

# Pareto Efficiency

## Definition of efficiency:

An outcome is **Pareto efficient** when it is **not** possible to make anyone better off without making someone else worse off.

## Definition of inefficiency:

Like usual sense of inefficient: haven't done the best we can

An outcome is **inefficient** when someone **can** be made better off **without** making anyone worse off.

Possible to rearrange the outcome to:  
*help someone without hurting anyone.*

"Money left on the ground"

## Policy implication:

Want to **detect** and **fix** *inefficient* outcomes

Known as "*Pareto improvements*":

Actions that make at least one person better off without hurting anyone

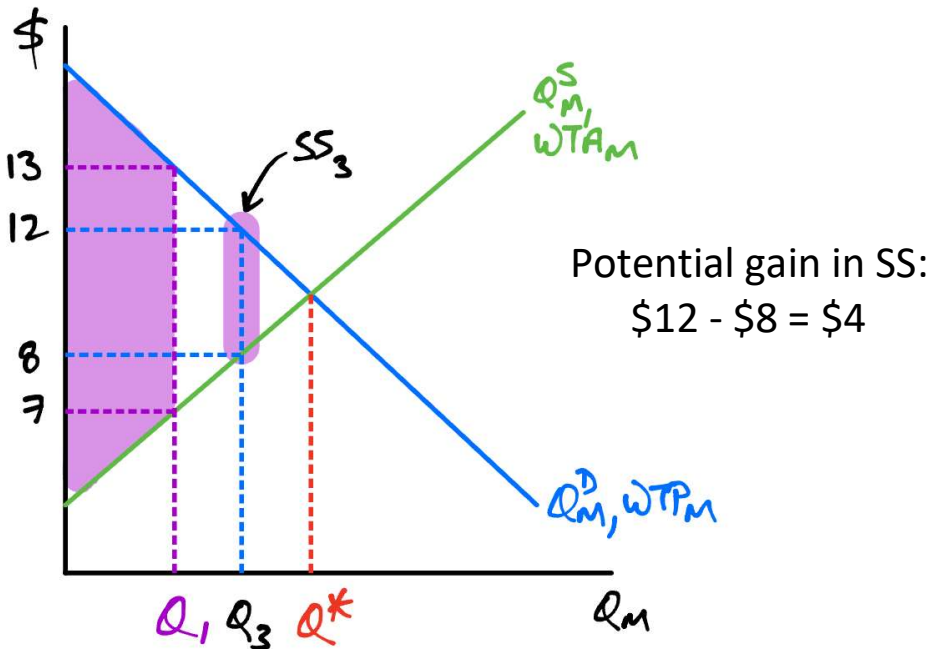
Market  $Q^*$  is efficient; other  $Q$ s are inefficient

Case 1:

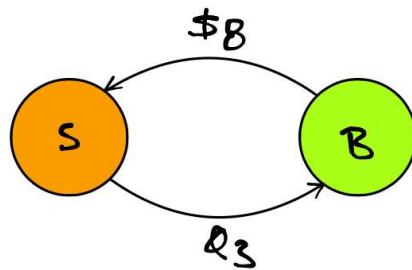
If  $Q_1 < Q^*$  a Pareto improvement is possible by increasing  $Q$

Example:

Suppose WTP and WTA have the values below



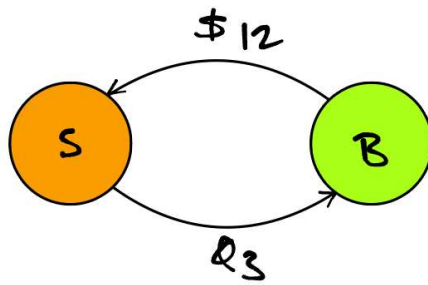
Possible Pareto improvement 1:



$P = \$8$	$WTP = \$12$
$WTA = \$8$	$P = \$8$
$PS = \$0$	$CS = \$4$

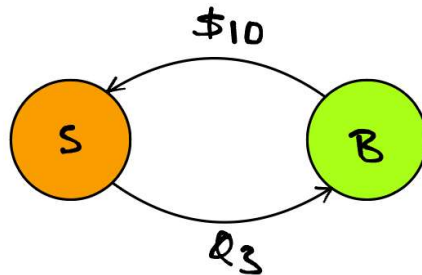
Possible Pareto improvement 2:

$\$12$



$P = \$12$	$WTP = \$12$
$WTA = \$8$	$P = \$12$
$PS = \$4$	$CS = \$0$

Possible Pareto improvement 3:



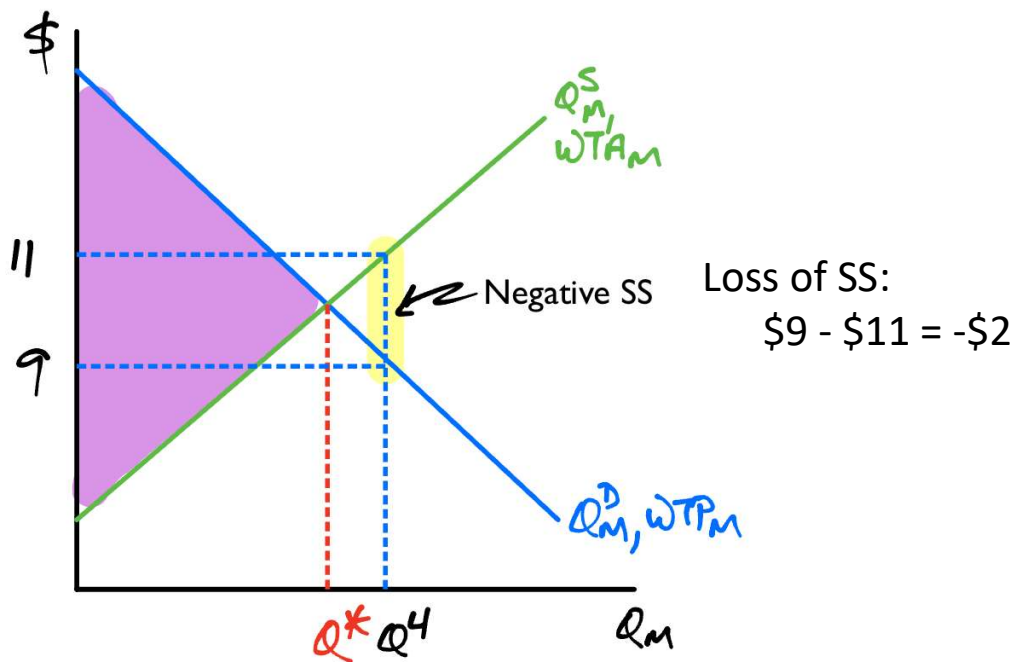
$P = \$10$	$WTP = \$12$
$WTA = \$8$	$P = \$10$
$PS = \$2$	$CS = \$2$

Many possible improvements:

- All produce a gain of \$4
- Stopping at  $Q_1$  is not efficient.

Case 2:

If  $Q_2 > Q^*$  a Pareto improvement is possible by decreasing  $Q$



Possible Pareto improvement:

1. Cancel  $Q_4$
2. Seller gives buyer  $\$9$  instead

$$\text{Seller gain: } \$11 - \$9 = \$2$$

$$\text{Buyer gain: } \$9 - \$9 = \$0$$

Inefficiency and deadweight loss:

- If there is **DWL**, the outcome is **inefficient**
- Could make someone better off