EKN-812 Lecture 5

Elements of Supply

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The Firm and Profit Maximization

- market responses (to shocks, natural disasters, changes in policy) consist of both demand and supply!
  - aggregate supply responses are built up from firm behavior
- *supply curve*: set of quantities of a given product
  - that would be provided by a group of firms
  - under given conditions
  - at varying prices
- often we would want to interpret "quantity" as the quantity per unit time
  - makes continuity much more plausible!

The Firm and Profit Maximization

- what is a "firm"?
  - an intermediary between product and factor markets?
  - an organization which does *not* use the price mechanism internally?
    - Coase (1937) famously made this argument
    - if markets are so efficient, why do firms exist?
    - but, this definition would include households as firms, too
- usually, we assume firms try to maximize profits
  - important extensions: utility maximization
    - nonprofit firms (hospitals, universities)
    - state-owned enterprises or regulated utilities
  - what sort of objectives would we expect these organizations to pursue?

The Firm and Profit Maximization

- what do we mean by "competition"?
  - price-taking behavior
  - has *nothing* to do with market shares or the number of firms
  - can have competitive behavior even with one incumbent firm!
    - "contestable" markets
    - partly depends on how narrowly you define a "market" (hairdressers, restaurants)
- if all supply decisions are independent of each other, market supply = sum of firm supplies
  - need to incorporate extensive margin decisions (firm entry)
  - we will discuss failures of independence (externalities) later

Costs

- let $c(y)$ be total costs, as they depend on (the rate of) output y
  - $c'(y)$ is *marginal cost*
  - $c(y)/y$ is *average cost*
  - as you know, average costs are increasing whenever $c'(y) > c(y)/y$
- the exact relation between supply and cost curves depends on a firm's objectives
  - profits are maximized where MR = MC
    - for a competitive firm, MR = price
- under the assumption of profit maximization, the firm's supply curve is its marginal cost curve
  - where $c''(y) > 0$ (MC is increasing)
  - and where MC > min AC (at least in the long run)
- if MC is constant, supply decisions are indeterminate at firm level
  - have to get aggregate quantity from market-clearing condition

Costs

- of course, we could think of other objectives
  - e.g. if the firm's owners get some benefit from output itself: $u(\pi(p, y), y)$
- key difference with consumers:
  - we typically have some idea of what the "outside options" are, i.e. shutting down!
  - and, profit maximization is a specific type of "utility" function
  - we don't impose a budget constraint on firms
    - no income effects in producer theory!
    - this absence reflects an assumption that firms have free access to capital markets

Rents

- firms may differ in their costs
  - even in the long run, some firms may earn economic profits
- if the superior resources can be traded, they could be counted as a "cost" too
  - taxi (or mining) licenses
  - especially fertile land
  - a specialized piece of capital equipment
  - is "entrepreneurial talent" an exception?
- in a sense, profits are always zero
  - but, this is a tautology!
  - also, rents are determined by output prices, not the reverse (why?)
  - so, for the purposes of analyzing market outcomes, we can think of rents as a type of outcome, not a cause

Short-Run and Long-Run Supply

- costs do not depend only on (the rate of) output
  - can depend on the total volume of output
    - serving several hundred meals a day for a weekend vs a year
  - could also depend on fluctuations in the rate of output
    - e.g. intraday fluctuations in Netflix use
- usually, the cost of using inputs depends (negatively) on expected duration of use
  - setup or transaction costs are a typical source of this dependence
- distinction between fixed and variable factors is not a purely technological one
  - depends on the legal or institutional environment too
  - e.g. have to search to find suppliers;
  - may face legal obstacles to hiring or firing

Short-Run and Long-Run Supply

- how should we expect firms to respond to temporary vs permanent demand shocks?
  - typically, expect to use more "variable" factors for temporary shocks
    - unskilled labor
    - raw materials
  - for permanent shocks, may be worth finding skilled workers, building extra capacity, etc
- what is the relationship between short-run and long-run marginal costs?
  - can derive this formally using the envelope theorem
    - let $\overline{c}(y) \geq c(y)$ be the short-run cost function; $c(y)$ are long-run costs
    - $\overline{y}$ is some output level
    - the difference $\overline{c}(y) - c(y)$ has a minimum of 0 at $\overline{y}$
    - so, $\overline{c}'(\overline{y}) = c'(\overline{y})$ and $\overline{c}''(\overline{y}) \geq c''(\overline{y})$

Externalities

- distinguish between *real* and *pecuniary* externalities
  - pecuniary externalities: my actions have effects on prices
  - real externalities: my actions have effects on others' (real) costs
    - we are taking costs as given here, but effects on factor prices would be pecuniary externalities too
- say we have $c_i(y_i, y_j)$ so that j's output decision affects my costs
  - suppose firms affect each other symmetrically so $y_i = s_i(p, Y)$
  - here, Y is industry output
  - the equilibrium condition is $Y = \sum_{i=1}^{N} s_i(p, Y)$
- can show that:
  - if $\partial s_i / \partial Y > 0$, industry supply is more elastic than otherwise
    - this is the case of "positive externalities": others' output lowers my marginal cost
  - opposite happens if Y raises my marginal costs: industry supply is *less* price-elastic

References

Coase, Ronald H. 1937. "The Nature of the Firm." *Economica* 4 (16): 386. https://doi.org/10.2307/2626876.

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