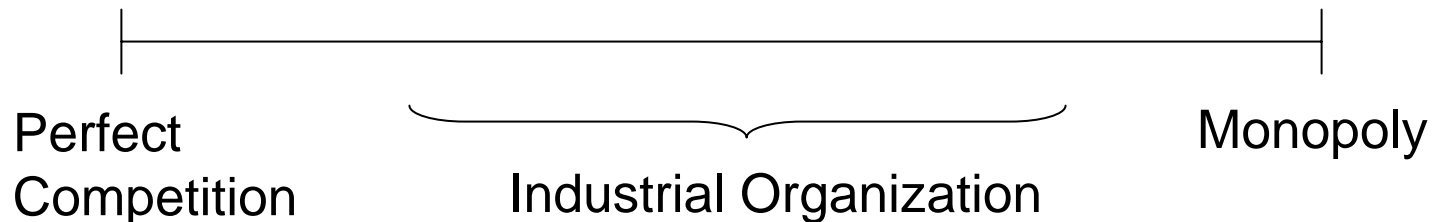


Industrial Organization.

Industrial organization (IO) is concerned with the workings of markets and industries.

We'll study the way firms interact and compete with each other.



Firms.

General Motors

- 335,000 employees.
- Plants in 30 countries.
- Sales to ~200 countries.
- Equity and debt financing.

Caffe Strada

- ~15 employees
- Single location.
- Privately owned.

What do GM and CS have in common?

- They both transform inputs (steel, coffee beans) into outputs (vehicles, coffee drinks).
- They both make decisions about pricing, new product introductions, marketing, etc.
- They both have a handful of competitors (e.g. Ford, Jimmy Bean's).
- They both make decisions about what to make themselves and what to buy.
 - GM buys seats and makes transmissions. Why?

What are Caffe Strada's costs?

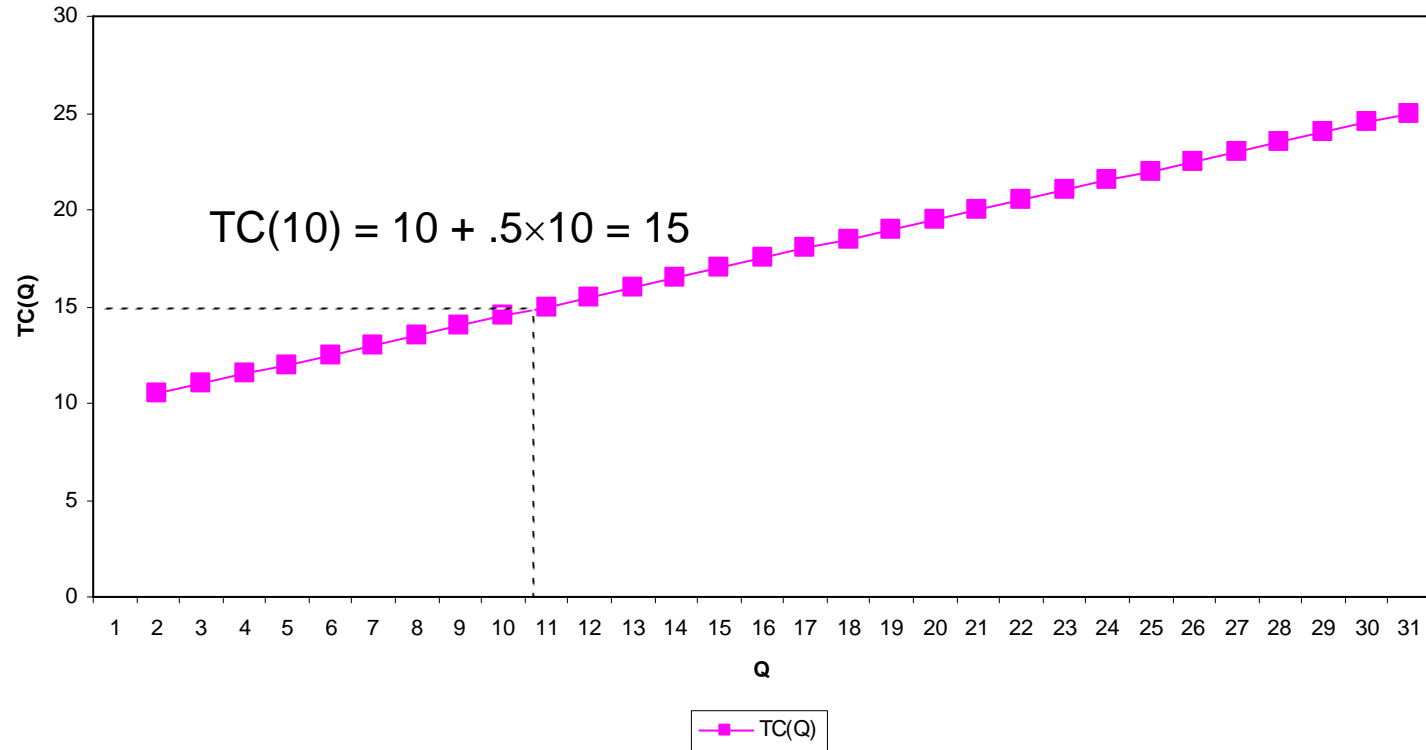
A firm's cost functions.

- Cost functions relate some cost to the quantity a firm produces.
- A firm's cost function may change over time.
- A *total* cost function algebraically:

$$TC(Q) = 10 + .5Q$$

The total cost function graphically.

An example: $TC(Q) = 10 + .5Q$



Fixed and variable costs.

- Fixed costs are independent of the amount produced but are necessary for the firm to remain in business.

Fixed costs = 10 in our example.

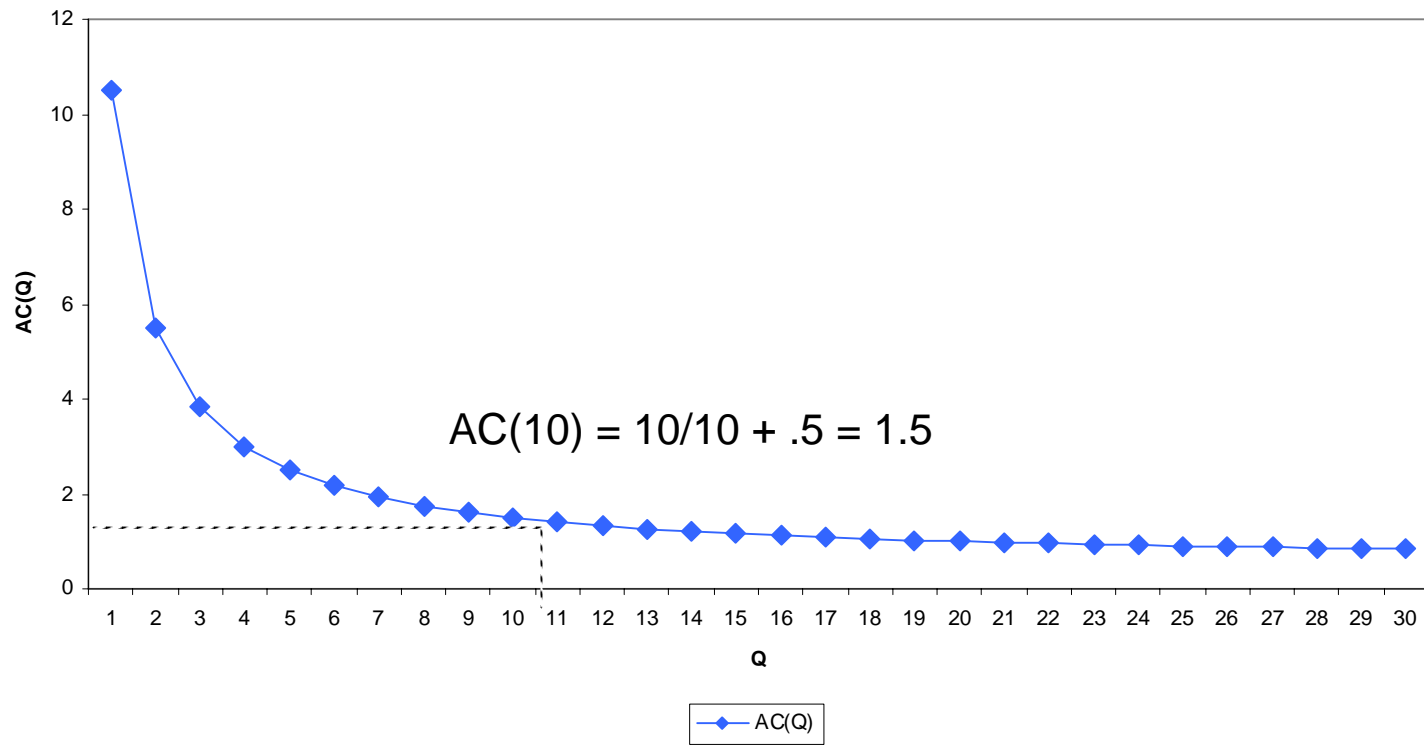
- Variable costs vary with the amount you produce (Q).

Variable costs = $.5Q$ in our example.

- What's fixed and what's variable depends on what Q is.

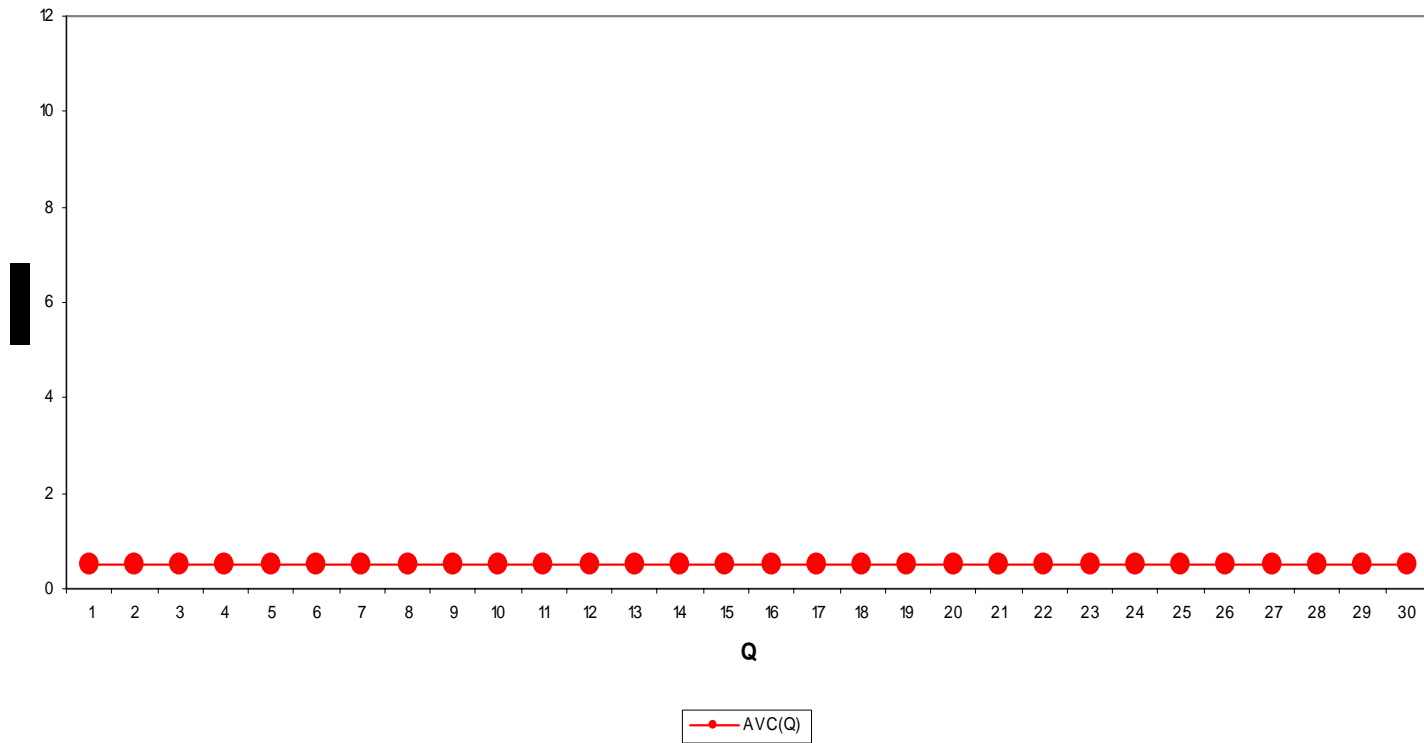
The average cost function.

$$AC(Q) = TC(Q)/Q = 10/Q + .5$$



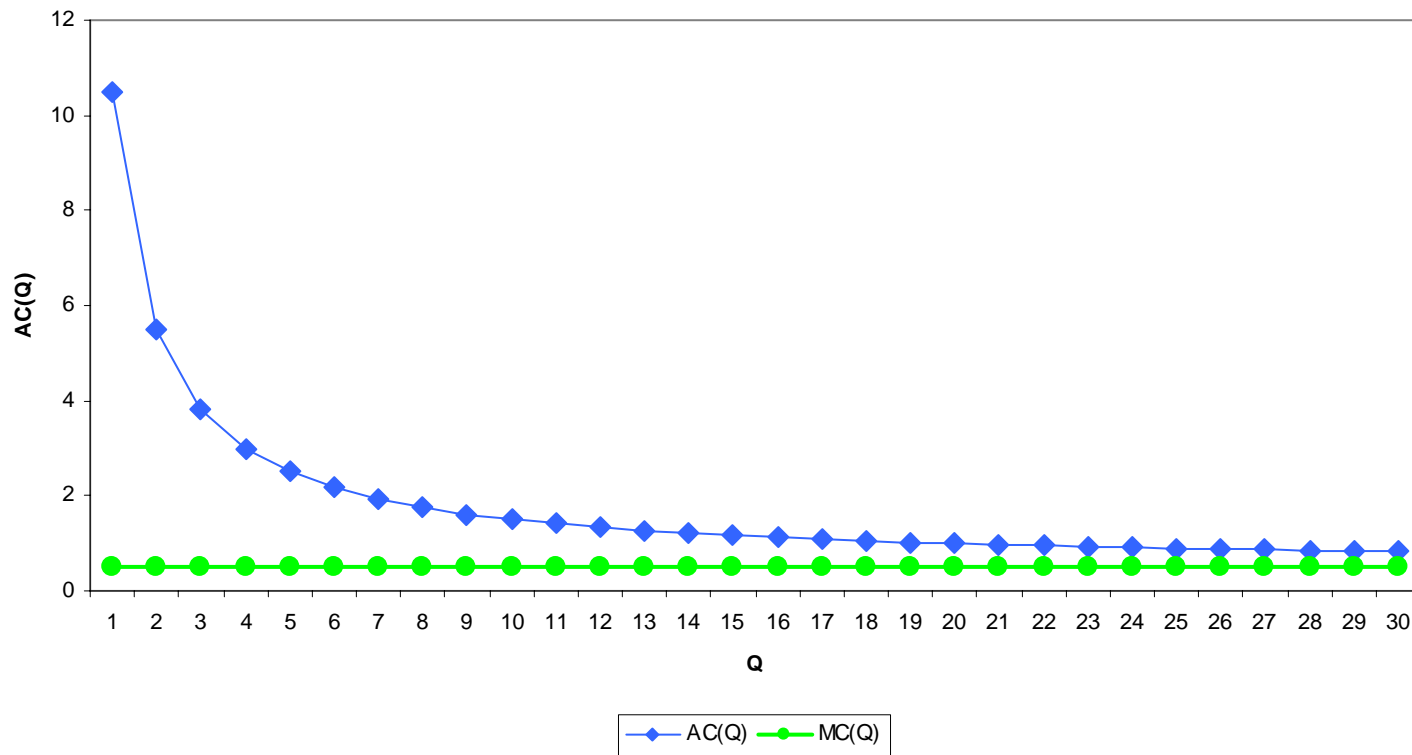
The average variable cost function.

$$AVC(Q) = VC(Q)/Q = .5$$



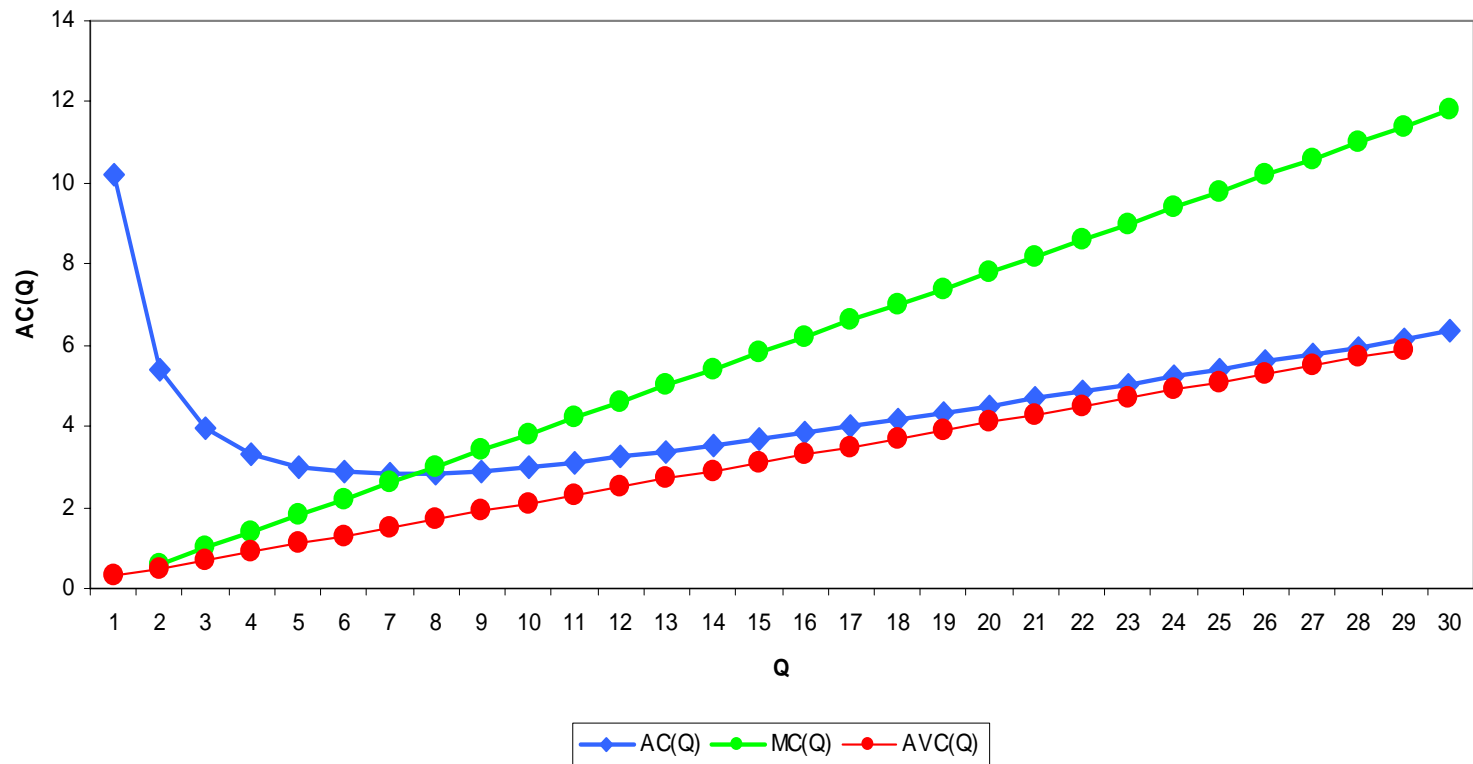
Marginal (or incremental) costs.

$$MC(Q) = dTC(Q)/dQ = .5$$

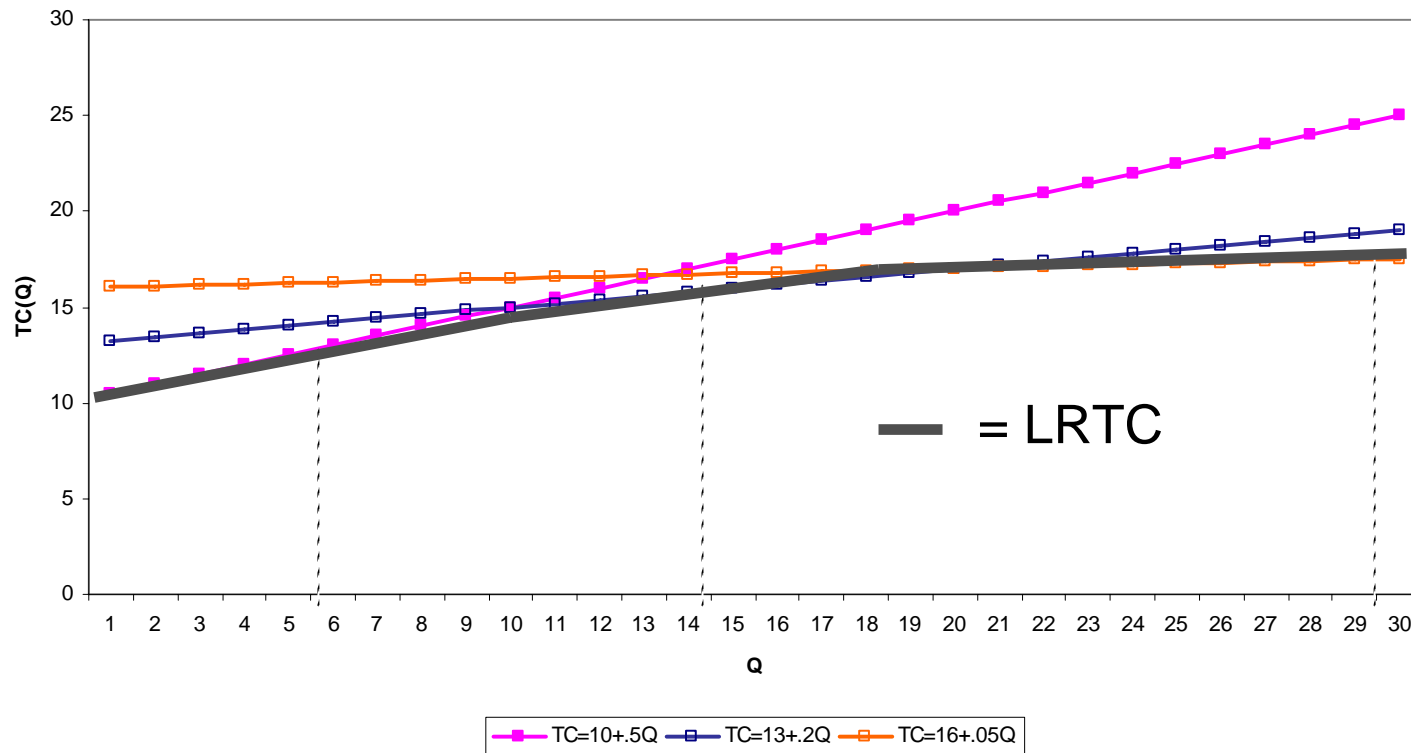


Another cost function.

$$TC(Q) = 10 + .2Q^2; \quad AC = 10/Q + .2Q; \quad AVC = .2Q; \quad MC = .4Q$$



Short run versus long run total costs.



Long run costs are the lower envelope of short run costs.

- In the long run, everything is variable,
- ... so choose the combination that minimizes costs for the relevant production levels.
- Whether you take a short or long-run view of costs depends on what question you're asking.

Recap.

- We've defined:
 - Total, average and marginal costs (TC, AC & MC).
 - Fixed versus variable costs.
- $MC=AC$ when AC is at a minimum.
- The long run total cost function is the lower envelope of short run total cost functions.

Economies of scale.

Economies of scale describe how the firm's *average* costs change as output increases.

- $AC \uparrow$ with quantity = “diseconomies of scale”
- $AC \downarrow$ with quantity = “economies of scale”

Note: a cost function can exhibit economies of scale at some output levels and diseconomies of scale at other output levels.

Economies of scale.

Sources of economies of scale:

Sources of diseconomies of scale:

Opportunity costs.

- Payoffs from an action must be judged against the *best* alternative action.
- When you make a decision, make sure you think of all the possible alternatives,
- ... and think through the implications of each decision (e.g. what possibilities does it foreclose?).

Sunk costs.

- Decisions should be based on the incremental costs of an action.
- What's behind you is not important...

Cost function examples.

- What does the AC curve look like for a firm with no fixed costs and constant MC?
- What if this firm has limited capacity?
- What is the opportunity cost of selling a unit of that good?