

Behavior of firms under different rules of ownership

Example Oyster Harvesting

Given:

- The total output of the fixed sized oyster bed given variable labor input
- the market price of oysters is \$1 per lb
- all farmers can earn \$5 per day in their next best alternative.
- All workers are identical

We have three (simplified) versions of property rights: Common Property, Private Property and Socialist Coop. After filling in the table below, state the total output from the oyster bed, and the amount of workers harvesting under each form of property rights. Which version is economically efficient? Explain how the other two forms of “ownership” are not efficient.

L	TP	VTP=TP*P	VMP	VAP	TLC	Rent
1	8	\$8				
2	17	17				
3	25	25				
4	32	32				
5	38	38				
6	43	43				
7	44	44				
8	45	45				
9	45	45				
10	45	45				
11	45	45				

IT IS HIGHLY RECOMMENDED THAT YOU ATTEMPT TO SOLVE THIS PROBLEM PRIOR TO REFERENCING THE SOLUTION BELOW. ALSO MAKE SURE TO COPY THE ENTIRE PROBLEM AND ANSWER SOMEWHERE IN YOUR NOTES. DO NOT JUST READ!!!

Solution

L	TP	VTP=TP*P	VMP	VAP	TLC= L*W	Rent= VTP- TLC	Wage	5
1	8	\$8	\$8	\$8	\$5	\$3	mkt price	1
2	17	17	9	8.5	10	7		
3	25	25	8	8.33	15	10		
4	32	32	7	8	20	12		
5	38	38	6	7.6	25	13		
6	43	43	5	7.167	30	13		
7	44	44	1	6.286	35	9		
8	45	45	1	5.625	40	5		
9	45	45	0	5	45	0		
10	45	45	0	4.5	50	-5		
11	45	45	0	4.091	55	-10		

These three (simplified) versions of property rights lead to different productions of oysters due to the different “rules” they follow.

privately owned firm

- engaging in profit maximization: profit = market price * f(L,K) – w*L
- competitive markets (for labor and for output)
 - ⇒ firm is a price taker.
- employs factors of production as long as the value of the marginal product is greater or equal to the additional cost to the firm.

$$MP \cdot p = w$$
 (for those with calculus experience: this can be calculated if you take the partial derivative of profit with respect to the factor input: labor)
- If $VMP < w$, then the firm will not hire that unit of input, the increase of total product is valued less than the amount paid to the marginal worker.

Common property

Examples: ocean fishing, countries with un-enforced property rights

- No person owns the land
- Anyone can join
- Each worker shares equally in the total output
- With no ownership, workers join until the average product falls to the wage as they are paid by the amount they bring to the market
 - $VTP / L = VAP = w$

Socialist Coop

- The farmers own the land
- The coop limits the number of farmers who join
- Each worker shares equally in the total output, so again their wage is what they bring to the market
- With the limits, farmers join until VAP is maximized.

Before we answer this question we need to look closer at the **wage** for these oyster farmers.

If a worker declines the \$5/day wage, it means that there must be another alternative that pays them equal or more. Or if they do accept, they are forgoing this other job.

→ wage = opportunity cost of labor

When an individual becomes a farmer, this means that \$5 worth of other goods are not produced in another sector for society. Say this laborer could have worked in a textile factory, thus the opportunity cost of becoming an oyster harvester is \$5 of clothing.

Also recall the difference between marginal product and average product

How much more is the value of total output going to increase when we add one more laborer? (MP)

How much output is each of the current workers contributing to the value of total output? (AP)

Examine the Socialist Coop:

Max VAP

Two people will join the coop and produce 17 lbs of oysters worth \$17 for society, they sell the oysters and split the profits, each farmer will get a wage of \$8.50
efficient?

⇒ no, allowing the 3rd harvester will add \$8 worth of oysters to society with a loss of \$5 output in another sector. We could improve.

Examine Common Property:

VAP = w

Nobody restricts entry to the tidal flats, thus nine people harvest on the land \$45 worth of oysters are produced for society. They bring their goods to the market, and sell for \$1 lb, each person receives \$5.

9th worker, receives \$5 as wage, but contributes \$0 in additional output for society, they could have worked in another industry (clamming, textiles) received \$5, and contributed \$5 to society.

Same with 8th and 7th workers, each contribute an additional \$1 to society while receiving a wage of \$5.

\$45 worth of oysters are produced, but also at a cost of \$45. No gains have occurred, the rents were dissipated.

The marginal product takes into account the impact of adding another worker on the previous workers average productivity. By ignoring this, (by just looking at the average product) the workers impose a negative external cost on the other workers due to the law of DMP

Examine Private Ownership:

VMP = wage

The owner of the land hires workers for \$5/day. The owner hires 6 workers, \$43 worth of oysters are harvested, at a cost of \$30 = 6 * 5. As a consequence the rents are maximized. Rent = \$13

All the harvesters produce at a margin \geq market price.

The owner can observe the entire costs of their actions. Observes an additional worker only contributing \$1 towards total output: will not hire. The landowner owns all the damages and benefits that the workers have on each other. Resources do not get misallocated. All gains from trade are exhausted. With well defined property rights and competitive markets the allocation of resources is pareto efficient.

Also note that rent is maximized at $L = 5$, why isn't that efficient? Recall with pareto optimality, at this point, we cannot make anyone better off without making someone else worse off. The 5th laborer is receiving \$5 for a wage, so s/he is happy, the owner is getting max rent of \$13 so the owner is happy, but society can benefit, by the extra 5 units of possible output if a 6th worker is hired. Hiring the 6th worker is pareto superior to stopping at the 5th worker, it also turns out that the 6th worker is the pareto optimal point.