Externalities, part 1

Third intervention will be **subsidies**:

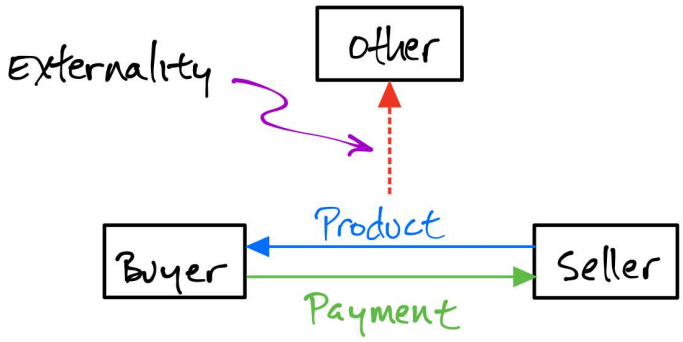
Policies to encourage an activity and **raise** Q

Usual rationale:

Activity creates a *positive externality*

Externality:

An unintended cost or benefit created for a third party (3) as a result of a transaction between a buyer (B) and a seller (S):



Two types:

1. Cost or *negative* externality

   Examples: pollution, noise, blighted property

   Economics: traders *don't pay the full cost* of their actions

2. Benefit or *positive* externality

   Examples: vaccinations, learning effects, landscaping

   Economics: traders *don't receive the full benefits* of their actions

Consequence:

If an externality is present the market Q will be *inefficient*.

Example: positive externality

Demand and supply:

$WTP = 100 - Q_M^D$

$WTA = 40$

Externality:

Generates $5 benefit for every unit traded

Marginal benefit:

$MB_e = 5$

Market equilibrium with no policy:

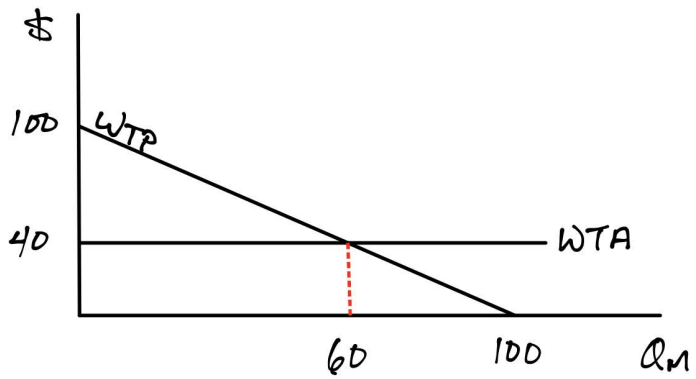
$WTP = P^d$

$WTA = P^s$

$P^d = P^s$

$100 - Q_M^D = 40$

Market equilibrium: $Q_M^* = 60$



At $Q_M^* = 60$:

Gains from trade on last unit to traders:

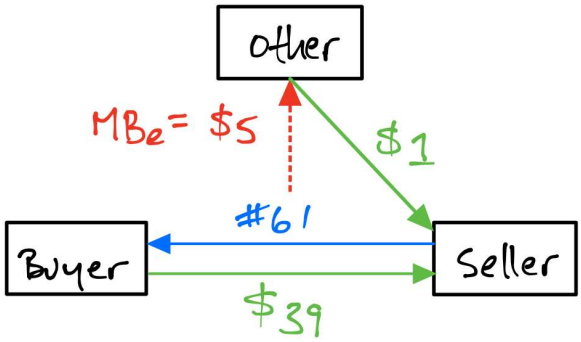
$WTP - WTA = \$0$

Pareto improvement possible by raising Q

Consider unit 61:

$WTP = 100 - 61 = \$39$
$WTA = \$40$
$MB_e = \$5$

Possible transaction: buyer pays \$39 and third party adds \$1



Buyer: $CS = WTP - P$
$CS = \$39 - \$39 = 0$

Seller: $PS = P - WTA$
$PS = (\$39 + \$1) - 40 = 0$

Outsider: $Net = MB_e - \$1$
$Net = \$5 - \$1 = \$4$

Pareto improvement:

Makes third party better off without making B or S worse off

Could keep going; on unit 62:

$WTP = 100 - 62 = 38$
$WTA = 40$
$MB_e = 5$

Third party contributes \$2: net gain is \$5 - \$2 = \$3

Generalizing: net gain is $(WTP + MB_e) - WTA$

For unit 62: $(38 + 5) - 40 = \$3$

In general: market Q is too low when a positive externality is present:

Market stops at Q where:

$WTP = WTA$

But, efficient to increase Q when:

$WTP + MB_e > WTA$

Efficient Q where no more gains are possible:

$WTP + MB_e = WTA$

Handy to define marginal social benefit (MSB):

$MSB = WTP + MB_e$ Private benefits (WTP) plus external benefits ($\mathrm{MB_e}$)

Condition for efficient Q:

$MSB = WTA$