What an Extra Worker Is Worth

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HOW TO READ THE CHARTS

- **Blue**: what a crew member adds
- **Orange**: the wage
- **Teal**: what the owner keeps
- **Gray**: fewer fish

Firms Hire Workers for What They Help Make

Derived demand

A restaurant hires cooks because diners value the meals they help make. The demand for work is *derived* from the demand for what the work helps make.

So what a worker is worth to a firm is a market value, not a fixed personal trait and not a person's worth as a human being. A skilled mechanic with good tools adds more than the same mechanic with poor ones.

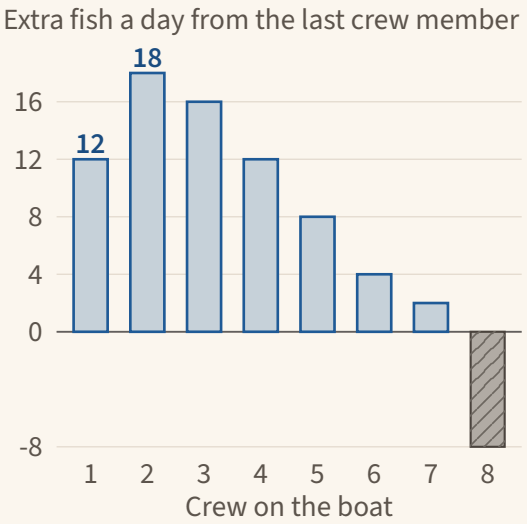
Suppose: an island and a boat

On an island, other jobs pay **$80 a day**. Someone gets a fishing boat with room for a few crew. Any crew member can do any job aboard.

The boat is one of many selling into a large fish market at **$10 a fish**. Its own catch is too small to move that price.

We track only fish sales and crew wages. How many crew should the owner take on?

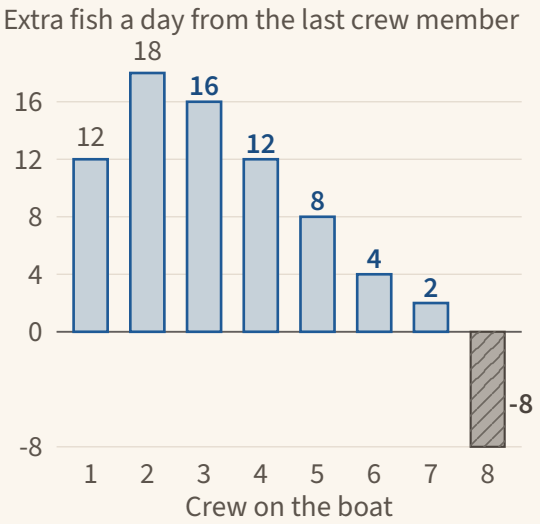
The Second Crew Member Adds the Most Fish



Crew	Total catch	Extra fish
1	12	12
2	30	18
3	46	16
4	58	12
5	66	8
6	70	4
7	72	2
8	64	-8

With the same boat, the extra fish from one more crew member is the *marginal product*. The second adds 18, more than the first: two can work the boat better than one.

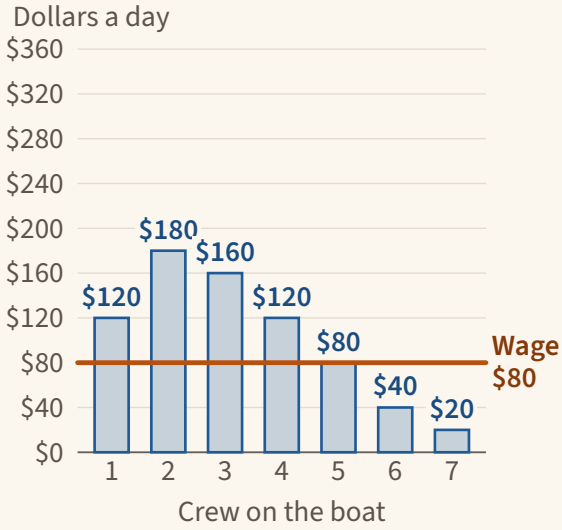
After the Second, Each Crew Member Adds Less



Crew	Total catch	Extra fish
1	12	12
2	30	18
3	46	16
4	58	12
5	66	8
6	70	4
7	72	2
8	64	-8

From the third on, each adds less: *diminishing marginal returns*. The total still rises through 7 crew; only the eighth cuts it. No owner stops at one or takes on an eighth.

At $10 a Fish, Each Crew Member Adds Dollars

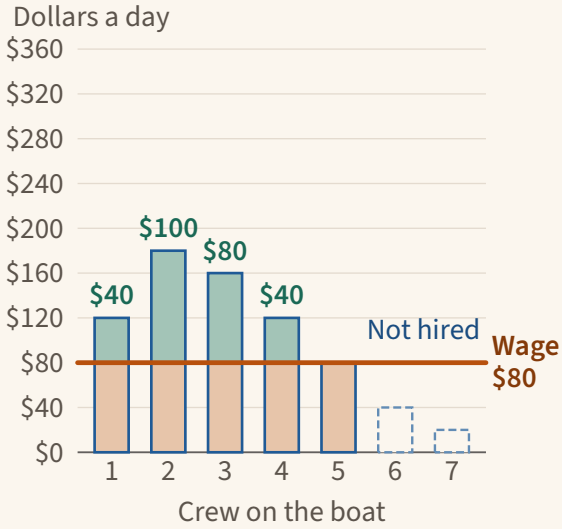


Multiply each crew member's extra fish by the $10 price: the **value of marginal product**. The second crew member adds 18 × $10 = $180.

To get a crew member, the owner must pay what other island jobs pay: **$80 a day**.

Which crew members are worth $80?

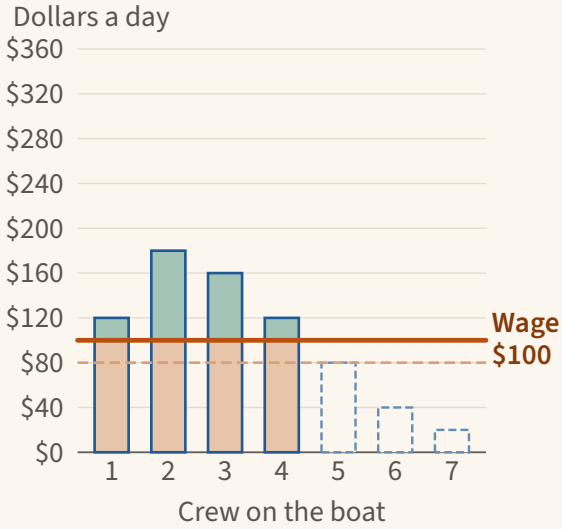
The Owner Takes On Five Crew at $80 a Day



Past the rising stretch, take on each crew member who adds at least the wage, as long as the whole crew's catch covers its wages. A sixth would add $40 and cost $80. The fifth adds exactly $80; we count the fifth in.

The catch is worth 66 × $10 = $660; **wages** are 5 × $80 = $400. **The owner keeps $40 + $100 + $80 + $40 = $260 a day.**

A Higher Wage Means a Smaller Crew

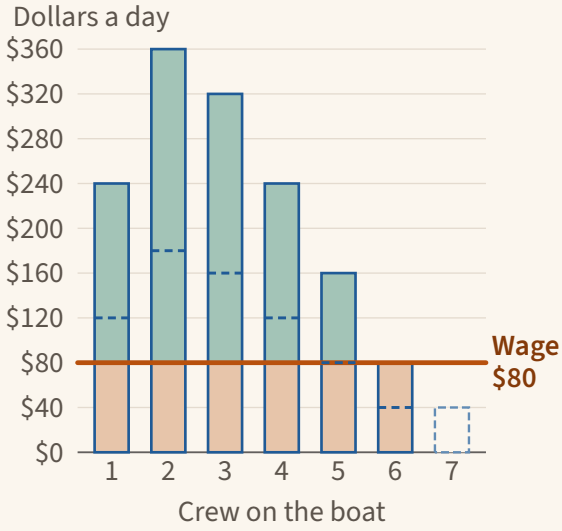


At a **$100** wage the owner takes on four: the fifth would add only $80. The owner keeps $58 \times \$10 - 4 \times \$100 =$ **$180 a day**.

Wage a day	Crew
$140	3
$100	4
$60	5
$30	6

From crew 3 on, the bars are the boat's demand for crew; a higher wage moves along it. Dashed: the old $80 wage.

A Higher Fish Price Raises the Demand for Crew



Suppose more people want fish, and its market price rises to **$20**. Other jobs still pay $80. Each crew member's extra fish is worth twice as much (dashes: at $10).

The owner now takes on **six**; the sixth adds $4 \times \$20 = \$80$, and we count the sixth in. The owner keeps $70 \times \$20 - 6 \times \$80 =$ **$920 a day**.

The whole demand for crew shifted up, because the fish became worth more.

Teamwork Blurs Who Produced What

Two crew members

Alone, either catches 12 fish; together, 30. (The table's 12 and 18 come only from the order we counted them.)

Take away either one, and the catch falls by 18, so each "added" 18. But 18 + 18 = 36, more than 30. Both comparisons are right, and both cannot be paid.

Five crew members

Take any one of five away, and the catch falls by 8 fish, or $80. Five times $80 is $400, but the catch is worth $660.

Two crew: the "added" amounts sum to more than the catch. Five: to less. The owner, who supplies the boat, keeps what is left after wages.

Competition pushes each person's pay toward what one more such worker adds. It does not measure what each person "really" produced: in a team, there is no single answer.

A Winch Replaces Some Tasks and Helps Others

Suppose every boat gets a winch

A higher wage does more than shrink the crew. Over time it makes labor-saving gear worth buying.

Separately, a new powered winch lets each boat land the same catch with fewer deckhands. It also creates work: building, fixing, and running winches, and handling the extra fish.

Do fishing jobs rise or fall?

One boat cannot move the fish price. But with a winch on every boat, a fish costs less to catch, the fleet catches more, and the market price falls.

Crew jobs = boats $\times$ crew per boat. They rise only if the number of boats grows enough to make up for the smaller crews. The more buyers respond to cheaper fish, the likelier that is.

The Amount of Work Worth Doing Is Not Fixed

The lump-of-labor mistake

A common view: there is a fixed amount of work, so every task a machine takes over is a job gone for good.

But a task becomes a job whenever someone expects it to be worth what it costs. Wants are never used up, so people and tools move on to other work, including building and fixing the new machines.

What is true, and what is not

True: the change can hurt the people whose skills, homes, or towns are tied to the old work, and moving to new work can be slow.

Not true: that a task that disappears means one fewer job forever. How many jobs there are afterward is a question about the evidence, not a fixed number.

AI Changes Which Work Is Worth Doing

The worry

AI can write, code, and answer questions, so many fear it will take everyone's job.

If that fear assumes a fixed list of tasks, it is the lump-of-labor mistake from the last page.

In the early 1800s, most American workers farmed. Machines now do most farm work, yet most adults still have jobs.

Ask what we asked of the winch

1. **Replace.** Which tasks can AI do more cheaply? Those workers can lose out, and moving on can be slow.
2. **Help.** Whom does it make more productive? A worker who adds more is worth more.
3. **Cheaper goods.** Buyers spend what they save, and new work can follow.

How AI will change jobs and pay is a question for the evidence. The mistake is to answer it in advance by assuming the amount of work is fixed.

Pay Differs Because Work, Skills, and Jobs Differ

Why might a boat captain earn more than a deckhand? Look at both columns.

What employers will pay

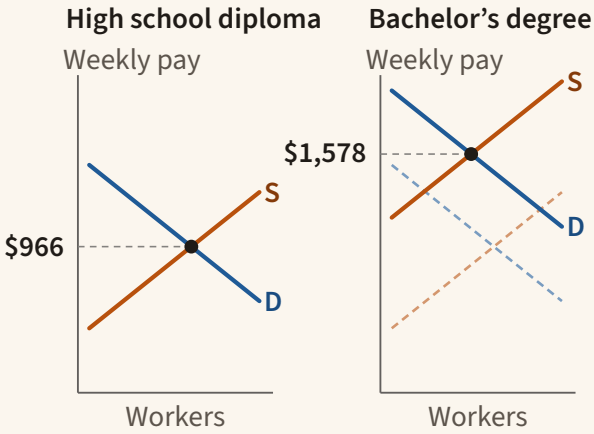
What one more such worker adds, valued at the price of what is made. Skill, effort, tools, and the demand for the product all matter.

Who can and will do the work

The cost of getting the skill, including the pay given up while training. How pleasant, safe, or steady the job is. Barriers such as licenses, discrimination, or limits on who may enter.

A money wage is not a full measure of a job, nor a verdict on anyone’s merit.

Skills That Are Costly to Get Earn More



2025 medians, full-time workers 25 or older: $1,578 a week with a bachelor's degree, $966 with only a high school diploma.

Demand is higher: these skills add more. **Supply** is smaller: college costs tuition and lost pay. Part of the gap is who goes, not only what college teaches.

At these wages no one gains by switching: for the worker on the fence, the extra pay over a career just covers its cost. A cheaper degree would shrink the gap.

Your Skills Are Wealth You Carry With You

Human capital

Skills from school, training, and experience are *human capital*. Like a machine, they take resources to build and pay off for years.

Unlike a machine, they cannot be taken from you and handed to someone else. You take them wherever you go.

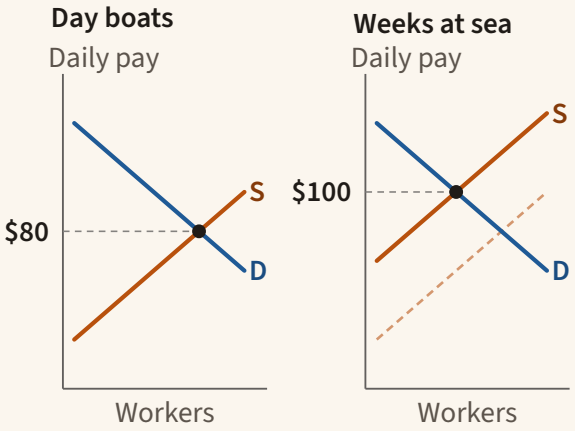
But not beyond reach

Skills can wear out: illness, time away, or new technology.

Rules can block their return: licenses, discrimination, limits on where you may work.

And a lender cannot repossess your skills, so school can be harder to borrow for than a truck, which a lender can take back and sell.

Harder Jobs Must Pay More to Fill



Suppose deckhands can work on day boats, home each night, or on boats out for weeks. Both add the same fish, so **demand** is the same.

Fewer will spend weeks away at any wage, so **supply** is smaller (dashes: day boats).

Day boats pay $80 a day; weeks at sea, $100. The $20 is a *compensating differential*. At these wages no deckhand gains by switching: the wage gap sorts workers between the jobs.