Applied Microeconomics: Firm and Household

Introduction

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September 6, 2016

Cost/benefit search theory (Stigler, 1961)

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The cost/benefit search theory:

"*To maximize his utility, the buyer searches for additional prices until the expected saving from the purchase equals the cost of visiting one more delaer. Then he stops searching, and buys from the dealer who quotes the lowest price he has encountered, (Stigler, 1961 p.2)* "

The cost/benefit search theory

A noneconomist would critique that

1. Where did the utility maximization come from?
2. What exactly is the cost of search — shopping is pleasant for some people and distasteful to others?
3. The rule doesn't say how many dealers the buyer will visit, it just says the buyer will visit as many dealers as he visits.

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An economist would answer:

Meaningful economic theories enable us to predict how consumers (and firms, and markets) will behave.

Let's consider some basic predictions of Stigler's theory to assess the strength of the noneconomist's objections.

Predictions of Stigler's cost/benefit search theory

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Both of these predictions (hypothesis) are testable (refutable).

For the theory to pass these test, the **dominant tendency of consumers** must be to search to a degree governed by costs and expected returns, and act sensibly on the information.

A test of the theory

Commodity	Average Price	Coefficient of Variation
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The data supports the prediction. However, it is important to keep in mind that

- there are many other datasets we could use to test this prediction,
- there could be many other testable predictions,
- there could be competing theories that may provide better (or worse) predictions.

Not only should a competent scientist not accept theories on faith, but all evidence for a given theory is provisional. Our views should be subject to change in light of better data or better models.

Applied economic analysis

Throughout the semester we will focus on the essentials of conducting applied research in economics.

Our main objective is to study the development of **conceptual frameworks** and **economic models**, and to discuss the **analytical methods** we can use to provide **economic explanations** for social phenomena.

Economic facts vs. economic explanations

In the real world we observe various interesting social changes or trends (**economic facts**), e.g.:

- The size of the average farm is increasing (e.g., dairy farms), while the number of farms is decreasing.
- Farmers' transactions in spot markets are being replaced by contracts with first level handlers (processors, wholesalers).
- Obesity has become a global problem.
- Food and agricultural markets are heavily regulated.

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The act of **economic explanation** is interpreting the observed facts (data) via a general proposition (microeconomic theory) consisting a set of rules that provide guiding principles (a conceptual framework) that can be used to interpret and explain other data sets.

Performing economic explanation

We perform economic explanations using **economic theory** to establish a common conceptual framework, **mathematics** to build economic models that relate our theoretical constructs to real objects, and **econometrics/mathematics** to analyze data and test the theory or hypothesis empirically.

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Economic theory $\rightarrow$ Provides conceptual framework

Math $\rightarrow$ Used to build models based on the theory

Econometrics/Math $\rightarrow$ Used to analyze data$\rightarrow$test hypothesis/theory

(Mainstream economic theory comes from the **marginalist paradigm**.)

The structure of economic theories

- Assertions/postulates (not observable)
  - e.g. consumers maximize utility, firms maximize profits
- Assumptions and test conditions (realistic, observable)
  - e.g. functional form specification for utility/cost/profit
    - Common assuptions: linear, Cobb-Douglas. Translogarithmic
  - changes in opportunities/constraints
    - e.g., income increase, price decrease, new subsidies and/or taxes
- Events (observed behavioral outcomes)
  - e.g. falling consumption, adopting new technology, increasing production

We first make behavioral postulates that are not observable, then we try to explain observed behavior by based on in observable constraints under realistic assumptions.

Economic models

A model relates theoretical constructs to real objects. Every economic model consists of two classes of variables:

- Decision or choice variables (endogenous variables).
  - These represent observed behavioral outcomes. Variables that are under control of the economic agent such as consumption or production.
- Parameters (exogenous variables).
  - These represent constraints/opportunities, and test conditions. Parameters are not under control of the economic agent, e.g. prices (under perfect competition), income (in a model with no labor supply decision), taxes (if we are not including political economy in our model).
  - Notice that most (all?) parameters can be *endogenized* - a richer model can turn them into choice variables. This comes at a cost in terms of simplicity, tractability, and, often, usefulness.

The Marginalist Paradigm (the theory of choice)

Modern economic anlayses are based on the marginalist paradigm, which is built on the theory of choice.

The basic postulate of the **theory of choice** is that individual behavior is fundamentally characterized by individual choices/decisions.

In most cases we can observe individual choices. For example, we can observe consumers' individual consumption bundles. Similarly, we can collect data on the input choices of farmers (type and quantity of seed, fertilizer,...etc).

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Q: How can we systematically analyze individual behavior using observed choices? That is, how can we make *predictions* of individual behavior?

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A: First we need to understand the determinants of individual choice.

The theory of choice asserts that, individual choice can be conceived to be determined by:

- Tastes and preferences
- Opportunities/constraints

The determinants of individual choice

- Tastes and preferences
  - the hypothetical exchange a person is willing to make at various terms of trade.
  - not observable, not measurable (vegetarian, environmentalist).
  - we impose structure on individual preferences
  - this structure comes from assertions such as ”more is better”, ”people mitigate/reduce the impact of constraints.”

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We typically assume that individual tastes do not change in the course of a giiven study. Then we can attribute changes in individual behavior to changes in opportunities/constraints.

Question: Why do we limit our analysis to marginal reasoning rather than total?

An Example

Consider a consumer's choices of x where the decision variable is assumed to be a function of parameters α and β:

- $x = f(\alpha, \beta)$

Where $f(\cdot, \cdot)$ is some continuously differentiable function with two arguments. This model predicts that if the test conditions $\alpha = \alpha_0$ and $\beta = \beta_0$ hold, then the consumer will choose $x_0 = f(\alpha_0, \beta_0)$.

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Q: Can we test the relation $x = f(\alpha, \beta)$ directly?

A: Almost definitely not! Testing whether $x = f(\alpha, \beta)$ requires full knowledge of all possible decisions x and their determinants α and β. If α or β is unobservable (e.g., tastes), then we cannot test $x = f(\alpha, \beta)$ directly. Even if we can directly observe x, α, and β over some range of values, we can only test for this functional form over the observed range of values.

Applied economic analysis

"*Meaningful theorems in economics consist not in laying out equilibrium conditions which are rarely observable and therefore empirically sterile, but in deriving predictions that the direction of change of some decision variable in response to a change in some observable parameter must be in some particular direction.*"

Paul Samuelson.

Comparative statics

In many economic problems we are interested in knowing how optimal decisions change when a parameter in the problem changes.

- how does the optimum consumption bundle of a consumer change when the price of one good changes?
- how does the optimum production level of a firm change when a tax on the product changes?

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Previous example continued:

Consider the previous example. Even if we cannot test $x = f(\alpha, \beta)$ directly, we can measure and test changes in x using calculus. Assume that $f(.)$ is a differentiable function, then a potentially refutable hypothesis is:

- $\frac{dx}{d\alpha} = f_\alpha(\alpha, \beta) \gtreqless 0$