

Producers in the Long Run

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Time Horizon and Decision Making

- Short run - some factors are fixed
 - Decide costs into variable and fixed costs
 - Companies decide to produce or not and how much
- Long Run - all productive factors can be changed
 - Factories can be built or resized
 - Companies may enter or exit markets
- Very Long Run
 - Technology changes both intentionally and unintentionally

Short Run Cost Curves

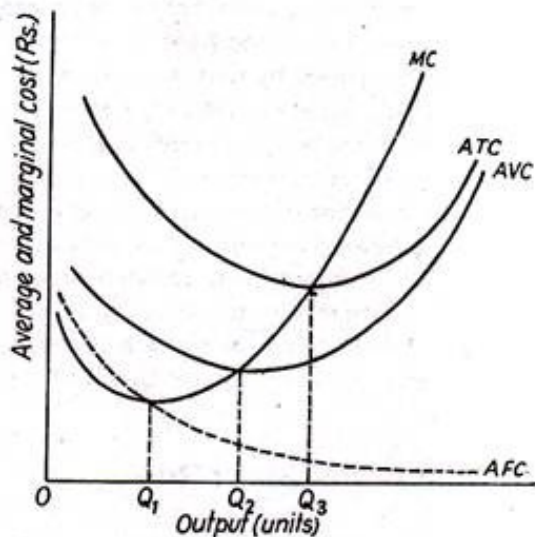


Figure 14.4 Short-run average and marginal cost curves

The Long Run: No Fixed Factors

- Long Run - firms choose how much capital and labour to use in production
- Profit maximization and labour to use in production
 - Cost minimisation - choosing the least costly way produce a given quantity of output
 - Profit maximization also requires selling the correct amount of output to produce

Marginal Productivity

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Marginal Productivity

- Long run cost minimization - equate marginal productivity per dollar spent across categories

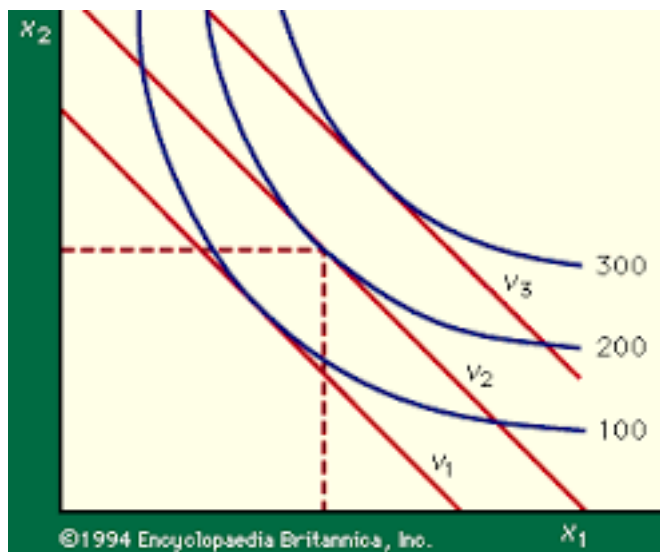
- $$\frac{MP_K}{P_K} = \frac{MP_L}{P_L}$$

- If this was not true - adjust use of capital and labour to reduce costs

Principle of Substitution

- If input price changes, firms will adjust production to use more of the relatively cheaper input, and less of the relatively more expensive factor
- Very similar to substitution effects in chapter 6
- Lots of examples
 - Banks automating as wages increase, computing costs decline
 - Production in countries with low wages uses more labour, less capital

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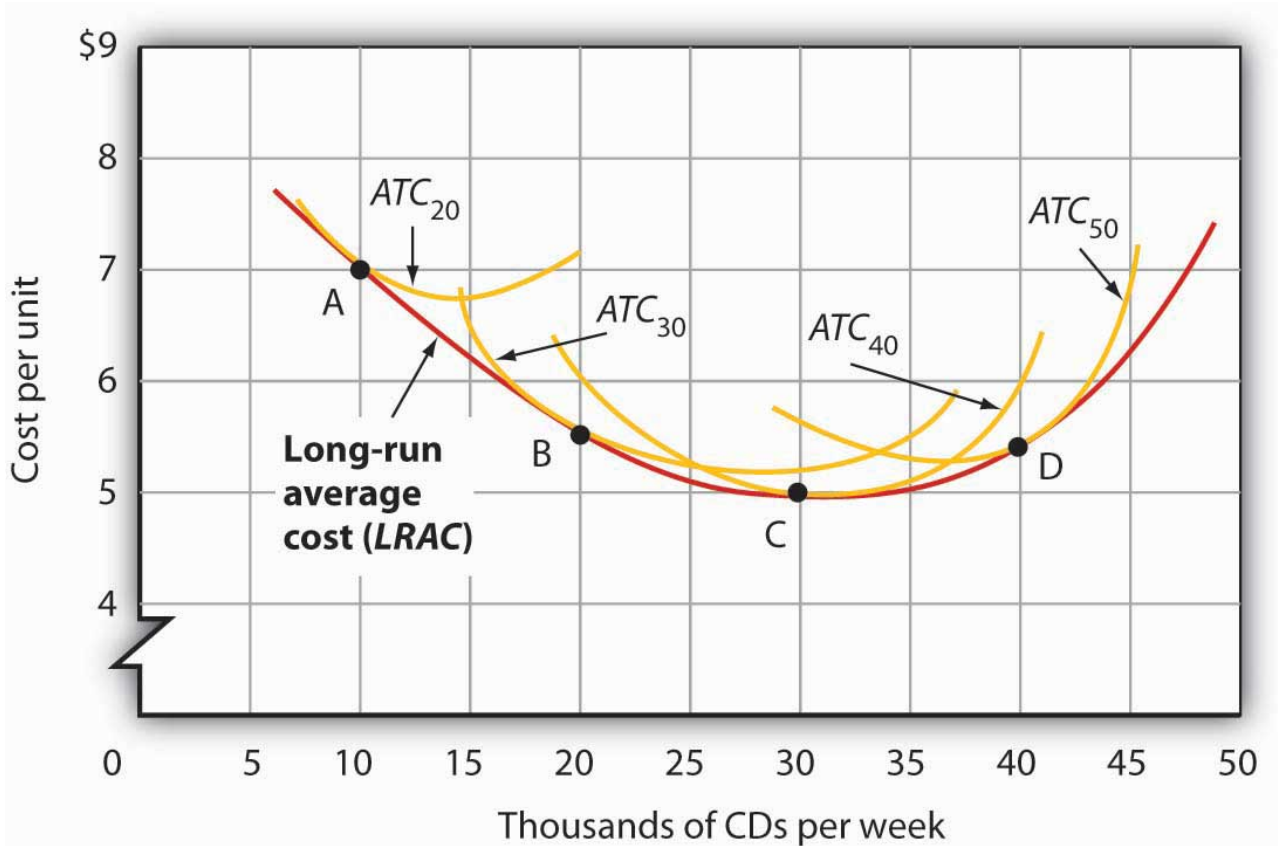


Substitution

- Marginal rate of substitution - ability to switch between inputs holding output constant
- Very similar to marginal rate of substitution in consumer theory
- Changes in relative prices cause a shift to relatively cheaper inputs

Long Run Average Total Cost Curves

- Short run ATC curves generally U-shaped
 - Firms can only adjust labour
- Long run - firms can also adjust capital
 - Can choose between a wide variety of short run ATC curves
 - Eg. Different curves for a company with one factory, two factories or three factories



Very Long Run: Technology

- Short run - firms vary labour inputs
 - Choose one spot on a short run ATC curve
- Long Run - firms choose how much capital and labour to use in production
 - Choose one spot on a long run ATC curve
- Very long run - firms can change technology
 - Change the long-run ATC curve
- Wide range of options for firms
 - Lower costs, or increase capacity
 - Produce entirely new products

Technology Change and Long Run Growth

- Technological change considered core driver of long run economic growth
- Overall measures of technology growth are difficult - focus on productivity (output per

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Overall measures of technology growth are difficult - focus on productivity (output per employed worker)

- Rate of growth of productivity in Canada lower than in the US or UK

Technology Change

- Technology change can be demand driven
 - New products or modifications to existing products
- Technology change can be driven by supply factors
 - Changing production techniques to use fewer or cheaper inputs
 - Improving the quality of inputs may lower costs or alter products
- Government policy can affect technology change
 - Patent Law
 - Subsidized or private research (tax incentives, universities, etc.)

Long Run or Very Long Run

- How do firms respond to changes in the price of inputs, such as wages?
- Automation - substitute to capital through automation
- Outsourcing - substitute to labour in another country
- Innovation - develop new production techniques that use less labour or produce more output for a given amount of labour

