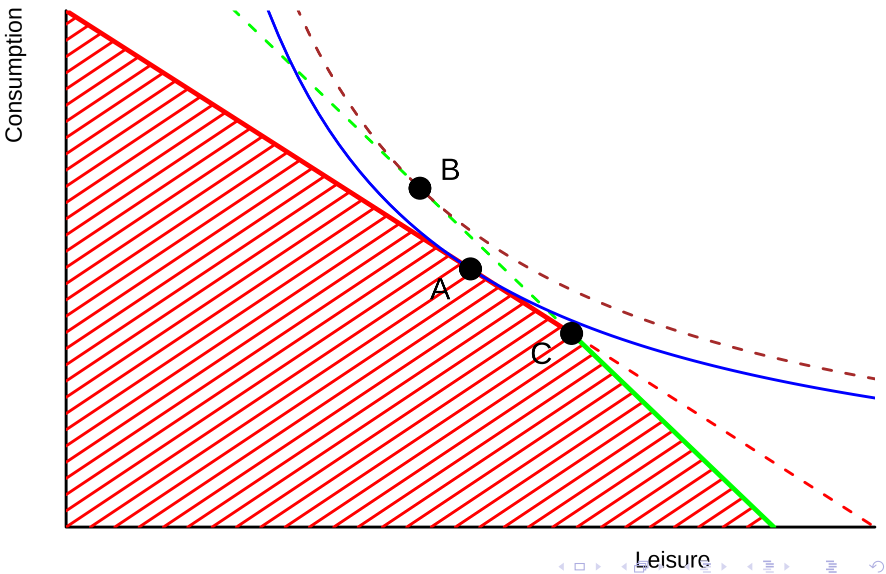
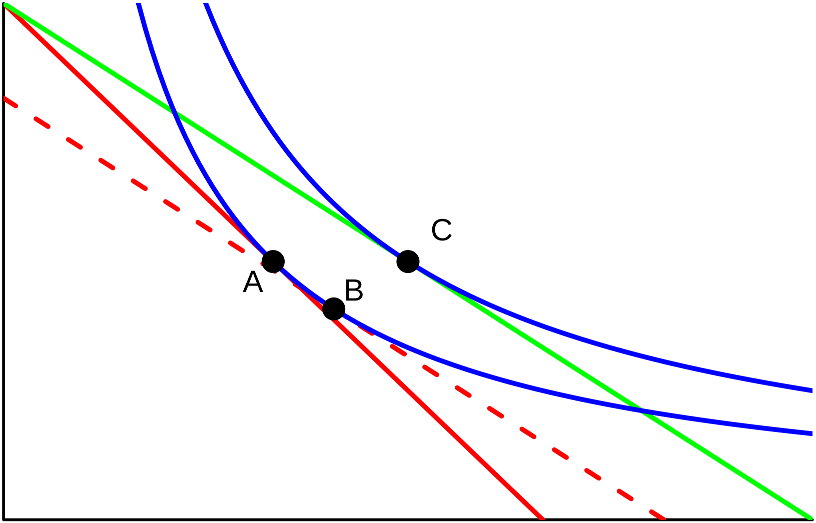
- Why care? Because they are pervasive in the tax/welfare context.
- Examples:
  - Earned Income Tax Credit (we'll talk more about it) provides a marginal subsidy if earnings are not too large and then slowly takes it away. Many related provisions in welfare programs.
  - Tax exemptions — no tax (labor valuable, leisure costly) up to certain income level, tax afterwards.
  - Progressive taxation — price of labor depends on your income.
  - Health insurance subsidies — the amount depends on the level of income.

Tax exemption over C: Why is budget constraint steeper?



Income and substitution effects



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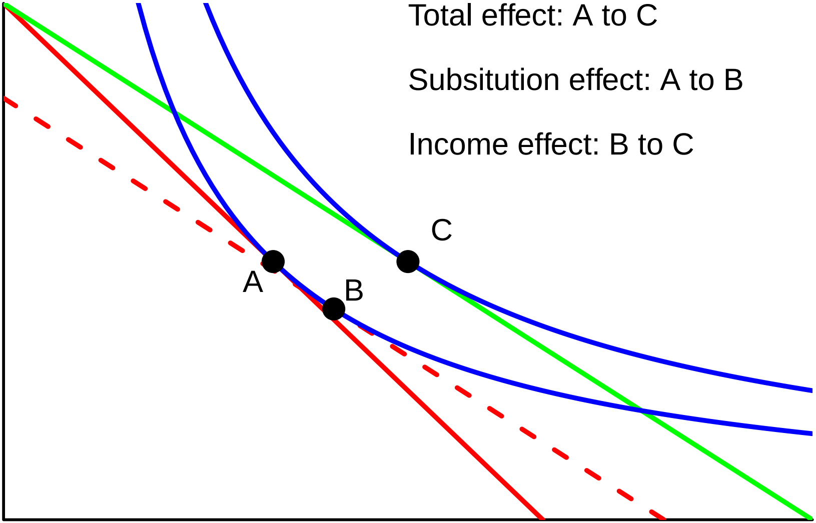

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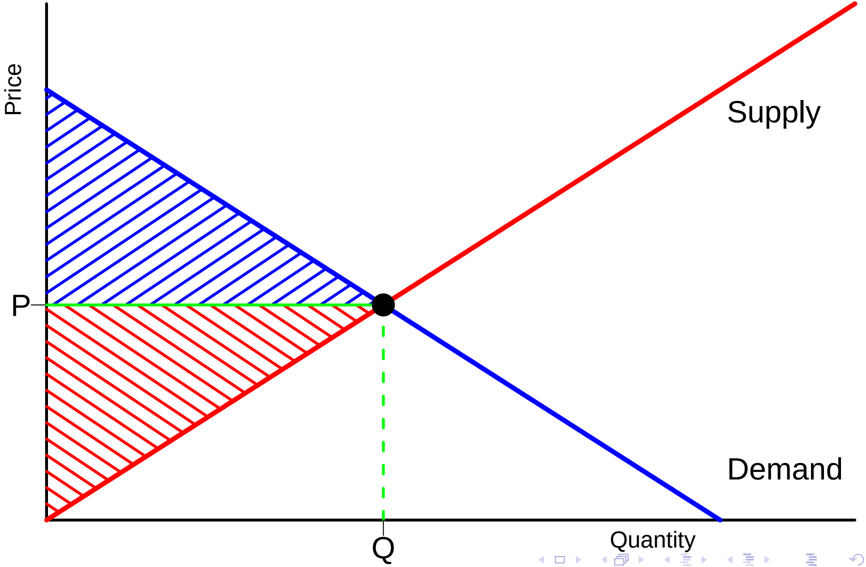
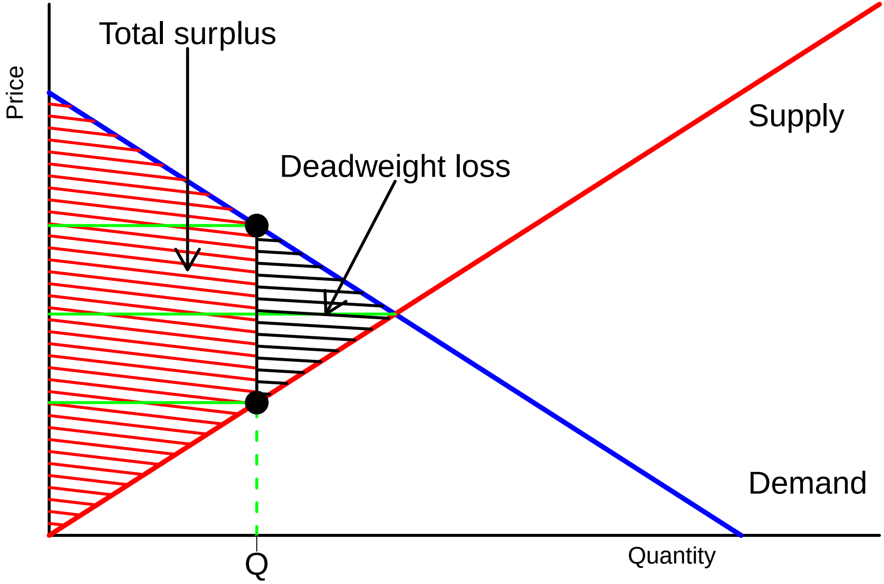
- You can see it by substituting $x = \ln(p)$ so that $\frac{d \ln(D(p))}{d \ln(p)} = \frac{d \ln(D(e^{\ln(x)}))}{dx}$ and work through the derivative with respect to x.

Equilibrium and efficiency




Total surplus
Price
Supply
Deadweight loss
Demand
Q
Quantity

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- At an (interior) Pareto efficient allocation MRSs for all individuals are the same.

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- No need for the government?

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Edgeworth Box

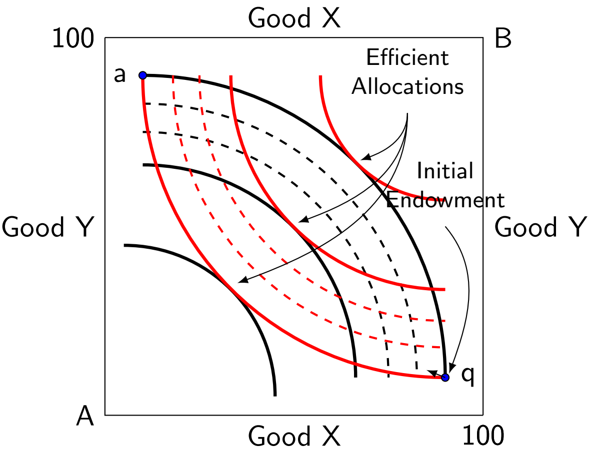

Figure 6: Edgeworth Box shows where marginal rates of substitution equate.

Contract curve: All Pareto efficient allocations

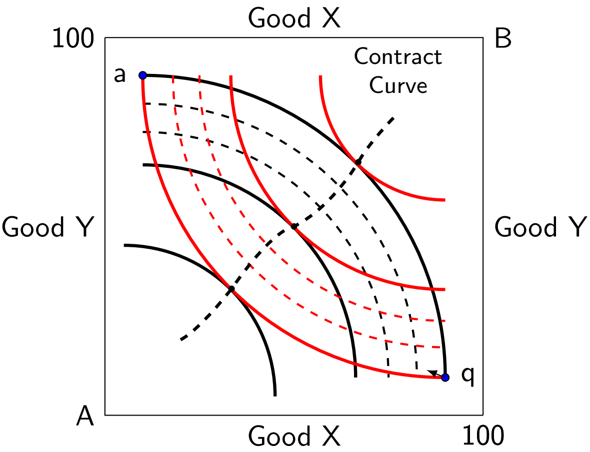

Figure 6: **Contract curve**: Locus of Pareto efficient allocations.

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- Anyone have guesses at a potential problem?

2nd Welfare Theorem Fallacy

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- $\Rightarrow$ Gov'ts need **distortionary** taxes and transfers based on economic outcomes (income, working position, wealth, location)
- $\Rightarrow$ Conflict between efficiency and equity: **Equity-efficiency trade-off**

Illustrating 2nd Welfare Theorem fallacy

Suppose 50% of the economy is unable to work due to disability (earn \$0) and 50% can work, earn \$100

Free market outcome: disabled get \$0, able-bodied get \$100

2WT: gov't differentiates disabled and able-bodied perfectly

$\Rightarrow$ taxes the able-bodied \$50 and gives to each disabled person

Instead: gov't can't tell apart disabled/able-bodied, uses work status

$\Rightarrow$ \$50 tax on workers + \$50 transfer to non-workers $\downarrow$ incentive to work
$\Rightarrow$ gov't can no longer do full redistribution
$\Rightarrow$ trade-off between equity and size of economic pie

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$\Rightarrow$ 2WT is a useful benchmark, but poor practical policy prescription

Summary

- We rely on basic microeconomic tools: utility to represent preferences, budget constraints, utility maximization, demand, supply, equilibrium
- Important concepts: marginal rate of substitution, income and substitution effects, elasticity, Pareto efficiency, deadweight loss
- Welfare theorems:
  - 1st: reference point, we will talk about deviations from it (market failures)
  - 2nd: focus on fairness but unrealistic method of redistribution