Theory of the Firm I:

Costs of Production

BECO 3310 - Fall 2025

Assumptions & Terms

- The goal of a firm is to maximize profit.
- Total Revenue
  - The amount a firm receives for the sale of its output.
- Total Cost
  - The market value of the inputs a firm uses in the production of output.
- Profit
  - Total Revenue – Total Cost

Moving Forward…

- The next few sections of class will examine the realm of cost.
  - Cost (until now) has been explained as opportunity cost and money cost.
  - We have not explained the relationship between both and how they impact profitability.
- Without economics, production is just a relationship between input and output; nothing more than an allocation paradigm.
  - Leaves out the economic notion of cost and substitutes in the monetary notion of cost.

Cost

- Cost is pervasive in human action.
  - We are constantly forced to make choices that sacrifice the benefits from an alternative course of action.
  - Money is a frequently used measure of cost, but it is not cost itself.
- We encounter costs even in the most mundane & trivial actions.
  - Doing nothing is costly!

Cost & the Firm

- The Firm is not a “black box.”
  - Economists are often accused of viewing the firm too simplistically.
- We must develop understanding of the firm’s cost structure.
- We must address the question of why firms even exist!

Costs

Total Revenue & Cost

- Total Revenue
  - Amount a firm receives for the sale of its output.
  - The quantity of the output a firm produces times the price at which it sells its output.
    - $TR = P * Q$
- Total Cost
  - Market value of the inputs a firm uses in production.
    - TC

What Are Costs?

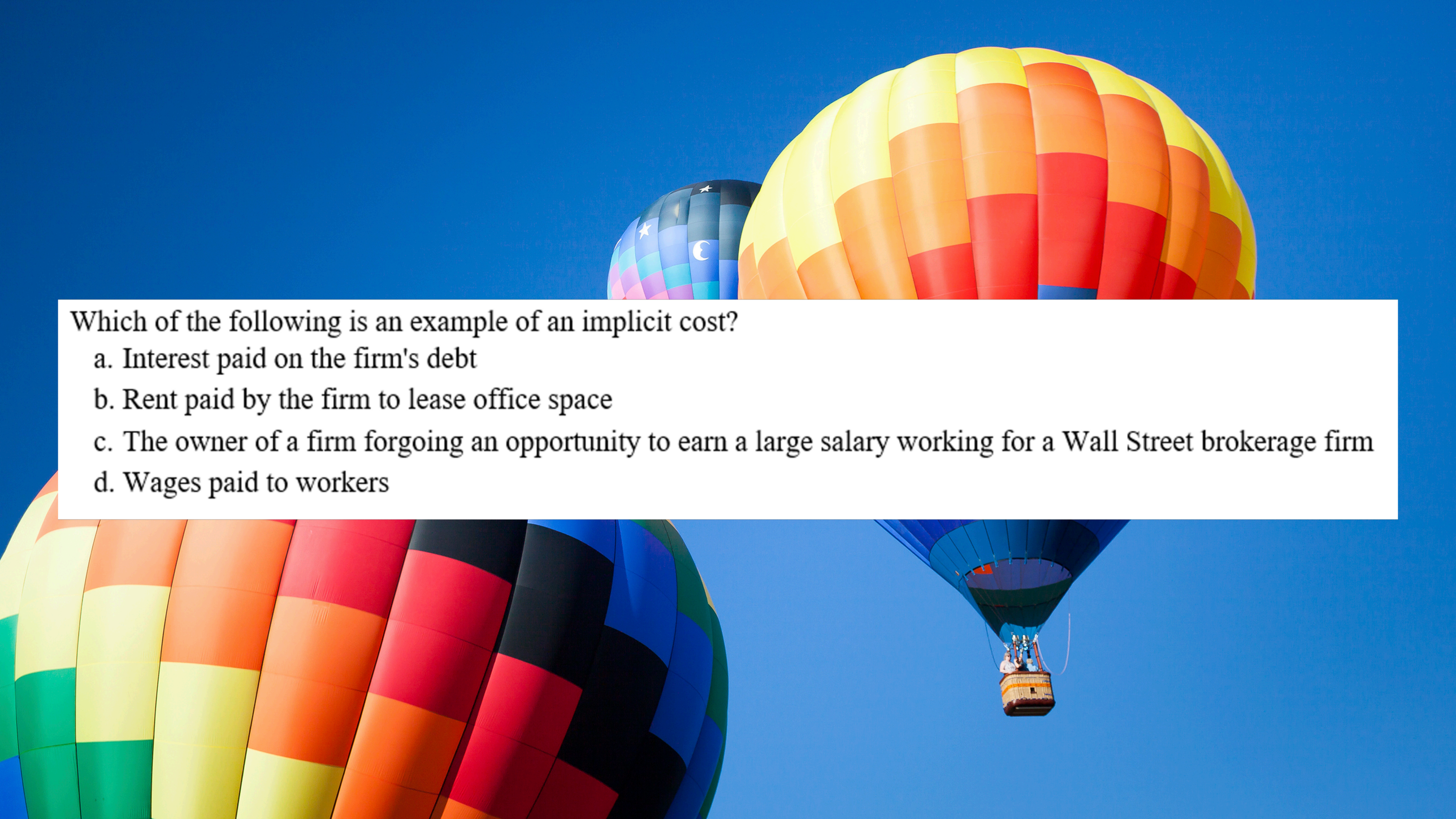
- Costs as opportunity costs.
  - The value of your next best alternative.
  - The cost of something is what you give up to get that something.
- The Firm’s Cost of Production
  - Includes all the opportunity costs of making its output of goods & services.
  - Explicit Costs
  - Implicit Costs

More on Costs?

- Explicit Costs
  - Input costs that require an outlay of money by the firm.
  - Has an exact dollar amount (“has a receipt”).
- Implicit Costs
  - Input costs that do not require an outlay of money by the firm.
  - Not easily assigned a monetary value.
  - Not taken into account when “doing the books.”

More on Costs?

- Total Costs
  - Explicit Costs plus Implicit Costs
    - TC=Explicit Costs+Implicit Costs



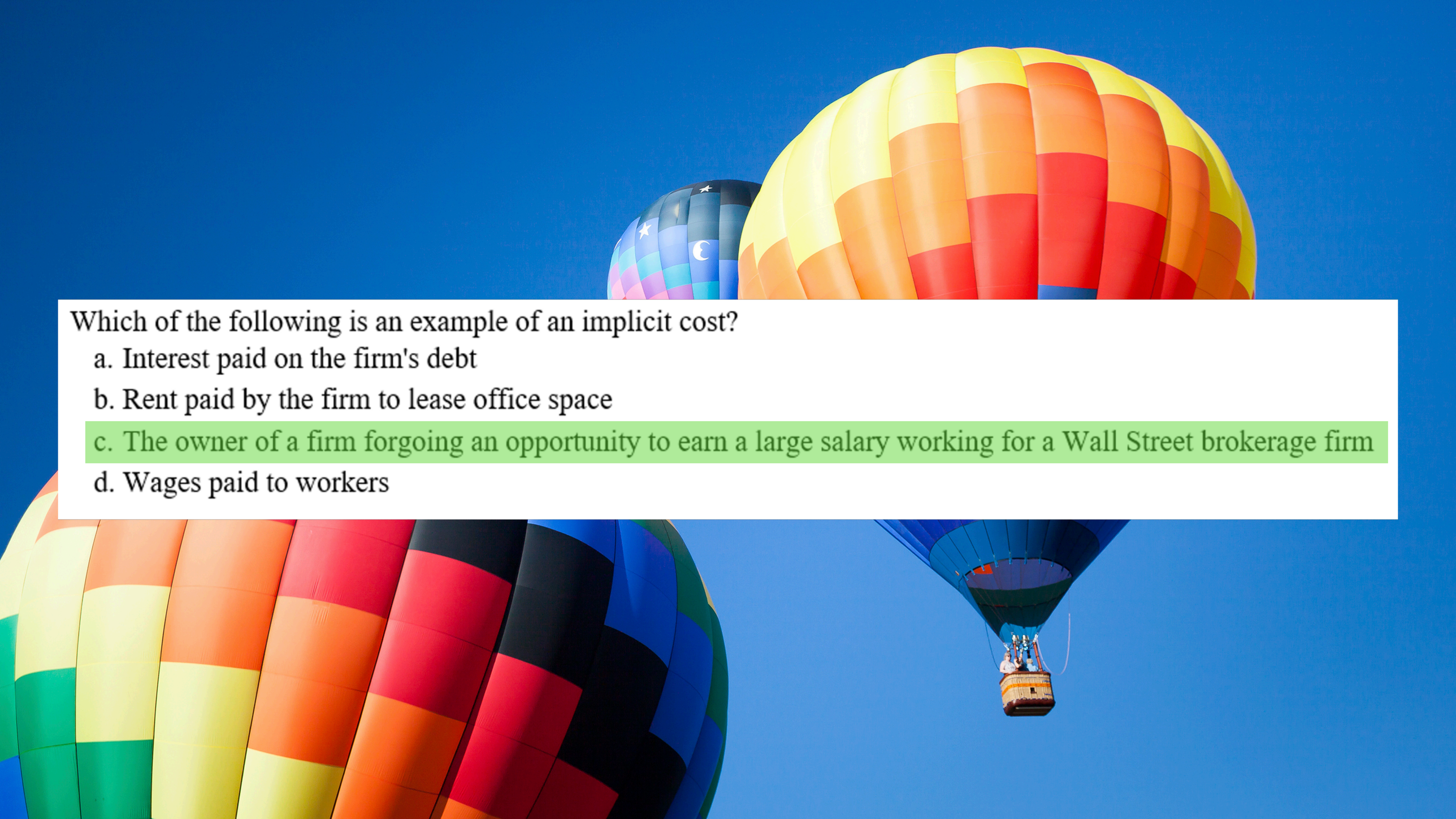
Which of the following is an example of an implicit cost?

a. Interest paid on the firm's debt

b. Rent paid by the firm to lease office space

c. The owner of a firm forgoing an opportunity to earn a large salary working for a Wall Street brokerage firm

d. Wages paid to workers



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Ex: Financial Capital

- The cost of financial capital as an opportunity cost:
  - Implicit cost, not shown by an accountant.
  - Interest income not earned on financial capital because it's owned as savings, invested in business.
- It's still an opportunity cost because it is what you are giving up by doing this action.
  - You could've invested money in the stock market instead of putting it into a new venture.

A Note on Sunk Costs

- A sunk cost is a **past cost**.
  - A cost that has already been incurred, meaning it **cannot be changed**.
  - Therefore, it's **irrelevant** to current decisions.
- Sunk costs are recognized on accounting statements but should be ignored in decision-making.
  - Why?
  - Profits are **forward-looking**. We make choices about how we expect an action to influence the future.


LOST IN OUR WORLD, FOUND IN ANOTHER
Disney
JOHN CARTER
IN DISNEY DIGITAL 3D


LOST IN OUR WORLD, FOUND IN ANOTHER
Disney
JOHN CARTER
IN DISNEY DIGITAL 3D


JOHNNY DEPP
ARMIE HAMMER
Disney
LONE RANGER
FSK ab 12 freigegeben
Vom Regisseur und Produzenten von
PIRATES OF THE CARIBBEAN
Disney DVD


LOST IN OUR WORLD, FOUND IN AN
Disney
JOHN CARTER
IN DISNEY DIGITAL 3D


GHOSTBUSTERS
ANSWER THE CALL


JOHNNY
DEPP
ARMIE
HAMMER
RANGER
Regisseur und Produzenten von
PIRATES OF THE CARIBBEAN
Disney
DVD

Why do we make bad movies?

- A lot of movies that get made lose money.
- Why do they go through with these failing projects?
- It may be better to lose some money than all money.

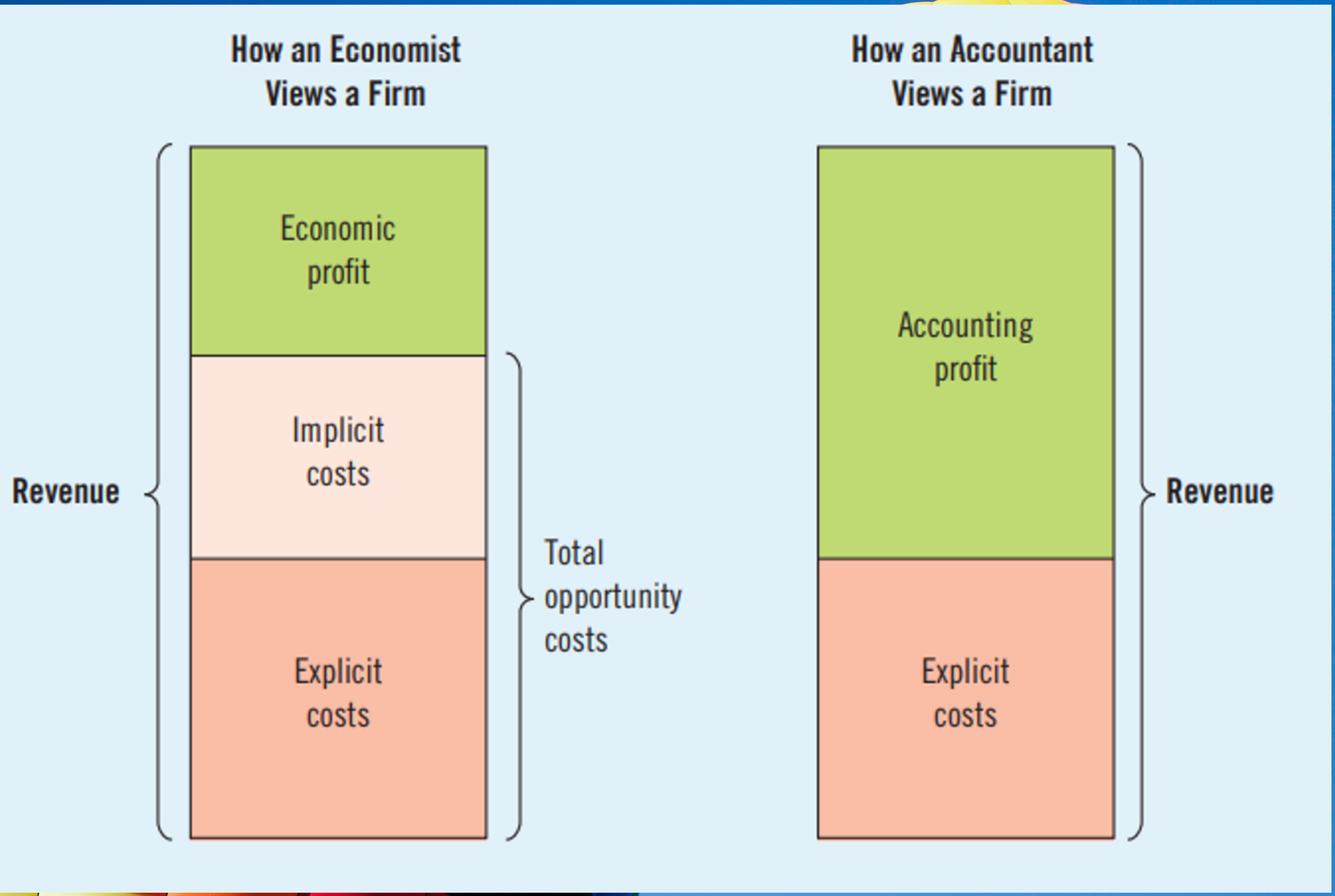
Profit

Economic vs. Accounting Profit

- **Economic Profit**
  - Total Revenue minus Total Cost
  - Total Costs includes both ***Explicit & Implicit*** costs.
  - Profit-maximizing firms look to maximize economic profit.
    - Economic Profit=TR -TC
    - Economic Profit=TR -(Explicit Costs+Implicit Costs)

Economic vs. Accounting Profit

- **Accounting Profit**
  - Total Revenue minus Total Explicit Costs
  - Larger than Economic Profit.
  - Used for financial performance.
  - Ignores the opportunity cost of alternative use of dollar amount.
    - Accounting Revenue=TR -Explicit Costs


How an Economist Views a Firm
Economic profit
Implicit costs
Explicit costs
Revenue
Total opportunity costs
How an Accountant Views a Firm
Accounting profit
Explicit costs
Revenue

Economic Profit in Practice

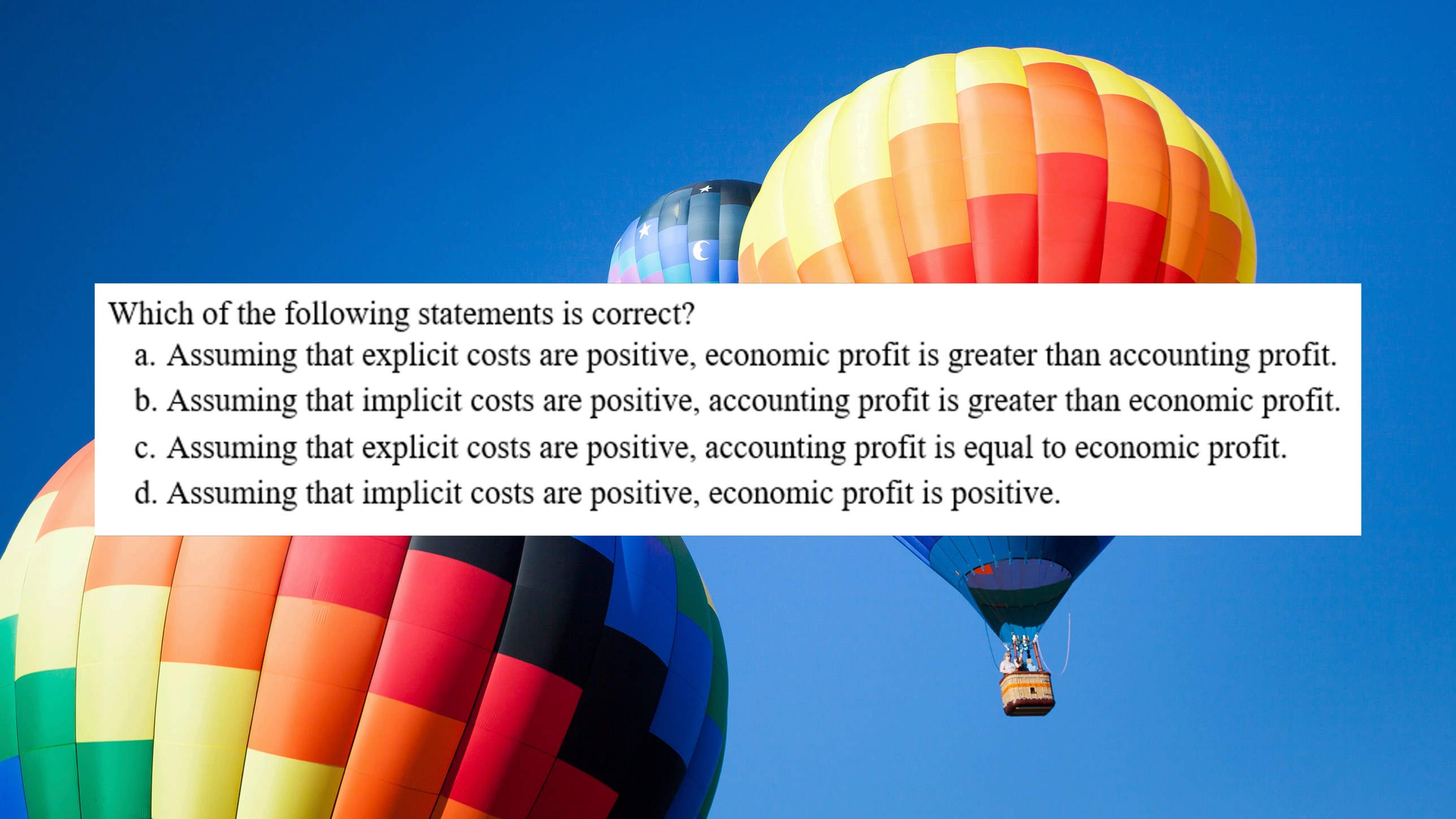
- It’s just learning to account for opportunity cost!
- We do this all the time and without even realizing it.
  - Ex: Applying for a job.
  - You see a salary (explicit cost), but you also account for other factors (location, friends/family, quality of life, etc.).

Normal Profit as a Cost

- Some costs of doing business are never reported on a company's accounting statements.
  - The opportunity cost of the firm's owner/manager (equal to the salary the owner/manager could have received elsewhere).
  - The opportunity cost of the capital (the earnings that could have been received had the firm's owner invested his finance in some risk-free investment, say, a government bond).
  - The risk cost of doing business (or the expected losses from failure).

Normal Profit as a Cost

- Although these costs are not reported on accounting statements, they must be recovered.
- It’s important to distinguish between **book profits** & **normal profits**.



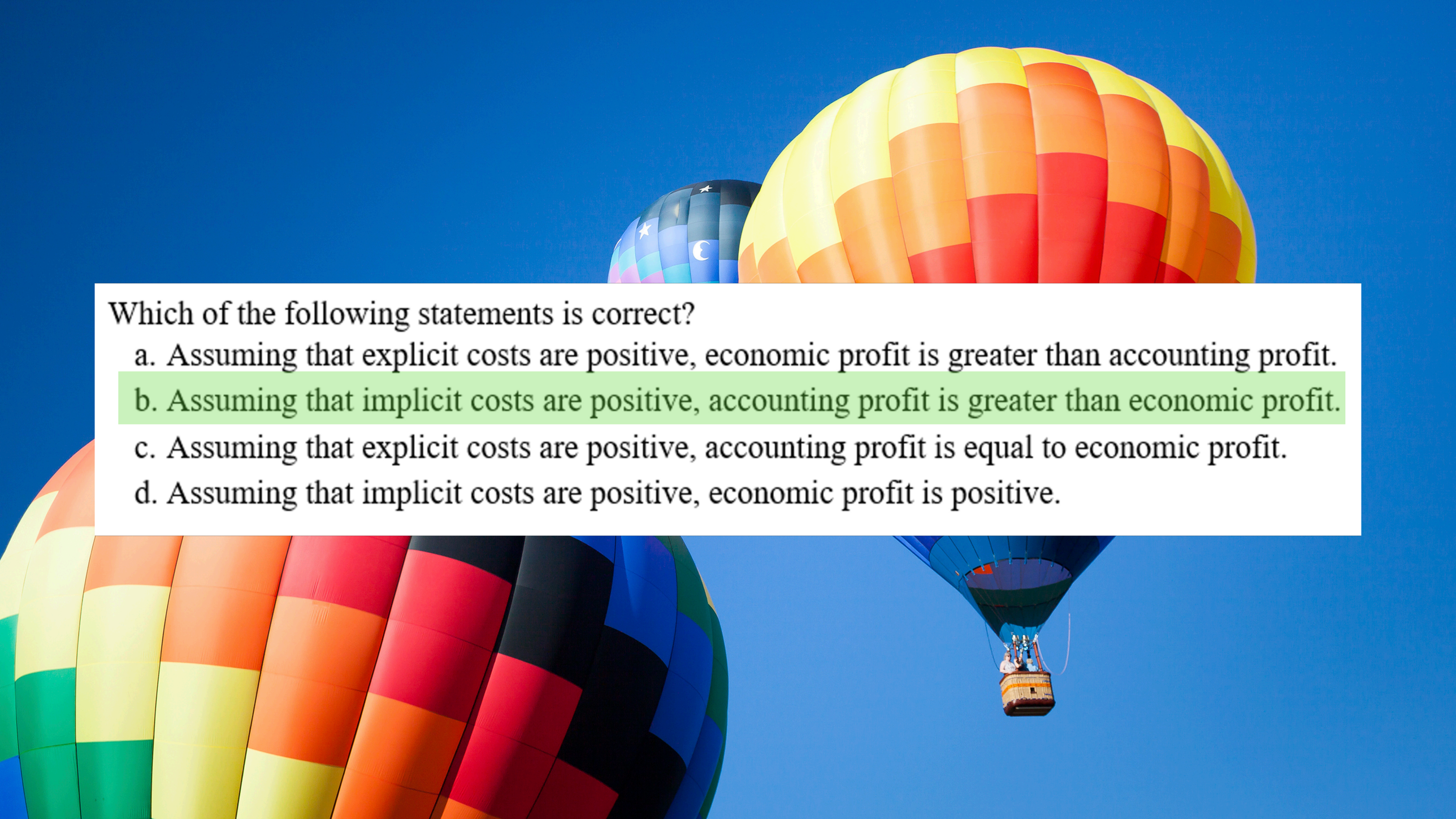
Which of the following statements is correct?

a. Assuming that explicit costs are positive, economic profit is greater than accounting profit.

b. Assuming that implicit costs are positive, accounting profit is greater than economic profit.

c. Assuming that explicit costs are positive, accounting profit is equal to economic profit.

d. Assuming that implicit costs are positive, economic profit is positive.



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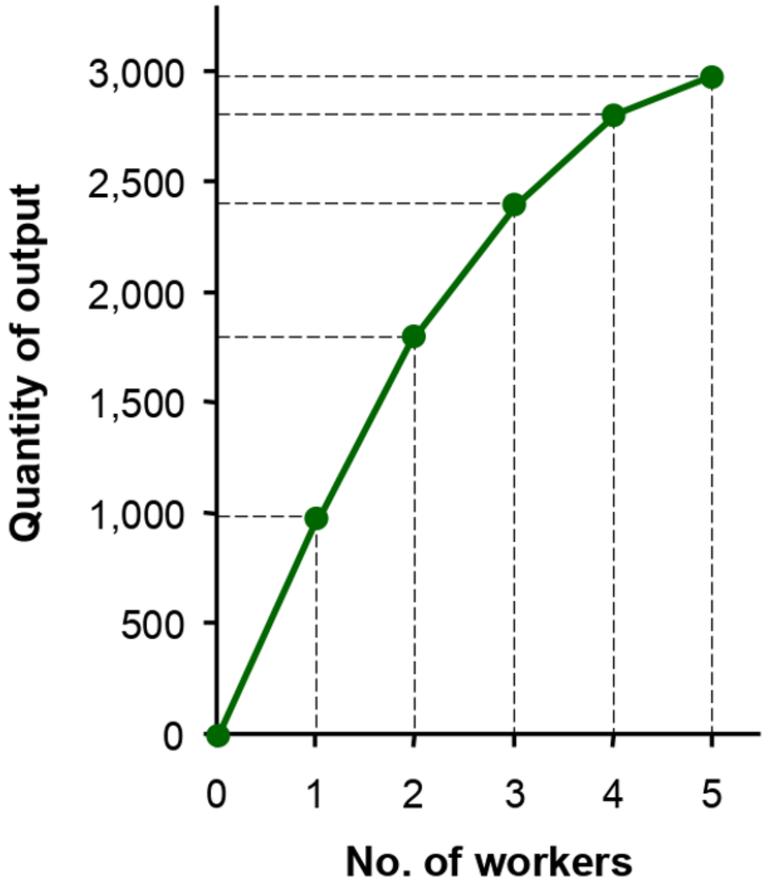
The production function

The Production Function

- Shows the relationship between the quantity of inputs used to make a good and the quantity of output of that good.
  - Examples of input: land, labor, capital.
  - Examples of output: bread, clothes, toys.
- The production function gets flatter as production rises.

EXAMPLE 1: Farmer Jack's Production Function

L (no. of workers)	***Q*** (bushels of wheat)
0	0
1	1000
2	1800
3	2400
4	2800
5	3000



Marginal product

- The **increase in output** that arises from **an additional unit of input**.
- How many units of output come from an increase in **one unit of input**.
- The **slope** of the production function.

Marginal product

$$MP = \frac{Change\ in\ Total\ Product}{Change\ in\ Input}$$

$$MP = \frac{Change\ in\ Output}{Change\ in\ Input}$$

$$MP = \frac{\Delta Output}{\Delta Input}$$

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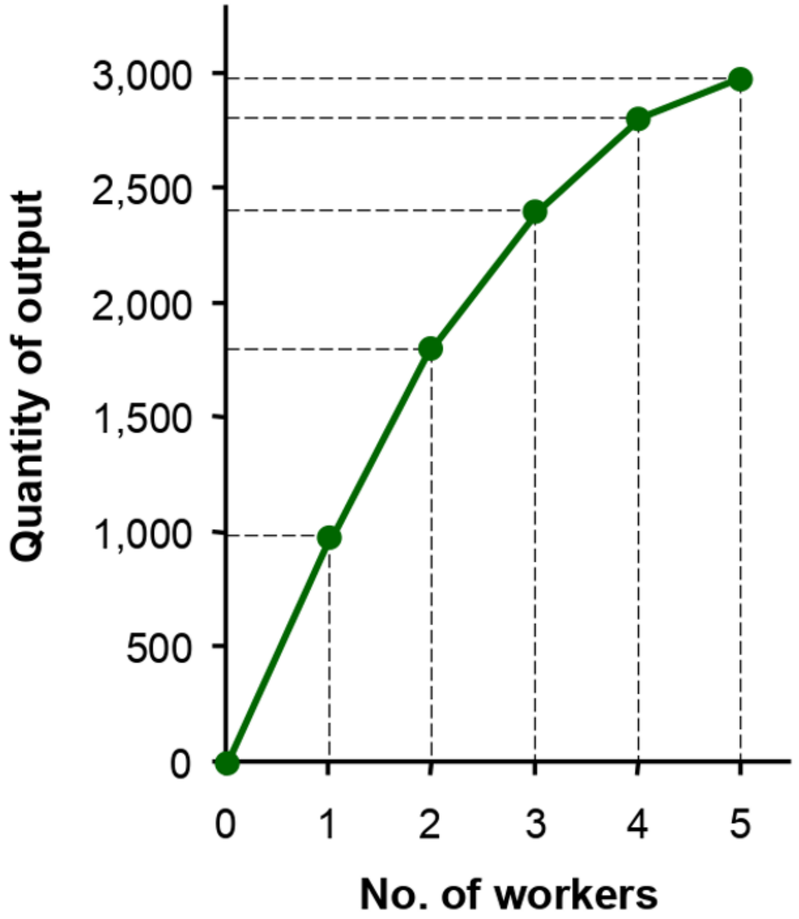

Ex: Chloe’s Cookie Factory

- The quantity of cookies produced per hour at Chole’s factory depends on the number of workers.
- Pay attention to what happens to the marginal product of labor.

(1) Number of Workers	(2) Output (quantity of cookies produced per hour)	(3) Marginal Product of Labor	(4) Cost of Factory	(5) Cost of Workers	(6) Total Cost of Inputs (cost of factory + cost of workers)
0	0		$30	$0	$30
		50			
1	50		30	10	40
		40			
2	90		30	20	50
		30			
3	120		30	30	60
		20			
4	140		30	40	70
		10			
5	150		30	50	80
		5			
6	155		30	60	90

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		20			
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		10			
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		5			
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Diminishing Marginal Product

- The marginal product of an input declines as the quantity of the input increases.
- This is why the production function gets flatter!
  - The slope of the production function is decreasing.
- Firms stop producing once the outputs are not increasing with increased inputs.

Diminishing Marginal Product

- “Two heads are better than one.”
  - In a firm, one person is usually not enough (because they have to do everything).
  - More workers, can specialize in particular tasks.
- Ex: Sandwich Shop
  - Just one employee would need to make sandwiches, clean, do the accounting, pay the bills.
  - Three employees can specialize!
  - BUT, eventually the shop gets TOO crowded.

Labor (workers)	Total Product (sandwiches)	Marginal Product (sandwiches)
0	0	0
1	10	10
2	22	12
3	37	15
4	47	10
5	53	6
6	55	2
7	53	−2

Labor (workers)	Total Product (sandwiches)	Marginal Product (sandwiches)
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1	10	10
2	22	12
3	37	15
4	47	10
5	53	6
6	55	2
7	53	−2

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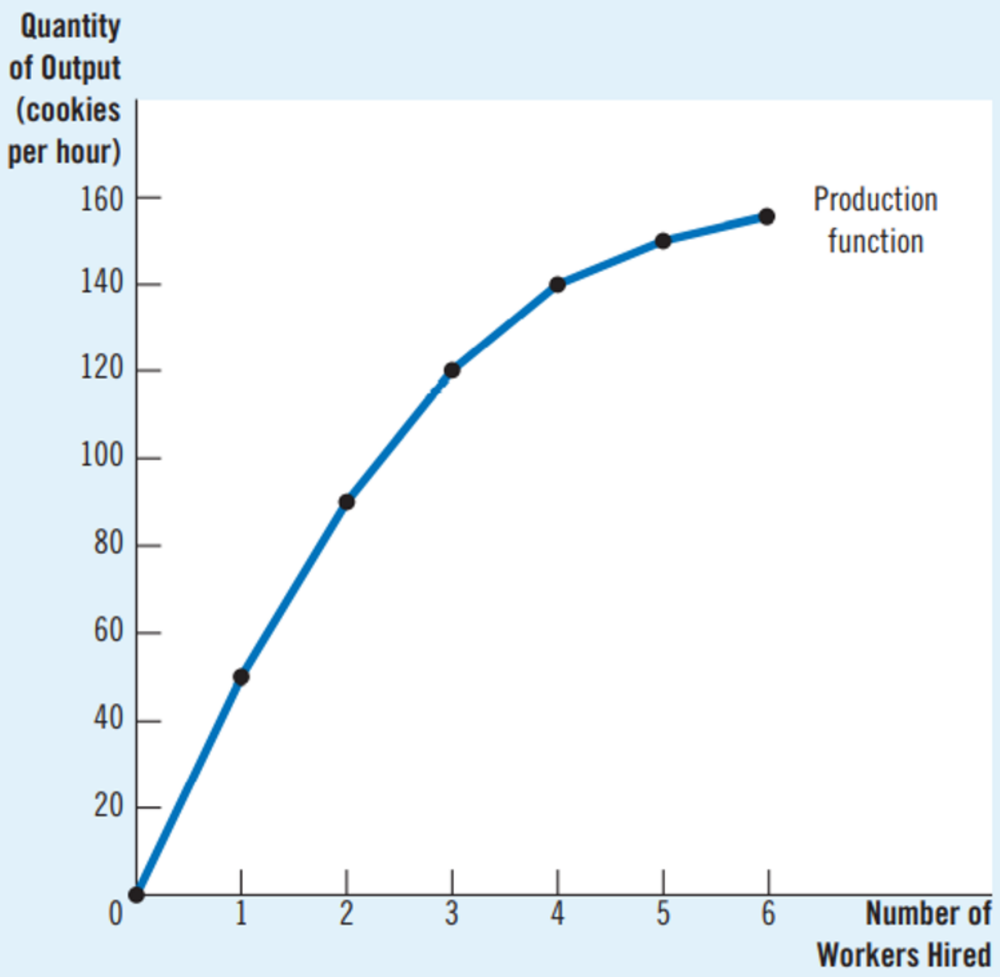
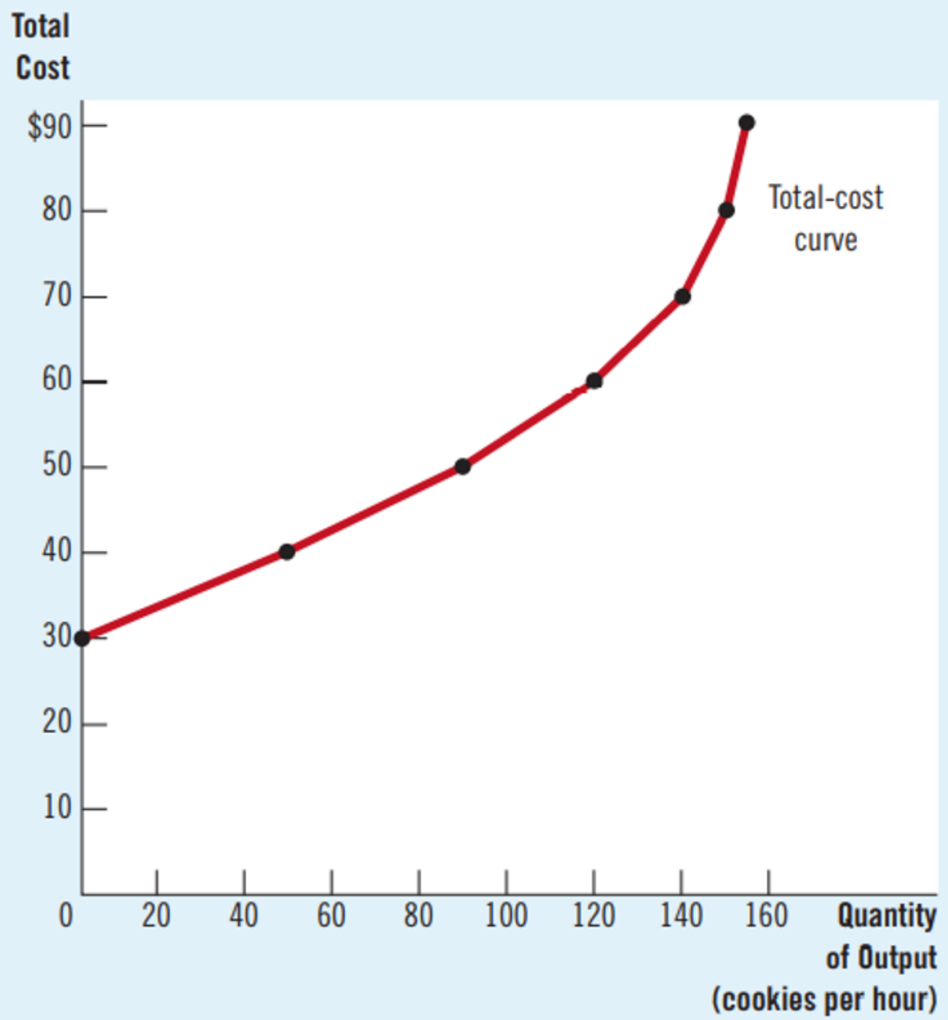

(a) Production function
Quantity of Output (cookies per hour)
160
140
120
100
80
60
40
20
0
1
2
3
4
5
6
Number of Workers Hired
Production function


(b) Total-cost curve
Total Cost
$90
80
70
60
50
40
30
20
10
0
20
40
60
80
100
120
140
160
Quantity of Output (cookies per hour)
Total-cost curve

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Labor (Number of workers)	Output (Units)	Marginal Product (Units)
0	0	–
1	300	300
2	500	200
3	600	100
4	650	50

What is the marginal product of the first worker?

a. 300 units

b. 200 units

c. 100 units

d. 50 units

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So what?

Why Do Firms Exist?

- Ronald Coase, “The Nature of the Firm”
- If production can be done without centralized planning, & with only the forces of the market, why do firms exist?
- Think about costs!

Why Do Firms Exist?

- Transaction Costs!
  - Tradeoffs are everywhere! No such thing as a free lunch.
  - Exchanges, production, transactions are costly.
  - There are even costs to using the market!
  - Some costs are too costly to undertake alone (search & information, bargaining).
- This is why firms exist, according to Coase.

Why Are Firms Limited?

- Firms don’t grow infinitely in size.
  - What keeps firms from growing forever?
- Overhead Costs
  - The costs of operating within a firm setting.
  - Producing many goods costs a hefty amount of fixed costs (think of automobile manufacturing).
  - Eventually, diminishing marginal product kicks in!

Firms Exists as a Way to…

- Minimize these transaction and overhead costs.
- But firms don’t grow forever. Diminishing returns set in.
- Firms increase in size to specialize production.
- Firms tend to be larger when:
  - The costs of organizing is small (or the rate these costs increase is slow).
  - When the supply price of the factors of production are low.

Thanks for your attention.
End of class.