Economics Notes: Production and Costs

Introduction

Firm: organization or enterprise formed by profit-seeking entrepreneurs who bring together factors of production to produce goods or services for sale to consumers

Plant: physical location where factors of production are gathered for the purpose of producing goods or services (responsible for production only)

Industry: group of firms that produce a single good or service, or a group of related goods or services

Explicit costs: direct payments made to outside suppliers of input
- Wages, prices of raw materials, sunk costs

Implicit costs: costs which do not involve direct payment of money to a third party, but which nevertheless involves a sacrifice of some alternative
- Salary forgone by

Accounting costs: monetary value of explicit costs of production
Economic costs: monetary value of explicit + implicit costs of production

Firms: profit-maximizing by nature (revenue – economic cost) to survive in competitive environment
- Supernormal profit: TR > TC, AR > AC
- Normal profit: TR = TC, AR = AC
- Subnormal profit (loss): TR < TC, AR < AC

Other objectives of firms:
- Managerial theories of firm behavior
    - For larger firms, ownership belongs to shareholders while control of operations is largely dependent on directors and managers (with different objectives)
    - Principal-agent problem
        - Shareholders: profit maximization
        - Managers: sales revenue/growth maximization, staff benefits
- Satisficing behavior
    - Even more complex environment with owners, managers, workers, consumers (each with their own self-interest to maximize)
    - Sole focus cannot be on profit maximization
- Nationalized industries
    - Social and political objectives to consider
    - Seek to maximize social welfare and achieve allocative efficiency
- Imperfect information
    - Real world, lack of detailed information on demand and cost conditions
- Social enterprise
    - Instead of maximizing shareholder value, social enterprises aim to generate profit to further social or environmental goals (profit is viewed as means and not a primary goal)

Production (Short Run)

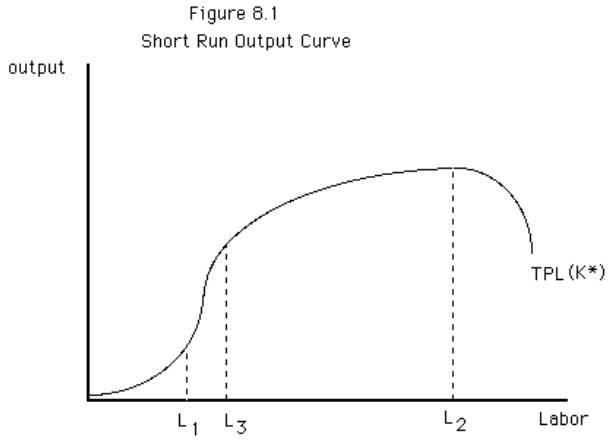
Definition: short run is a time period with at least one fixed factor of production (differs between industries)
Fixed Factor: input that cannot be increased in supply in short run (machines, land)
Variable Factor: input that can be increased in supply in short run (labour, raw materials)

Law of Diminishing Marginal Returns: as more units of a variable factor are applied to a given quantity of a fixed factor, there comes a point beyond which each additional unit of variable factor adds less to total output than the previous unit of variable factor

Stage 1: increasing marginal output (total output rises at increasing rate)
- Division of labour and specialization of tasks

Stage 2: decreasing marginal output (total output still increases but at decreasing rate)
- Overcrowding arises and fixed factor is over-utilized
- Law of Diminishing Marginal Returns
- Marginal Output still positive

Stage 3: total output decreases (marginal output is negative and decreasing)
- Law of Diminishing Marginal Returns



Fixed Cost: cost that does not vary with output level (paid even when production does not occur)
Variable Cost: cost that varies with output level
Total Cost: sum of costs of all factors of production (TFC + TVC)
Average Cost: cost per unit of output (AVC, AFC and ATC)
Marginal Cost: cost incurred in producing an additional unit of output

AFC Curve: continuously downward sloping (constant TFC spread over larger quantities of output)
AVC Curve: U-shaped
- Increasing marginal return leads to initial decrease in AVC
- Subsequent increase in AVC due to decreasing marginal returns

ATC Curve: U-shaped (summation of AFC and AVC curves)
- NOTE: minimum point of ATC curve is to the right of AVC curve
- ATC and AVC converges as Q increases

MC Curve: U-shaped
- If MC > AVC/ATC, AVC/ATC will increase
- If MC < AVC/ATC, AVC/ATC will decrease
- NOTE: at the stage where AVC is increasing but ATC decreasing, MC is in between AVC and ATC

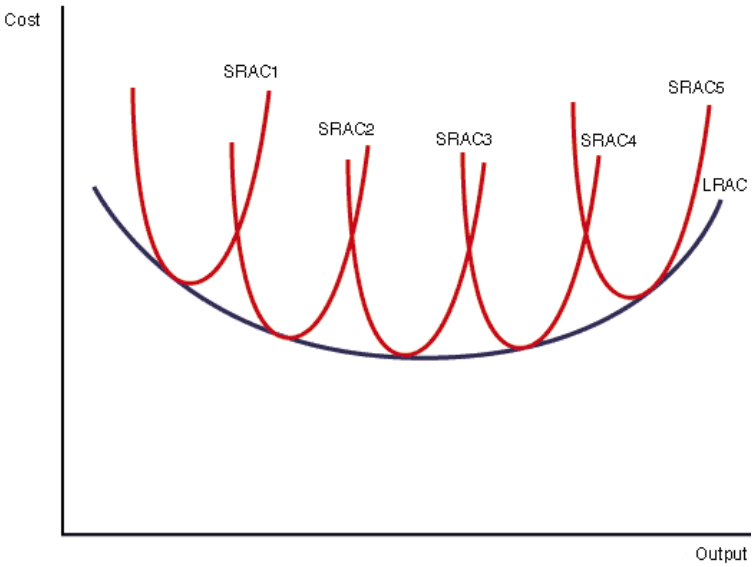
Production (Long Run)

Definition: time period where all factors of production can be varied except for level of technology

Returns to Scale: what happens when all factors of production are raised by the same proportion
- Increasing returns to scale: output increases more than proportionately to increase in inputs
  - Falling section of LRAC curve due to technical economies of scale
- Constant returns to scale: output increases proportionately to increase in inputs
- Decreasing returns to scale: output increases less than proportionately to increase in inputs
  - Rising section of LRAC curve due to technical diseconomies of scale

LRAC Curve:
- Typically U-shaped
  - Average costs fall due to internal economies of scale (falling part of LRAC)

    - Average costs subsequently rise due to internal diseconomies of scale (rising part of LRAC)
    - LRAC will not rise sharply since size of firm can be increased to deal with output increase
        - Average costs lower in LRAC than SRAC for a given level of output (flatter)



- Minimum efficient scale: optimal level of output where LRAC is at minimum
- NOTE: LRAC curve is tangent to one point on the SRAC
- NOTE: SRAC can only be tangent to LRAC at its minimum point when LRAC is also at its minimum

Internal Economies of Scale (IEOS): savings in costs due to firm expansion (firm's own policies and actions)

- Technical Economies of Scale: directly relate to production process
    - **Factor indivisibility**: some inputs are of minimum size (large and costly) and cannot be used fully if output is small (plant operating below maximum capacity)
    - **Law of increased dimensions**: increased efficiency of machines and equipment with larger dimensions (like oil tankers reducing average cost of transportation with increased size)
    - **Specialization and division of labour**: simple and more repetitive jobs, less training needed
    - **Linked Process Economies**: integration of processes in one firm (save time, transport costs and energy)
    - **By Product Economies**: larger plants can offer better utilization of products
- Managerial Economies of Scale:
    - Increase productivity by employing specialists to supervise production systems
    - Raise productivity and creates efficient and cost effective management processes
- Marketing/Commercial Economies:
    - Large firms have bargaining advantage by buying in bulk (unit cost lower)
    - Economies in selling: bulk advertising and large scale promotion (more spread out costs)
- Financial Economies:
    - Easier and cheaper to raise funds for large firms due to better credit rating
    - Public listed companies can issue bonds and borrow money at lower interest rates
- Research and Development Economies:
    - Can afford to build laboratories and employ researchers
    - Such facilities have high initial capital outlay
- Welfare Economies:
    - Efficiency of workers can be increased by improving working conditions
    - Larger firms can afford amenities and programmes to encourage higher productivity
- Risk-bearing Economies:
    - Large firms can spread uncertainty in cost of production over large level of output
    - Wide variety of products in many geographic locations (spread risk, average costs low)
- Economies of Scope:
    - Large firms can increase the type of products they produce

Internal Diseconomies of Scale (IDOS): increases in costs due to firm expansion

- Complexity of management

    - Principal-agent problem: incentive for managers to reduce costs diminishes
    - Long chain of authority leads to rigid organization, thus loss of efficiency due to red-tape
- Strained relationships
    - Impersonal relationships between management and employees
    - Loss of loyalty to firm, sloppy work attitudes and apathy

External Economies of Scale: expansion of industry/concentration of firms in one location

❖ Entire LRAC curve shifts downwards (reduced cost at every output level)

- Economies of Concentration
    - **Availability of Skilled Labour:**
        - Demand for skill is large enough, special educational institutions set up to train people in such skills (firms pool resources)
    - **Well-developed Infrastructure:**
        - Better facilities set up to cater for the industries in one area
    - **Reputation:**
        - Large and well-established industry builds up a name which consumers associate with quality, increased brand loyalty and steady clientele (ie Silicon Valley)
- Economies of Disintegration
    - Subsidiary industries are developed to cater to needs of the major industry (supporting firm)
- Economies of Information
    - Publication of trade journals improves productivity of firms in the industry
    - Research and expertise concentrated to reduce costs (or government provision)

External Diseconomies of Scale:

❖ Entire LRAC curve shifts upwards (increased cost at every output level)

- Increased strain on infrastructure
    - Localization of activities leads to overtaxed infrastructure (ie traffic congestion)
- Rising factor costs
    - Larger industries leads to growing shortage of specific raw materials/skilled labour
    - Push up prices due to competition for resources, increase in firm's costs

MES and Number of Firms:

- MES large relative to market demand, can only have a few large efficiently sized firms
- MES small relative to market demand, high degree of competition with many efficiently sized firms

Growth of Firms

Measurement of Size:

1. Quantity of output sold
2. Total annual revenue
3. Market share: proportion of firm's revenue in the market
4. Amount of real assets owned by firm
5. Number of employees

Motives for Growth:

- Exploit available internal economies of scale (lower unit cost hence lower prices to edge out rivals)
- Greater economies of scale (larger range of products and markets)
- Greater market share (market power)
- Increase market valuation
- Reduce risk of takeover

Methods of Growth:

- **Growth by Internal Expansion**
    - Firm grows within the framework of existing management and control structure
    - Finance internal expansion by ploughing back profits, borrowing money or IPO
- **Growth by Merger or Acquisition**
    - Vertical Integration
        - Backward integration: merging with firm involved in previous stage of production
            - Greater control over quantity and quality of raw materials
            - Restrict availability of supplies to competitor
            - Absorb immediate profit margin
        - Forward integration: merging with firm in succeeding stages of production
            - Secure adequate number of market outlets
            - Reap greater economies in production
            - Accelerate development of new discoveries
    - Horizontal Integration: merging with similar firm at same stage of production
        - Market domination: reducing competition and increasing market power
        - Greater internal economies of scale and lowering unit costs
    - Conglomerates: combination of firms not directly related to one another
        - Reduce risk of fluctuations by diversifying output
        - Ensures long-term growth
- **Growth by Franchising**
    - Franchising: right to use of a firm's successful business model and brand for prescribed period of time (supplier who allows operator to use trademark and distribute goods in return for a fee)

Existence of Small Firms

<u>Demand side factors:</u>

- **Nature of product**: perishables, preference for variety, specialized product with limited markets
- **Prestige markets**: limited by price (sports cars, luxury yachts)
- **Personalized services:** impossible to have mass production
- **Geographical limitations**

<u>Supply side factors:</u>

- **Reaching MES at low output levels:** small firms when diseconomies occur at low output levels
- **Low entry barriers**: easy for small firm to set up in industries where costs are low
- **Vertical disintegration**: production process is broken up into series of separate processes
- **Lack of capital:** expansion and large scale production require funds
- **Unwillingness to take greater risks**: risk of investment is grater
- **Banding:** small independent businesses band together to gain EOS while retaining independence
- **Profit-cycles:** needs time to grow and outpace rivals (at infancy of firm)
- **Non-profit maximization**: motivated by self-employment or prestige to have small business

Co-existence of Firms:

- Nature of industry LRAC curve: Firms can be cost-efficient over range of output
    - Small and large firms can be equally cost efficient and coexist
- Segmented market: small firms can cater to niche markets when industry caters to a diversified range of products and customers
- Disintegrated production process: small firms specialize in single process and make components for the larger firms
- Joint ventures: cooperation among smaller firms to protect interests
- Technological progress: recent developments favour small firms (small scale equipment)