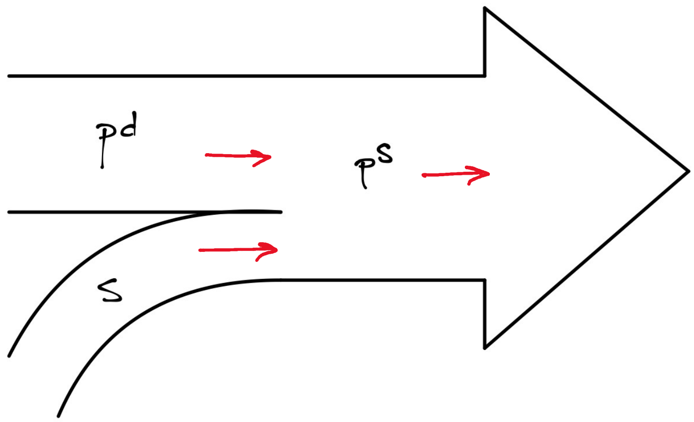
# Subsidies

Government or other entity pays for part of a transaction:

Buyer pays: $P^d$

Government pays: $S$

New flow of money:




$$P^d + S = P^s$$

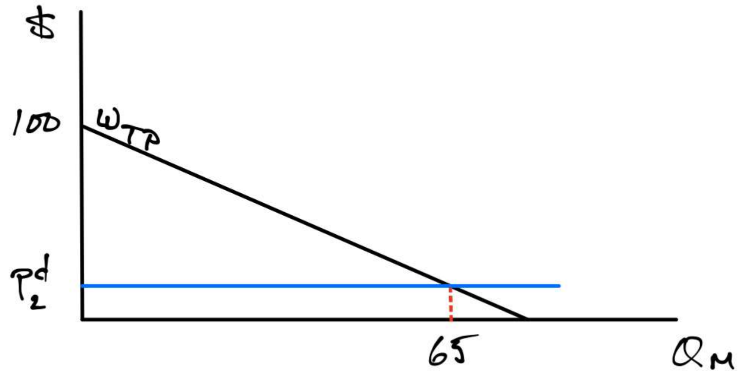
No change in the decision rules:

$WTP = P^d$

$WTA = P^s$

Designing a subsidy for the example model:

Step 1: find $P_2^d$ needed for demand to hit target $Q_M^e$




$100 - Q_M^D = P_2^d$
$100 - 65 = P_2^d$
$P_2^d = 35$

Step 2: find $P_2^S$ needed to induce supply


$WTA(65) = P_2^S$ Plug target Q into WTA
$\$40 = P_2^S$

Step 3: use the accounting rule to find $S$

$P_2^d + \boldsymbol{S} = P_2^s$
$\$35 + \boldsymbol{S} = \$40$
$\boldsymbol{S} = \$5$

Efficient subsidy and $MB_e$:

In general, $S$ will *always* be equal to $MB_e$ at efficient $Q_M^e$

For efficiency **want**:

$$MSB = WTA$$

$$WTP + MB_e = WTA$$

**Effect** of subsidy $S$:

Accounting: $P^d + S = P^s$
Buyer rule: $WTP = P^d$
Seller rule: $WTA = P^s$

Substituting into the accounting rule:

$$WTP + S = WTA$$

Now solve for the $S$ to get to efficiency:

Goal: $WTP + MB_e = WTA$
Accounting: $WTP + S = WTA$

$$WTP + S = WTP + MB_e$$

$$S = MB_e$$

The subsidy should be set equal to the externality.

When $MB_e$ is not be constant the rule applies at the efficient Q:

$$S = MB_e(Q_M^e)$$

Daily exercise