Chapter 7
Production and Cost of the Firm

These slides supplement the textbook, but should not replace reading the textbook

When studying production and costs of the firm, what assumption do I make?

Producers always attempt to maximize their profit

When studying the firm, what is the first thing for me to know?

You must have a working knowledge of key terms

What should I do to understand this chapter?

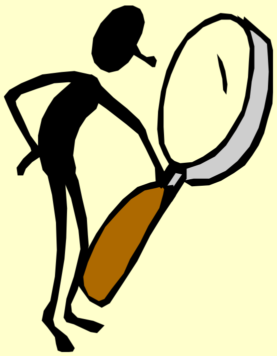
You pretend that you are the owner of a business and you are making decisions to maximize your profit or minimize your losses

What is revenue?

P X Q = total revenue

What is profit?

TR - TC = Profit



What is an explicit cost?

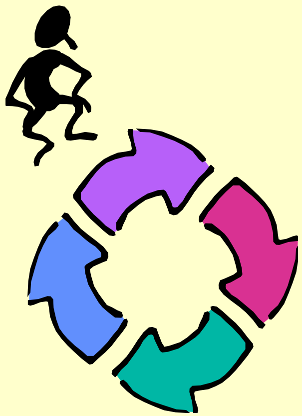
Opportunity cost of a firm's resources that takes the form of cash payments

What is an implicit cost?

A firm’s opportunity cost of using its own resources or those provided by its owners without corresponding cash payment

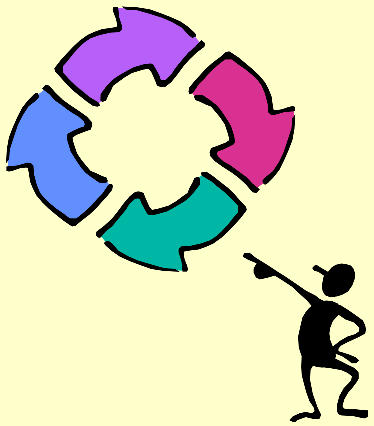
What are total costs?

Explicit costs **+** implicit costs



What is accounting profit?

TR minus explicit costs



What is economic profit?

A firm’s total revenue minus its explicit and implicit costs

What is a fixed resource?

Any production cost that does *not* increase as output increases

What are some examples of fixed resources?

- rent or mortgage
- loan payments
- certain salaries
- a part of utilities
- property taxes

What is a variable cost?

Any production cost that increases as output increases

What is total cost?

The sum of fixed cost and variable cost

FC + VC

Accounts of The Wheeler Dealer

Total revenue…………………………...$90,000

Less explicit costs:

Assistant's salary ………. -$15,000

Material & equipment…..-$20,000

Equals accounting profit…………….$55,000

Less implicit costs:

Wanda's forgone salary……-$40,000

Foregone interest on savings.-$1,000

Forgone garage rental………-$1,200

Equals economic profit……………...$12,800

Exhibit 1

What is normal profit?

The accounting profit earned when all resources used by the firm earn their opportunity cost

Why is normal profit included as part of TC?

Because just as in the payment of wages, normal profit is a necessary expense of running a business

What does it mean that a firm is breaking even?

It is making a normal profit

What is another way I can define economic profit?

Any money made above and beyond your normal profit

What is my marginal revenue?

The money you make by selling the last unit of output

What is my marginal cost?

The change in your total cost resulting from a one-unit change in output

What is the short run?

A period during which at least one of your firm's resources are fixed

What is the long run?

A period during which all your resources under your firm’s control are variable

The short run relationship between units of labor and tons of furniture moved

Variable Resource (labor per day)	Total Product (Tons per day)	Marginal Product (Tons per day)
0	0	-
1	2	2
2	5	3
3	9	4
4	12	3
5	14	2
6	15	1
7	15	0
8	14	-1

Exhibit 2

What is my marginal product?

The change in your total product that occurs when the usage of a resource increases by one unit, all other resources constant

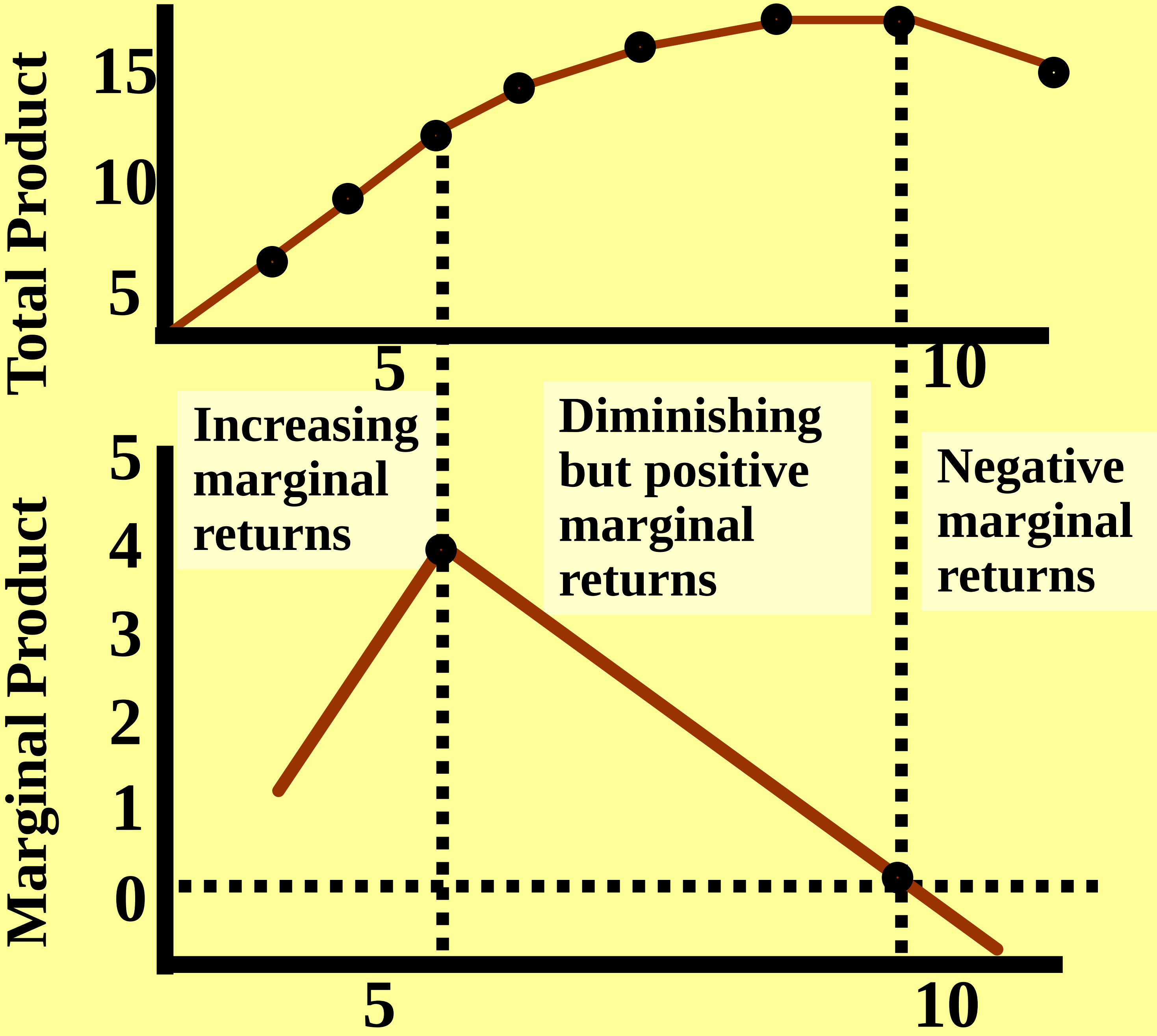
What is increasing marginal returns?

This occurs when your marginal product increases as more units of a resource are employed, all other resources constant

What is the *law of diminishing marginal returns*?

As more units of a variable resource are combined with a given amount of fixed resources, eventually the additional units will yield a smaller marginal product

Exhibit 3: The Total and Marginal Product of Labor



Short-Run Cost Data for the Smoother Mover

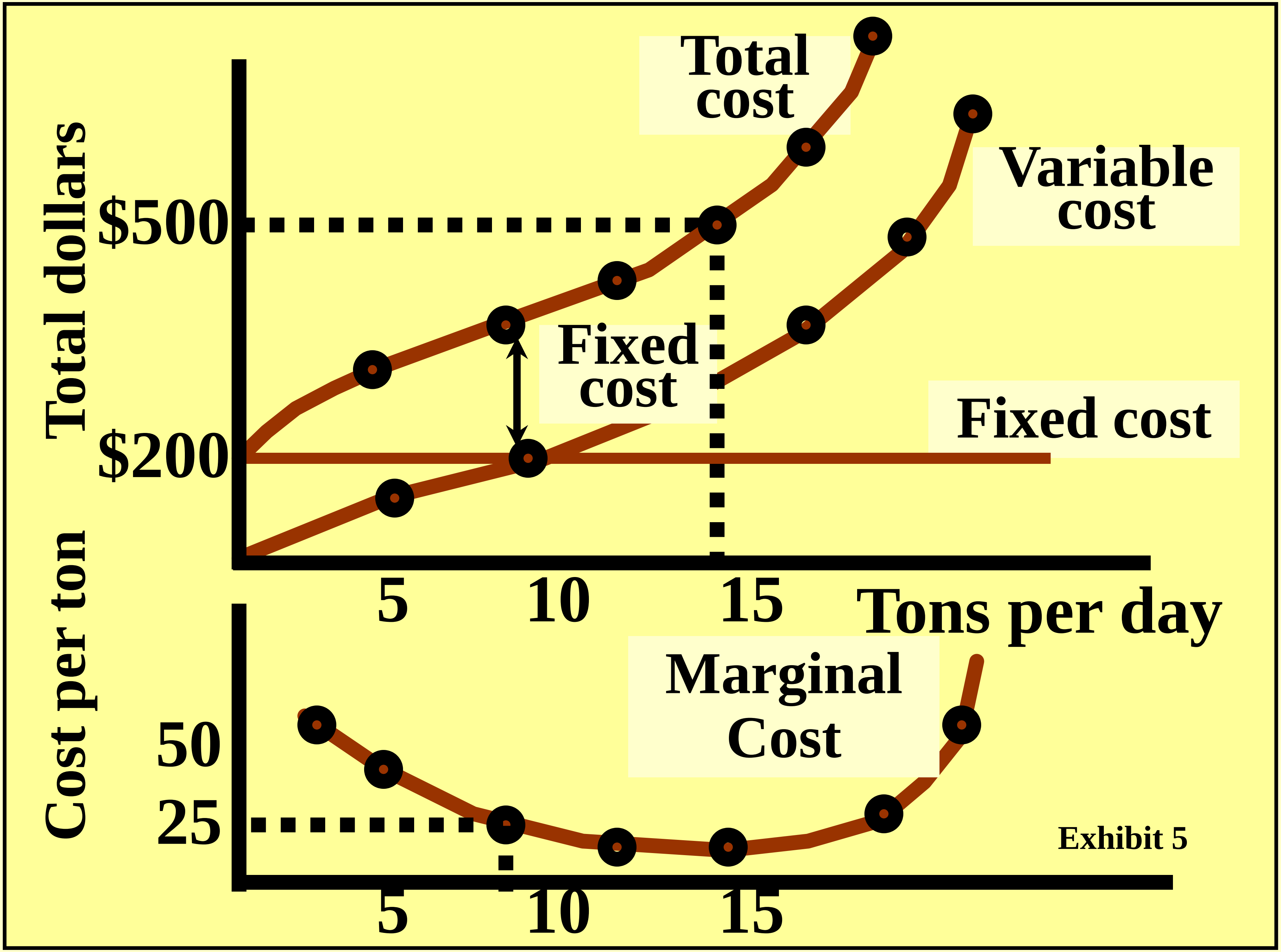
Q_{tons}	FC	$Q_{workers}$	VC	TC	MC
0	$200	0	$0	$200	-
2	$200	1	$100	$300	$50.00
5	$200	2	$200	$400	$33.33
9	$200	3	$300	$500	$25.00
12	$200	4	$400	$600	$33.33
14	$200	5	$500	$700	$50.00
15	$200	6	$600	$800	$100.00

Exhibit 4

When marginal cost increases, does average cost increase?

If MC is > than the average, the average will increase

If MC is < the average, the average will decrease



Total cost
Variable cost
Fixed cost
Fixed cost
Total dollars
$500
$200
5
10
15
Tons per day
Cost per ton
Marginal Cost
50
25
5
10
15
Exhibit 5

What is average fixed cost?

Fixed cost divided by output

$$FC / Q$$

What is average variable cost?

Variable cost divided by Q

$$VC / Q$$

What is average total cost?

Sum of average fixed cost and average variable cost

AFC + AVC

Short-Run Cost Data for the Hypothetical Firm

Q	VC	TC	MC	AFC	AVC	ATC
0	$0	$200	-		-	-
2	100	$300	$50.00	$100	$50.00	$150.00
5	200	$400	$33.33	40.00	40.00	80.00
9	300	$500	$25.00	22.22	33.33	55.55
12	400	$600	$33.33	16.67	33.33	50.00
14	500	$700	$50.00	14.29	35.71	50.00
15	600	$800	$100.00	13.33	40.00	53.33

Exhibit 6

Average & Marginal Cost Curves

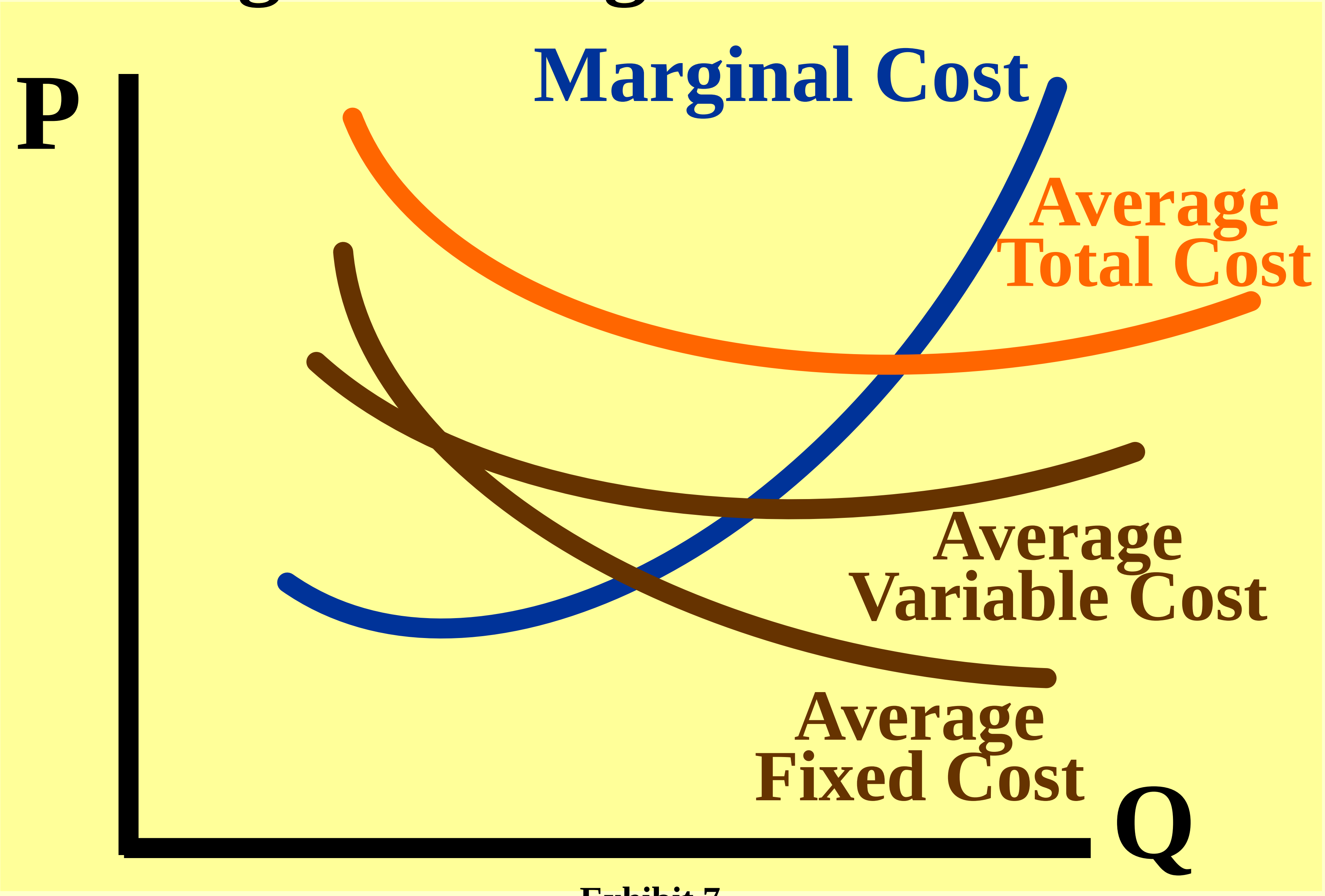


Exhibit 7

What is the long-run average cost curve?

A curve indicating the lowest average cost of production at each level of output when the firm's size is allowed to vary

Short-Run Average Cost Curves and the Long-Run Planning Curve

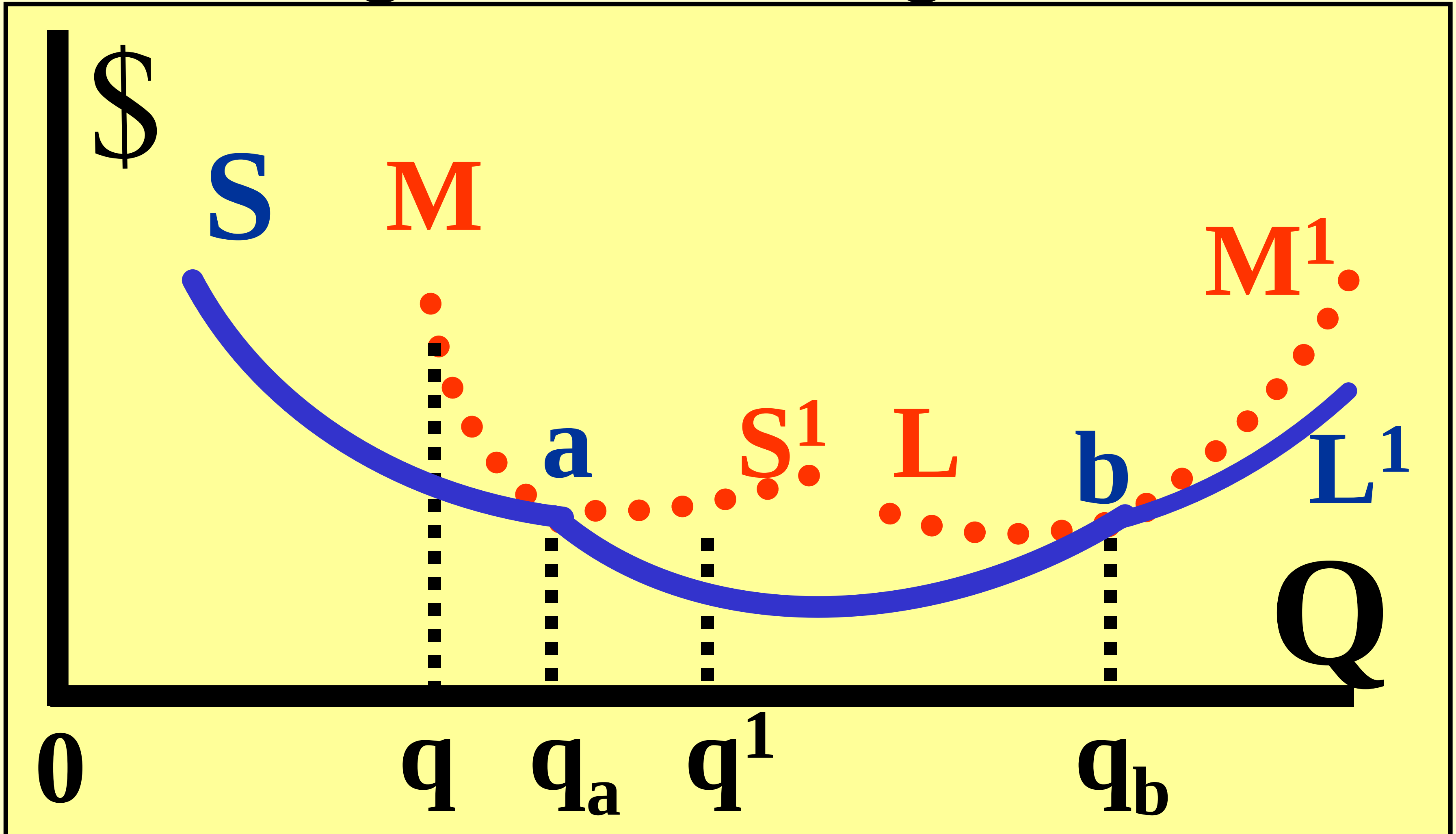


Exhibit 8

Family of Many Short-Run Cost Curves Forming a Firm's Long-Run Planning Curve

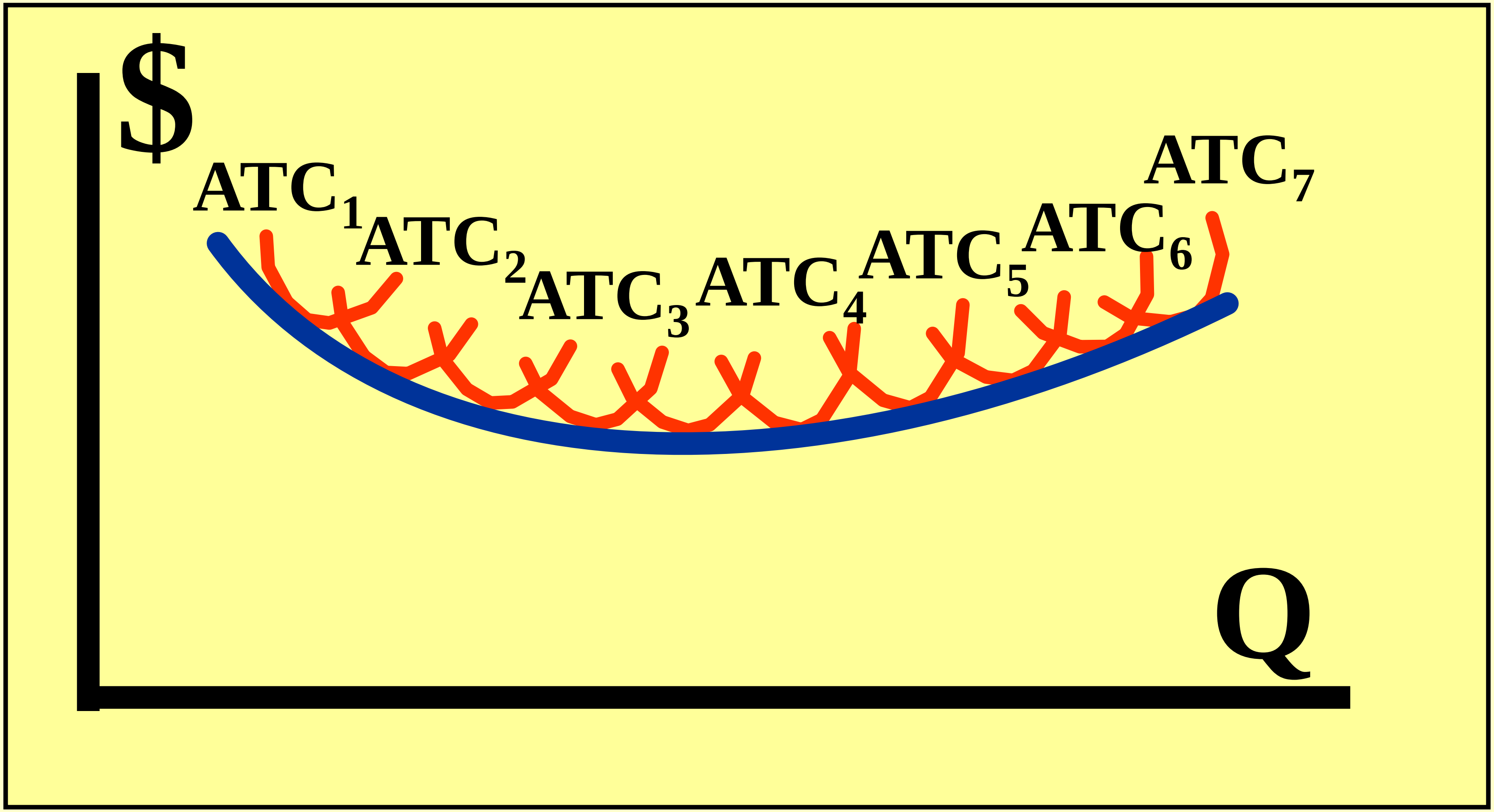


Exhibit 9

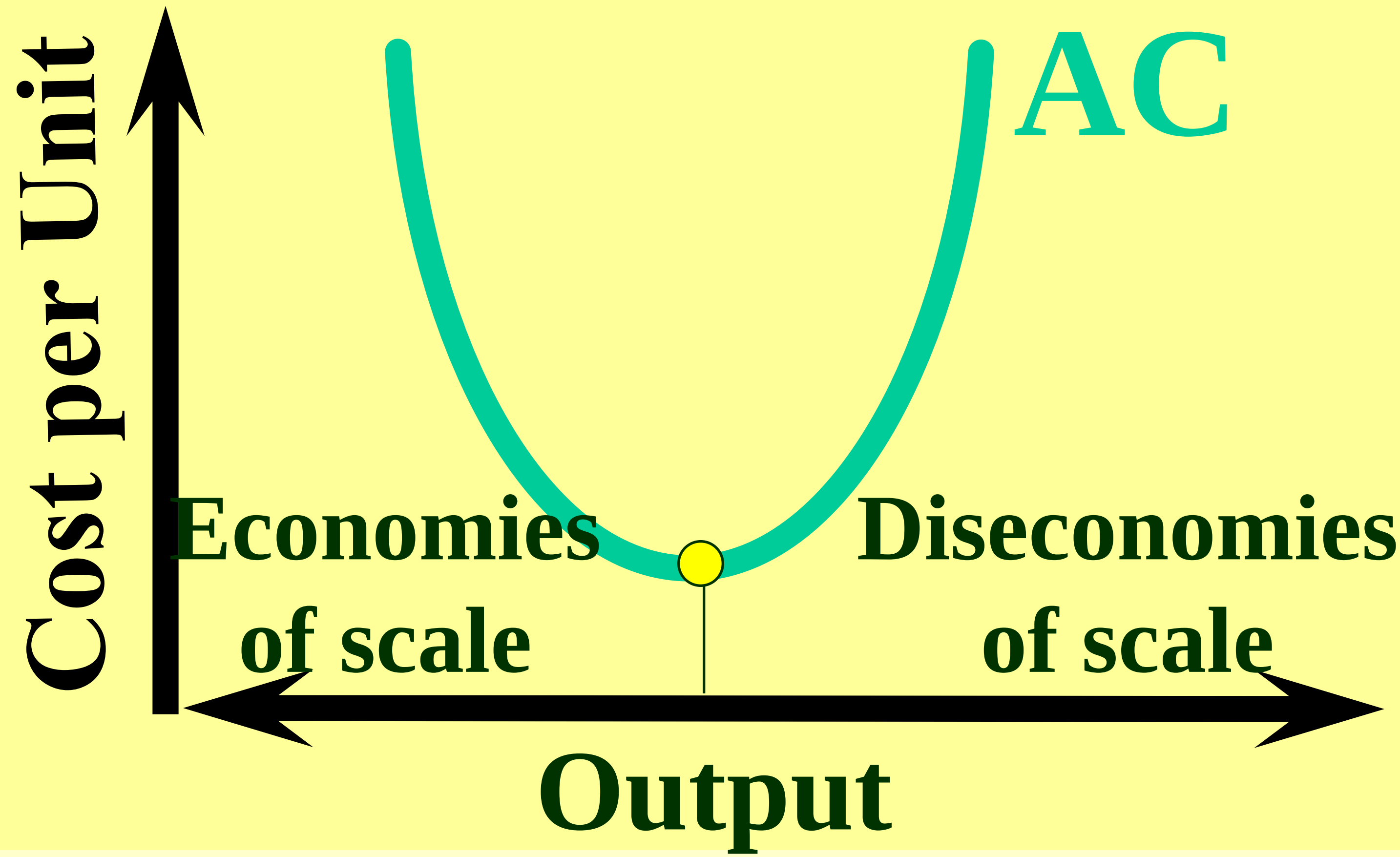
What are economies of scale?

Forces that cause reduction in a firm's average cost as the scale of operation increases in the long run

What are diseconomies of scale?

Forces that cause a firm’s average cost to increase as the scale of operation increases in the long run

Costs in the Long Run and Economies of Scale



What is the minimum efficient scale?

The lowest rate of output at which a firm takes full advantage of economies of scale

Long-run average cost curve

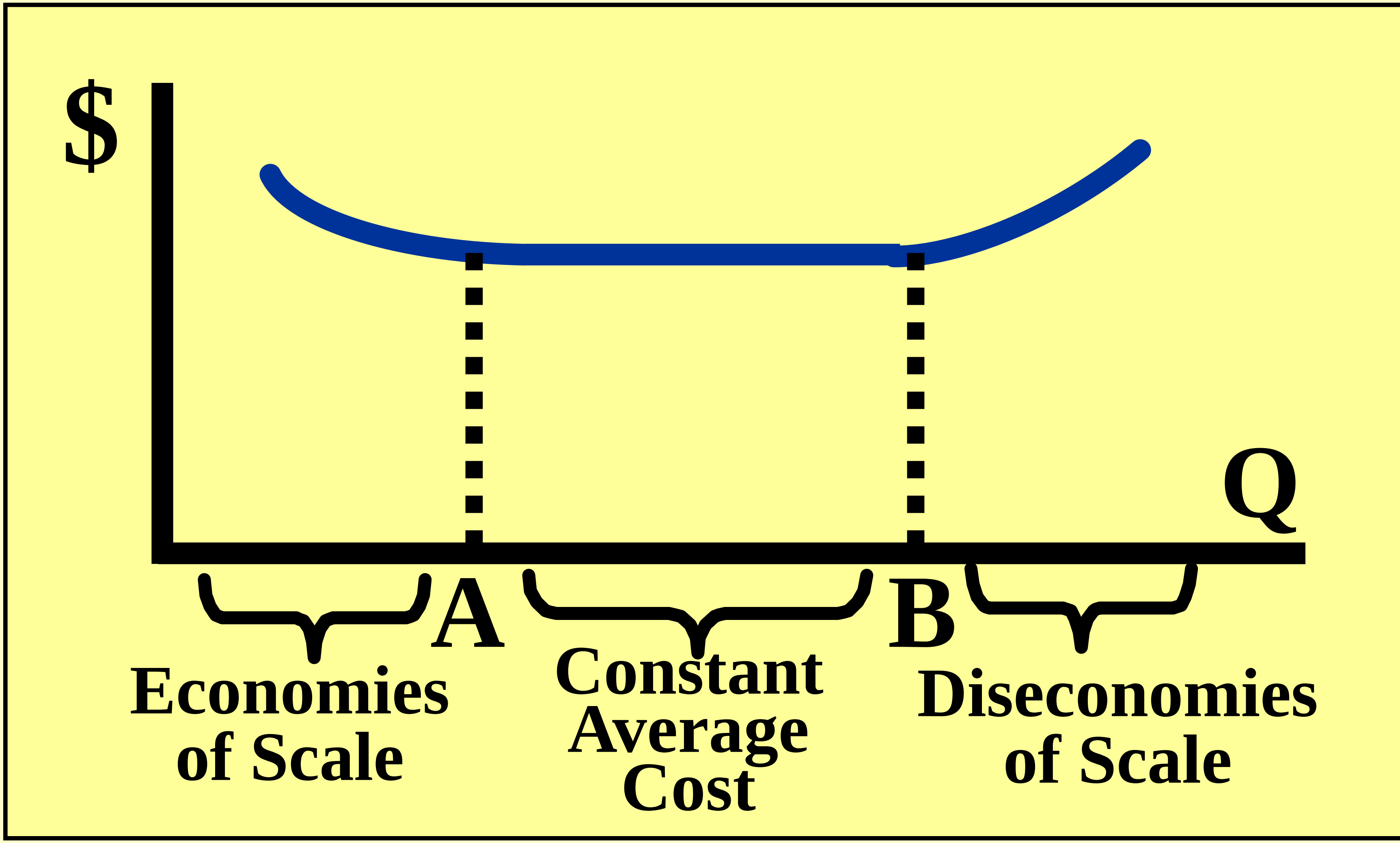


Exhibit 10

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