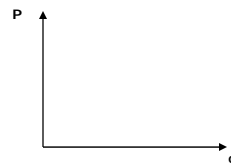


# CONSUMPTION-LEISURE MODEL

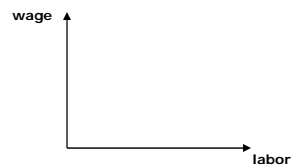
FEBRUARY 2, 2009

## THE THREE MACRO (AGGREGATE) MARKETS

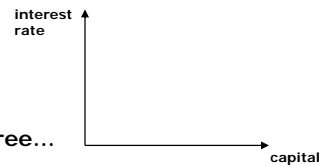
❑ Goods Markets



❑ Labor Markets



❑ Capital/Savings/Funds/Asset Markets



❑ Will put micro-foundations under all three...

## BASICS

- ❑ Consumption-Leisure Model – provides foundation for
  - ❑ Labor-market supply function
  - ❑ Goods-market demand function
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- ❑ Notation

- ❑  $c$ : consumption (“all stuff”)
  - ❑  $n$ : number of hours spent working per week
  - ❑  $l$ : number of hours leisure per week (time spent not working)
  - ❑  $P$ : dollar price of one unit of consumption (a nominal variable)
  - ❑  $W$ : hourly wage rate in terms of dollars (a nominal variable)
  - ❑  $t$ : tax rate on labor income
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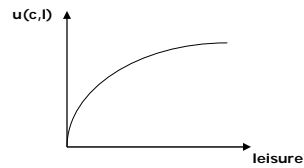
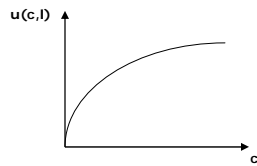
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- ❑ “Weekly” model a detail

- ❑ Could have called it a daily model, a monthly model, a yearly model, ...
- ❑ Just need to take SOME stand on the length of a “period”

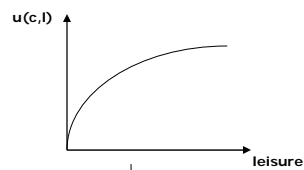
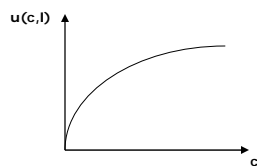
## UTILITY

- Preferences  $u(c, l)$  with all the “usual properties”
  - Strictly increasing in  $c$
  - Strictly increasing in  $l$
  - Diminishing marginal utility in  $c$
  - Diminishing marginal utility in  $l$
  - Plotted in good-by-good spaces:

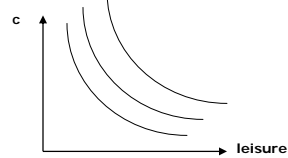


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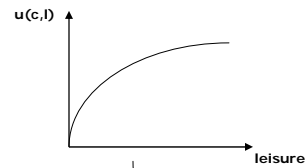
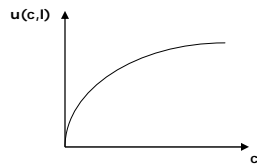


- Plotted as indifference curves

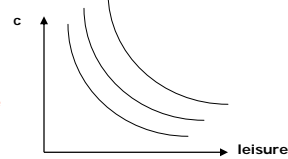


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- Plotted as indifference curves
- Utility side of consumption-leisure model no different than Chapter 1 model



February 2, 2009

9

## BUDGET CONSTRAINT

- Consumer must **work** for his income
  - $Y$  no longer “falls from the sky”

$$Pc = Y$$

February 2, 2009

10

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↓ Rearrange

$$Pc + (1-t)Wl = 168(1-t)W$$

⏟

Spending on consumption

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A constant from the point of view of the individual (price-taker)

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Simply an application/re-interpretation of our basic consumer theory model

$$P_1c_1 + P_2c_2 = Y$$

⏟

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⏟

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Chapter 1 budget constraint

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Rearrange

$$Pc + (1-t)Wl = 168(1-t)W$$

(After-tax) wage is *opportunity cost* of leisure, hence the “price” of leisure  
 - opportunity costs are *real economic costs/prices*

Simply an application/re-interpretation of our basic consumer theory model

Spending on consumption    “Spending” on leisure    A constant from the point of view of the individual (price-taker)

$$P_1c_1 + P_2c_2 = Y$$

Chapter 1 budget constraint

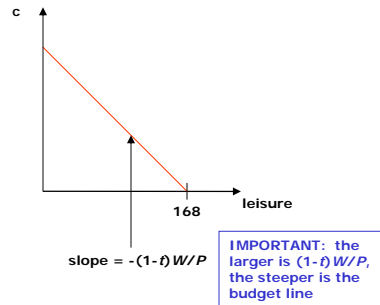
Spending on  $c_1$     Spending on  $c_2$     A constant from the point of view of the individual

## CONSUMER OPTIMIZATION

- **Consumer’s decision problem:** maximize utility subject to budget constraint – bring together both **cost** side and **benefit** side
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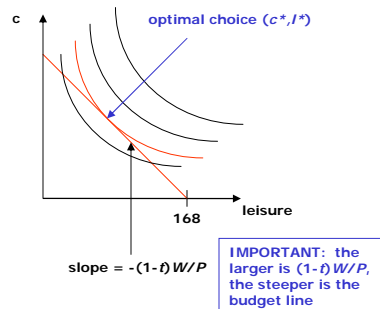
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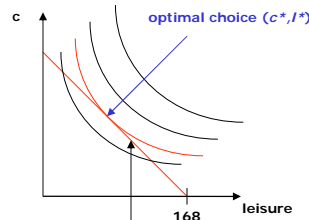
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CONSUMPTION-LEISURE  
OPTIMALITY CONDITION  
- A key building block of  
modern macro models

$$\frac{u_l(c^*, l^*)}{u_c(c^*, l^*)} = \frac{(1-t)W}{P}$$

slope =  $-(1-t)W/P$

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

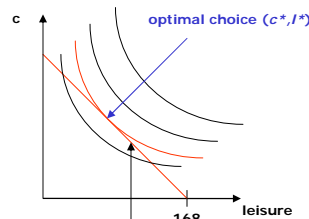
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MRS (between consumption and leisure)
price ratio (inclusive of taxes)

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## REAL WAGE

- $W/P$  a key variable for macroeconomic analysis
- Unit Analysis (i.e., analyze algebraic units of variables)
  - Units( $W$ ) = \$/hour of work
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- Economic decisions depend on *real wages* ( $W/P$ ), not nominal wages ( $W$ )
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- 2008: nominal  $P$  (CPI) rose by 0.1%, nominal  $W$  rose by 2.9%
  - Real wages rose in 2008...but doesn't mean real *income* rose