

## Economies of scale

In microeconomics, economies of scale are the cost advantages that enterprises obtain due to size, output, or scale of operation, with cost per unit of output generally decreasing with increasing scale as fixed costs are spread out over more units of output.

Economies of scale apply to a variety of organizational and business situations and at various levels, such as a business or manufacturing unit, plant or an entire enterprise. For example, economies of scale apply to the fixed cost to produce units of output through production and manufacturing. When average costs start falling then economies of scale are in production with fixed costs being a requirement for the equation. With no fixed costs, the average cost and average variable cost would be equal. Economies of scale exist in real life. Some economies of scale, such as capital cost of manufacturing facilities and friction loss of transportation and industrial equipment, have a physical or engineering basis.

The economic concept dates back to Adam Smith and the idea of obtaining larger production returns through the use of division of labor. Diseconomies of scale are the opposite.

Economies of scale often have limits, such as passing the optimum design point where costs per additional unit begin to increase. Common limits include exceeding the nearby raw material supply, such as wood in the lumber, pulp and paper industry. A common limit for low cost per unit weight commodities is saturating the regional market, thus having to ship product uneconomical distances. Other limits include using energy less efficiently or having a higher defect rate.

Large producers are usually efficient at long runs of a product grade (a commodity) and find it costly to switch grades frequently. They will therefore avoid specialty grades even though they have higher margins. Often smaller (usually older) manufacturing facilities remain viable by changing from commodity grade production to specialty products.

The simple meaning of economies of scale is doing things more efficiently with increasing size or speed of operation. Economies of scale often rely on fixed cost which are constant and don't vary with output, and variable costs which can be effected with the amount of output. In wholesale and retail distribution, increasing the speed of operations, such as order fulfillment, lowers the cost of both fixed and working capital. Other common sources of economies of scale are purchasing (bulk buying of materials through long-term contracts), managerial (increasing the specialization of managers), financial (obtaining lower-interest charges when borrowing from banks and having access to a greater range of financial instruments), marketing (spreading the cost of advertising over a greater range of output in media markets), and technological (taking advantage of returns to scale in the production function). Each of these factors reduces the long run

average costs (LRAC) of production by shifting the short-run average total cost (SRATC) curve down and to the right.

Economies of the scale is a practical concept that may explain real world phenomena such as patterns of international trade or the number of firms in a market. The exploitation of economies of scale helps explain why companies grow large in some industries. It is also a justification for free trade policies, since some economies of scale may require a larger market than is possible within a particular country—for example, it would not be efficient for Liechtenstein to have its own car maker, if they only sold to their local market. A lone car maker may be profitable, but even more so if they exported cars to global markets in addition to selling to the local market. Economies of scale also play a role in a "natural monopoly". There is a distinction between two types of economies of scale: internal and external. An industry that exhibits an internal economy of scale is one where the costs of production falls when the number of firms in the industry drops, but the remaining firms increase their production to match previous levels. Conversely, an industry exhibits an external economy of scale when costs drop due to the introduction of more firms, thus allowing for more efficient use of specialized services and machinery. The management thinker and translator of the Toyota Production System for service, Professor John Seddon, argues that attempting to create economies by increasing scale is powered by myth in the service sector. Instead, he believes that economies will come from improving the flow of a service, from first receipt of a customer's demand to the eventual satisfaction of that demand. In trying to manage and reduce unit costs, firms often raise total costs by creating failure demand. Seddon claims that arguments for economy of scale are a mix of:

- a) the plausibly obvious and
- b) a little hard data, brought together to produce two broad assertions, for which there is little hard factual evidence.