ECON501:
Advanced Microeconomic Theory 1.

Simon Grant, Rice University

Fall Semester 2007

Preliminaries

Instructor: Simon Grant, BB252, ph 3332, email: sgrant@rice.edu

Time and location: MWF 9-10:15, BB271

Office hours: Monday 1-3pm, BB252

Text: *Microeconomic Theory* by Andreu Mas-Colell, Michael D. Whinston and Jerry R. Green, Oxford University Press, 1995.

Other useful texts:

A Course in Microeconomic Theory by David M. Kreps, Harvester Wheatsheaf, 1990.

Microeconomic Analysis by Hal R. Varian, 3rd edition, W W Norton & Co., 1992.

Preliminaries cont.

Assessment:
There will be (almost) weekly problem sets.
And mid-term and final examinations.

Exams will count toward the grade as follows.

		Date
Midterm	30%	Nov 10
Final	70%.	Dec 15

Problem Sets:
Handed out on Monday.
Due Wednesday week.

Topics

1. CONSUMER THEORY AND DEMAND (4 weeks)

2. CHOICE UNDER UNCERTAINTY (2 weeks)

3. PRODUCTION AND COST (2 weeks)

4. PARTIAL EQUILIBRIUM ANALYSIS (2 week)

Q. What do economists study? What do they do?

Explain phonemena

e.g. Why does baseball union dislike revenue sharing?

Predict phonemena

e.g. What will happen to pharmaceutical company as patent expires

Evaluate phonemena

e.g. What are the welfare consequences of prescription drug plan?

Q. What do economists study? What do they do?

Key unit of analysis = individuals

"methodological individualism"

Could do others

— classes (sociology)

— multiple selves (psychology)

key explanation method ≡   rational choice model

Q. What do economists study? What do they do?

$$\boxed{\text{data arising from choice}} \longleftrightarrow \boxed{\begin{array}{c}\text{explain} \approx \text{'rationalize'} \\ \text{in terms of preference } \succsim\end{array}}$$

- Jack & Jill preferred chance of getting water
  (even at risk of falling down and breaking their crowns).

- Alternatively:- explain observation via 'behavioral' non-rational model

$\rightarrow$ irrational urge to go up the hill!!!

Put individual choice together: *aggregate*

— competitive environments

— strategic environments

If we put almost no *structure* on model of preference
(say just some ordering $\succsim$)

Then model predicts little

— too few restrictions on data
— hard to falsify; hard to predict

As add structure on model of preferences

e.g. $\succsim$ comes from maximization of a utility fn of a particular form.

Then *TRADE OFF*

- *good news*: estimate parameters of utility fn
  - make prediction tighter, assess welfare

- *bad news*: might be *too* restrictive/ wrong restrictions i.e. falsified.

Main Lesson

1. What kind of structure on $\succsim$ model

$$\Leftrightarrow \text{ what kind of phenomena in data}$$

2. What kind of structure is 'useful'?

   A. Depends on kinds of data available/questions we want to address

   sometimes data $\rightarrow$ structure we are forced to assume

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Theory of Rational Choice

$$\boxed{\text{data}} = \text{\textit{choice correspondence}}$$

$X =$ set of objects/alternatives

Formally, I observe "Budget Sets" B, from which agents choose.

e.g. {apple, pear, lemon}

And I observe choice $c(B) \subseteq B$.

Theory of Rational Choice

Let $\mathcal{B}$ be set of budgets I see agent choose from.

$$\boxed{\text{data}} = (\mathcal{B},\ c(\cdot))$$

Assume $c(B) \neq \varnothing$ (i.e. agent always chooses something).

$$\boxed{\text{Explanation}} = \boxed{\text{Preference relation, } \succsim, \text{ on } X}$$

$x \succsim y : x$ is weakly preferred to y

$x \succ y : \ x$ is *strictly* preferred to y (i.e. $x \succsim y$ AND NOT$(y \succsim x)$)

$x \sim y : \ x$ is *indifferent* to y (i.e. $x \succsim y$ AND $y \succsim x$)

Only structure on $\succsim$

- *completeness:* for all x, y in $X : x \succsim y$ OR $y \succsim x$ (or both)
- *transitivity:* if $x \succsim y$ AND $y \succsim z$ then $x \succsim z$.

What does explaining 'choice' by 'preference' mean?

> The choice data $(\mathcal{B},\ c(\cdot))$ is *explained* by
> the rational $\succsim$ if for each choice problem B in $\mathcal{B}$
> $c(B) = \{x \in B : x \succsim y \text{ for all } y \text{ in } B\}$.
>
> I.e. $c(B) =$ set of most preferred elements of B.

Questions

What has to be true of choice data for there
to exist a rational $\succsim$ that explains it?

Can the rational choice model be falsified?

Can we predict anything at all?

Suppose x was chosen when y was available: i.e. x, y in B and $x \in c\left(B\right)$.

Then we say "x is *weakly* revealed preferred to y" (or x *wrp* y)

If in addition, y was *not* chosen, i.e. $y \notin c\left(B\right)$,

Then we say ""x is *strictly* revealed preferred to y" (or x *srp* y)

CLAIM *The following property of the data* $(\mathcal{B}, \ c\left(\cdot\right))$ *is necessary for it to be explained by a rational* $\succsim$.

WARP If x weakly revealed preferred to y in some (observed) choice problem then y cannot be strictly revealed preferred to x in some other (observed) choice problem.

Amazing Fact

If our data is rich enough (it includes all subsets of X with three or fewer elements) then *WARP* is *sufficient* for data to be explained by a rational $\succsim$.

Q. Why do we need rich data?

A. More data $\Rightarrow$ *WARP* is more of a restriction.

Usually don't have enough data!

$\Rightarrow$ need a stronger 'transitivity' requirement [*SARP*]

Example: $X = \{x, y, z\}$, $\mathcal{B} = \{\{x, y\}, \{y, z\}, \{x, z\}\}$,

$c\left(\{x, y\}\right) = x$, $c\left(\{y, z\}\right) = y$ and $c\left(\{x, z\}\right) = z$,

satisfies *WARP* but violates transitivity.

Special Case: Consumer Theory

$X = \mathbb{R}^{\mathrm{L}}_+$, $\mathcal{B} = $ linear budget sets (p, w) $\left(\left\{x \in \mathbb{R}^{\mathrm{L}}_+ : p.x \leq w\right\}\right.$

$c(B) = x(p, w)$ demand function.

For now assume

1. $x(p, w)$ is unique

2. $x(p, w)$ is on budget line (i.e. $p.x(p, w) \left[= \sum_{\ell} p_{\ell} x_{\ell}\right] = w$.

CLAIM *WARP implies compensated demand curves slope down.*

See picture for intuition.

N.B. Downward sloping compensated demand only requires minimal structural assumptions.

Welfare Analysis

Suppose we compare US "standard of living" with other countries.

One approach: compare per capita GDP at PPP exchange rate.

Pblm: relative prices differ across countries, hence consumption vectors vary

e.g. housing cheap in Australia, expensive in Holland.

Another approach: use *WARP*.

Assume

1. each country has a representative consumer

2. same preferences in each country

Welfare Analysis

Ask:

1. Could country i (representative) consumer have afforded
   to consume country j's bundle?

2. Could country j (representative) consumer have afforded
   to consume country i's bundle?

If (Yes, No) then i's bundle RP to j's

If (No, No) then *no comparison.*

If (Yes, Yes) then contradicts underlying assumptions.

Welfare Analysis

Revealed Preference Approach to Inter-Country Welfare Comparisons

References:

DOWRICK, STEVE AND JOHN QUIGGIN (1993), "Australia, Japan and the OECD: GDP Rankings and Revealed Preference," *Australian Economic Review* 101, 21-33.

——————(1994), "International Comparisons of Living Standards and Tastes: A Revealed Preference Analysis," *American Economic Review* 84, 332-341.

——————(1997), "True Measures of GDP and Convergence," *American Economic Review* 87, 41-64.