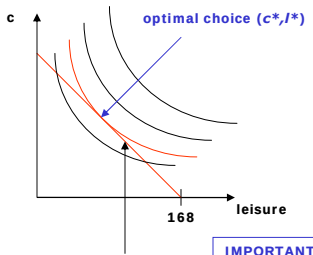
CONSUMPTION-LEISURE MODEL (CONTINUED)

FEBRUARY 4, 2009

CONSUMER OPTIMZATION

- **Consumer's decision problem:** maximize utility subject to budget constraint – bring together both **cost** side and **benefit** side
  - Choose ***c*** and ***l*** subject to $Pc + (1-t)Wl = 168(1-t)W$
  - Plot budget line
  - Superimpose indifference map



IMPORTANT: the larger is $(1-t)W/P$, the steeper is the budget line

- At the optimal choice

CONSUMPTION-LEISURE OPTIMALITY CONDITION

- key building block of modern macro models

$$\underbrace{\frac{u_l(c^*,l^*)}{u_c(c^*,l^*)}}_{\text{MRS (between consumption and leisure)}} = \underbrace{\frac{(1-t)W}{P}}_{\text{After-tax real wage}}$$

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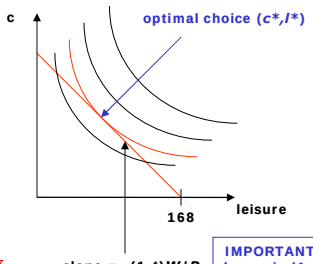

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MRS (between consumption and leisure) | After-tax real wage

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Derive consumption-leisure optimality condition using Lagrange analysis

LAGRANGE ANALYSIS

- Apply Lagrange tools to consumption-leisure optimization
- Objective function: $u(c,l)$
- Constraint: $g(c,l) = 168(1-t)W - Pc - (1-t)Wl = 0$

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- **Step 1:** Construct Lagrange function

$$L(c,l,\lambda) = u(c,l) + \lambda\left[168(1-t)W - Pc - (1-t)Wl\right]$$

- **Step 2:** Compute first-order conditions with respect to c, l, λ

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- **Step 3:** Solve (with focus on eliminating multiplier)

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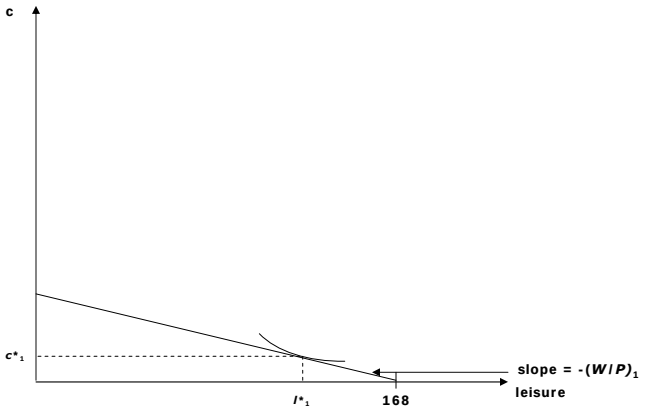
CONSUMPTION-LEISURE OPTIMALITY CONDITION

MICRO-LEVEL LABOR SUPPLY

An experiment: how do micro-level consumption/leisure choices change as the real wage changes (assume $t = 0$ here for simplicity)



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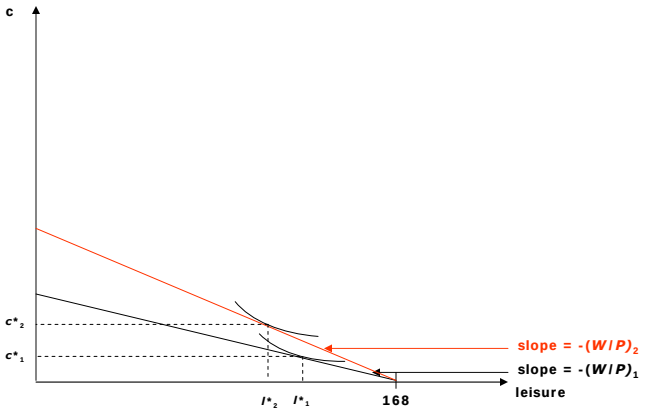

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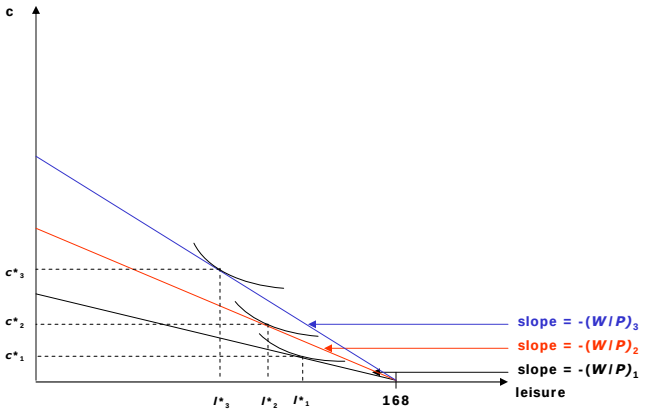

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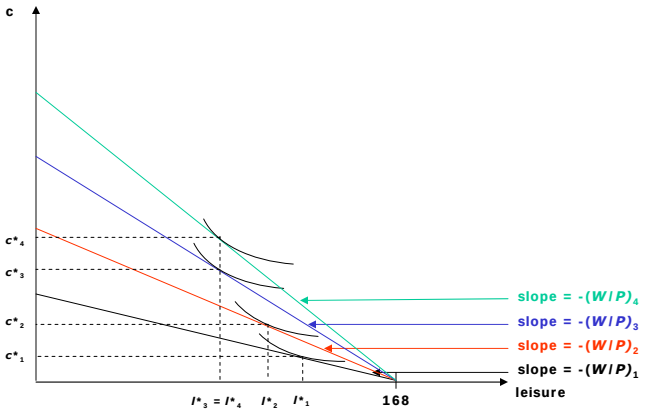

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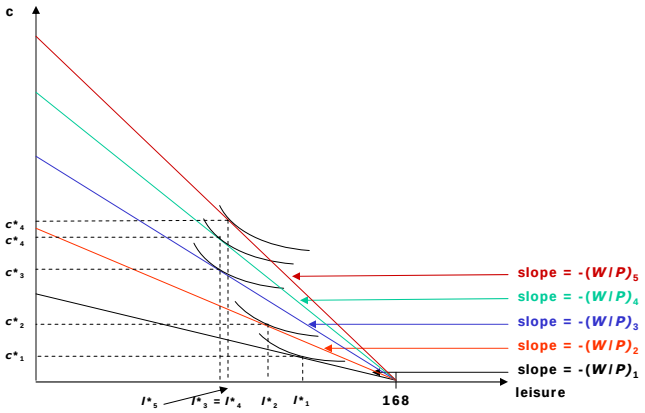

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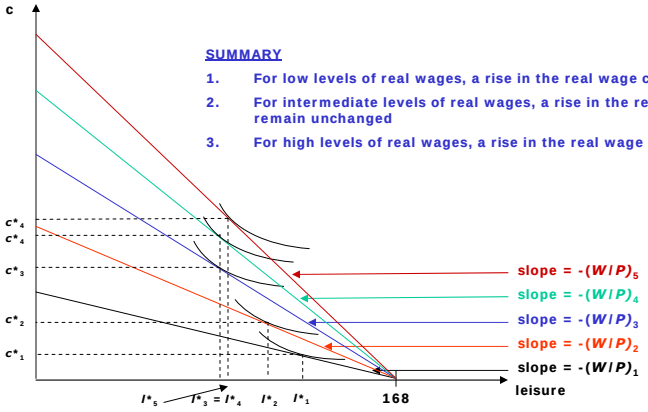
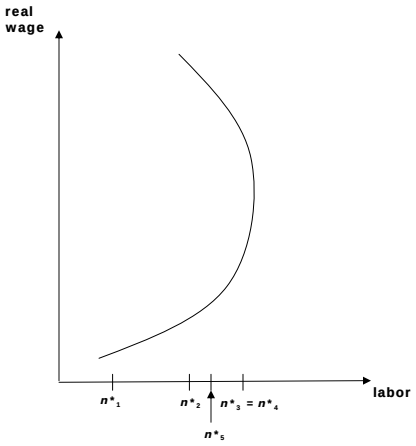


SUMMARY

1. For low levels of real wages, a rise in the real wage causes optimal leisure to decrease
2. For intermediate levels of real wages, a rise in the real wage causes optimal leisure to remain unchanged
3. For high levels of real wages, a rise in the real wage causes optimal leisure to increase

MICRO-LEVEL LABOR SUPPLY

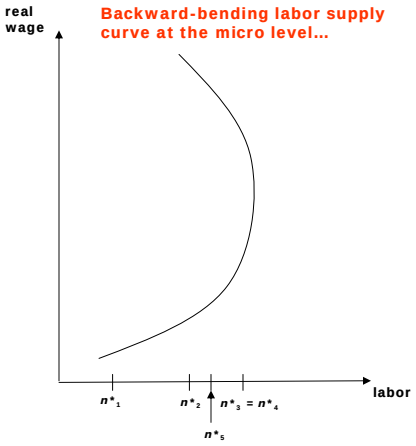
Using the relation $n = 168 - l$



MICRO-LEVEL LABOR SUPPLY

Using the relation $n = 168 - l$

Backward-bending labor supply curve at the micro level…



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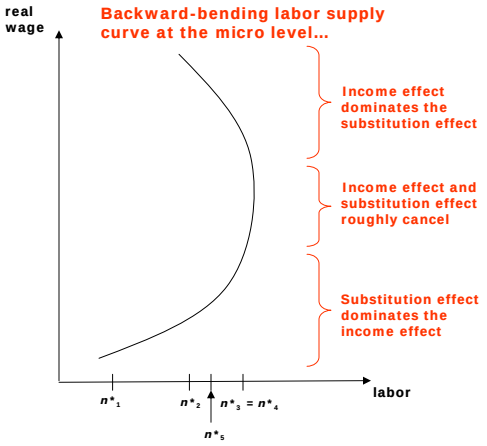

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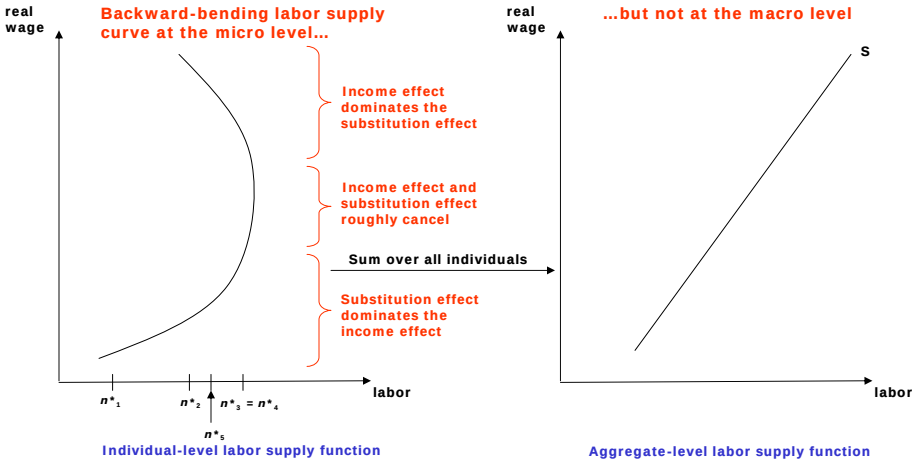

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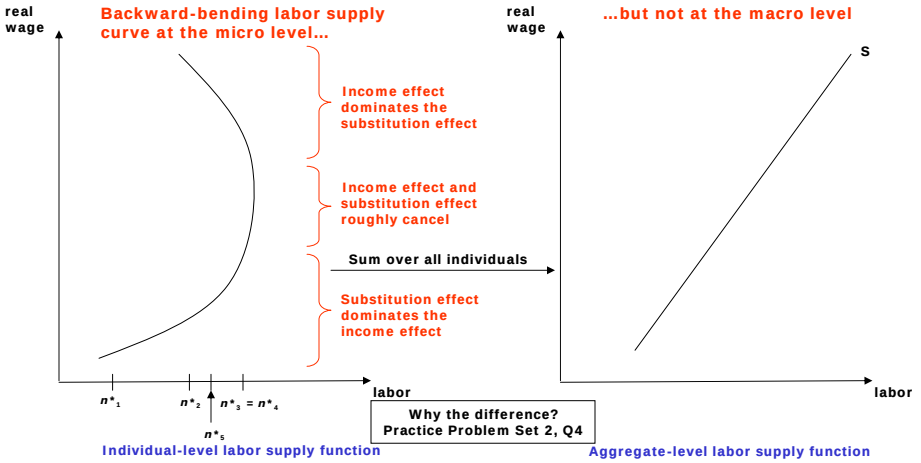

CONSUMPTION DEMAND

- Optimal choice of consumption was always rising as real wage was rising
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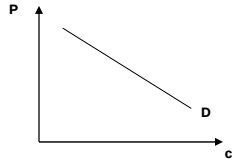
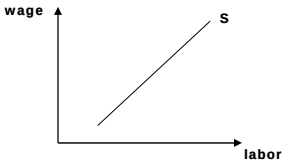
  - …and at the aggregate level
- Consumption demand over two-thirds of aggregate demand in developed countries

THE THREE MACRO (AGGREGATE) MARKETS

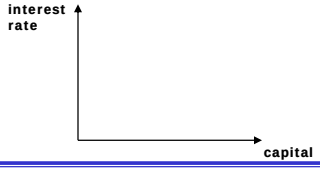
- **Goods Markets**
  - Demand derived from C-L model



- **Labor Markets**
  - Supply derived from C-L model



- **Capital / Savings / Funds / Asset Markets (aka Financial Markets)**



THE MACROECONOMICS OF TIME

- Consumption-leisure model a **static** (i.e., one time period) model
- **Dynamic** models the core of modern macroeconomic theory
- Explicit consideration of how economic decisions / behaviors / outcomes unfold over multiple time periods

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- Consumption-leisure model a **static** (i.e., one time period) model
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- Explicit consideration of how economic decisions/behaviors/outcomes unfold over multiple time periods
- Two-period model (Chapters 3 and 4) the simplest possible multi-period framework
  - Will allow us to begin analyzing issues regarding interest rates and inflation (phenomena that occur **across time**)
  - Will allow us to think about credit restrictions and the "credit crunch"
- Infinite-period model (Chapter 8)
  - Allows a richer quantitative description of the macroeconomy
  - Highlights the role of assets and the intersection between finance and macroeconomics