CONSUMPTION-LABOR FRAMEWORK
(aka CONSUMPTION-LEISURE FRAMEWORK)

SEPTEMBER 9, 2014

BASICS

- **Consumption-Leisure Framework – provides foundation for**
  - **Labor-market supply function**
  - **Goods-market demand function**
  - **An application of the basic consumer theory model…**
  - **…we will put a macro interpretation on it**
  - **Only one time period – no "future" for which to save**

- **Notation**
  - ***c*: consumption ("all stuff")**
  - ***n*: number of hours spent working**
  - ***l*: number of hours leisure (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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n + *l* = 168

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n + *l* = 720

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n + *l* = 8,760

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  - Just need to take SOME stand on the length of a "period"

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n + *l* = 1

- "Weekly," "monthly," "yearly" is a detail
  - Just need to take SOME stand on the length of a "period"
  - *n* + *l* = 1 → *n* (*l*) is the *percentage* of time working (in leisure)

BASICS

- Building blocks of consumption-leisure framework
- Utility
  - Describes the benefits of engaging in labor market (and other) activities
- Budget constraint
  - Describes the costs of engaging in labor market (and other) activities
- Utility and budgets two ***DISTINCT*** concepts
  - As in basic consumer analysis (Chapter 1)
- Only after describing utility and budgets separately do we bring the two together to obtain predictions from the framework

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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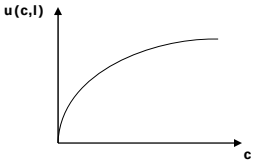
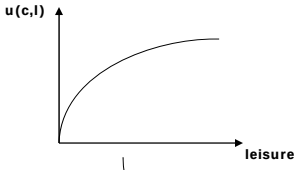
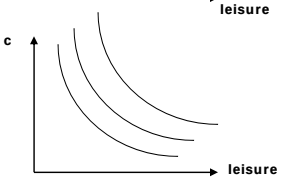




  - Plotted as indifference curves



  - Utility side of consumption-leisure framework identical to Chapter 1 framework

BUDGET CONSTRAINT

- Consumer must work for his/her income
  - *Y* no longer "falls from the sky"

$$Pc = Y$$

$Y = (1-t)Wn$ (all income is after-tax labor income)

$$Pc = (1-t)Wn$$

$n = 1 - l$

$$Pc = (1-t)W(1-l)$$

Rearrange

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

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

Chapter 1 budget constraint

$$P_1c_1 + P_2c_2 = Y$$

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(After-tax) wage is *opportunity cost* of leisure, hence the "price" of leisure

- opportunity costs *are real economic costs / prices*

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

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

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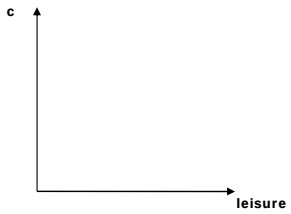
CONSUMER OPTIMIZATION

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



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Isolate *c* to graph the budget constraint

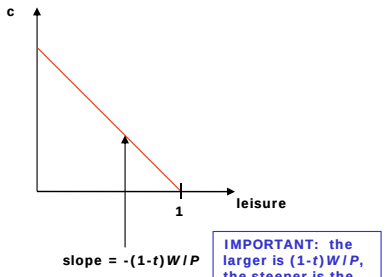
$$Pc+(1-t)Wl=(1-t)W$$

$$\downarrow$$

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

$$\downarrow$$

$$c=-\left(\frac{(1-t)W}{P}\right)l+\frac{(1-t)W}{P}$$



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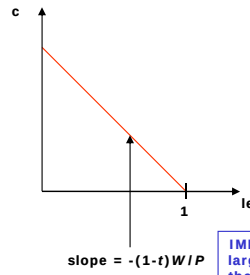

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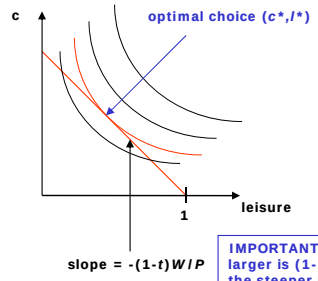

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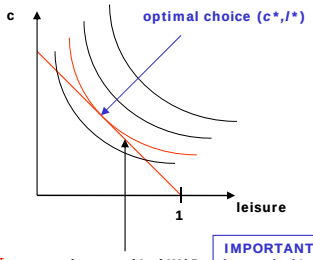

- At the optimal choice

CONSUMPTION-LEISURE OPTIMALITY CONDITION

- A key building block of modern macro models

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

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

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

REAL WAGE

- ***W / P*** **a crucial measure for macroeconomic analysis**
- **Unit Analysis (i.e., analyze algebraic units of variables)**
  - **Units(*W*) = $ / hour of work**
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$$= \frac{\text{unit of consumption}}{\text{hour of work}}$$

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Will usually denote as *w* (lower-case…)

- **Economic decisions depend on *real* wages (*W / P*), not nominal wages (*W*)**
  - **Measures the purchasing power of (nominal) wage earnings…**
  - **…which is presumably what people most care about**