# Stage 2 Economics (from 2021)

Deadweight loss/Welfare Loss and Government Intervention

Deadweight loss (DWL) is the loss of economic efficiency in terms of utility for consumers/producers such that optimal or allocative efficiency is not achieved. DWL can be defined as a loss of total welfare or social surplus. Government intervention in a market that is not experiencing market failure leads to DWL. Examples of government intervention include:

- taxes
- subsidies
- price ceilings
- price floors

In a competitive market that is not experiencing market failure the market mechanism is deemed to be allocatively efficient. The market allocates resources to the production of goods most desired by society and maximises social surplus (consumer surplus + producer surplus). At market equilibrium (Pe, Qe) an optimal level of output is attained. Government intervention in a competitive market will thus result in a loss of Social surplus - a DWL or welfare loss.

Example one: Impact of Indirect Taxes
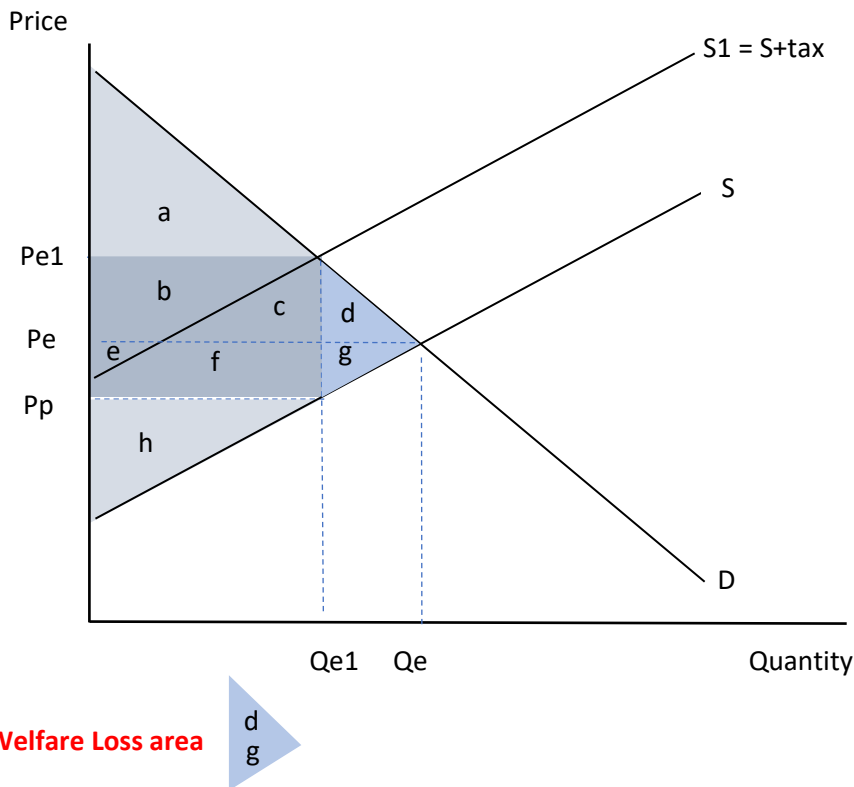
Explanation

An indirect tax is a tax levied on expenditure but paid for by the producer. An indirect tax increases the cost of production and decreases supply. (S to S1) The vertical distance between S and S1 represents the amount of the tax.

At market equilibrium (Pe, Qe)
Consumer surplus = $a+b+c+d$
Producer surplus = $e+f+g+h$.
Social Surplus = $a+b+c+d+e+f+g$.

After the tax

Consumer surplus = a
Producer surplus = h
Government tax revenue = $b+c+e+f$.
Social Surplus falls by area $d+g$.
The indirect tax creates a DWL/welfare loss = $d+g$.
Note that the elasticity of demand and supply will have an effect on the overall size of the changes

Welfare Loss area

Example Two: Impact of Producer Subsidies

Price

Pp
Pe
Pe1

a
b
c
d
e
f
g
h

S
S1 = S-subsidy
MSB

Qe   Qe1

Quantity
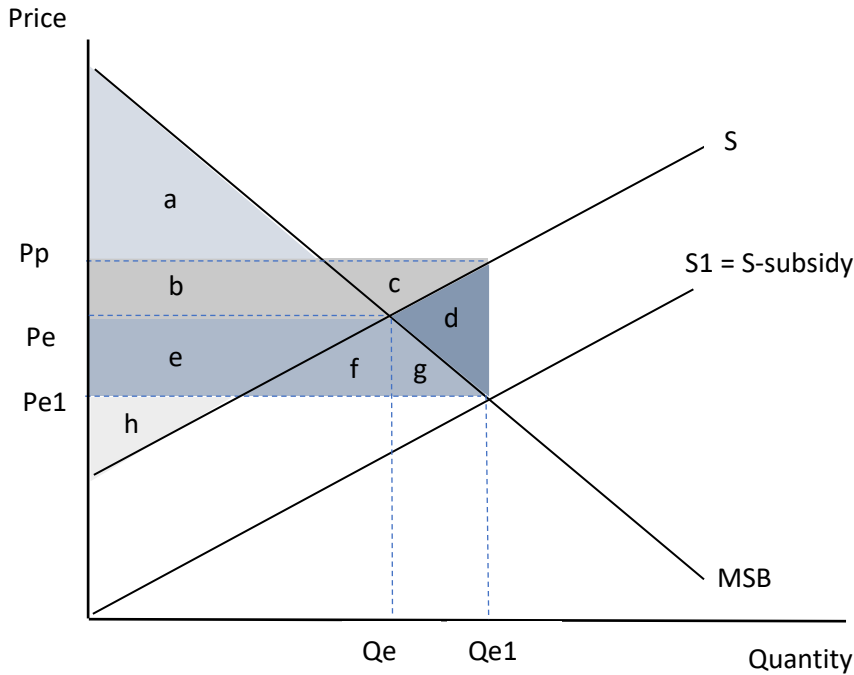
Welfare Loss area d

Explanation
A subsidy is a payment made by government to producers. The subsidy lowers the cost of production and increases supply. (S to S1)
The vertical distance between S and S1 represents the value of the subsidy per unit.
At market equilibrium (Pe, Qe)
Consumer surplus is = *a+b*
Producer surplus = *e+h*.
Social Surplus = *a+b+e+h*.
As a result of the payment of a subsidy the consumer pays a lower price and receives extra surplus = *e+f+g*.
Consumer surplus = *a+e+f+g*.
Producers now receive a higher price Pp (Pe1+the subsidy).
Total producer surplus = *h+b+c*.
Government pays the subsidy = *b+c+d+e+f+g*.
Social Surplus falls by area *d*. The impact of a producer subsidy is a DWL/welfare loss = *d*.
The total cost of a subsidy to government is greater than the surplus gained by

Example three: Impact of a Price Floor (Minimum price)

Price

Pmin
Pe

a
b
c
d
e
f
g
h
i

S
Price FLOOR
D
Qs

Q1   Qe

Quantity
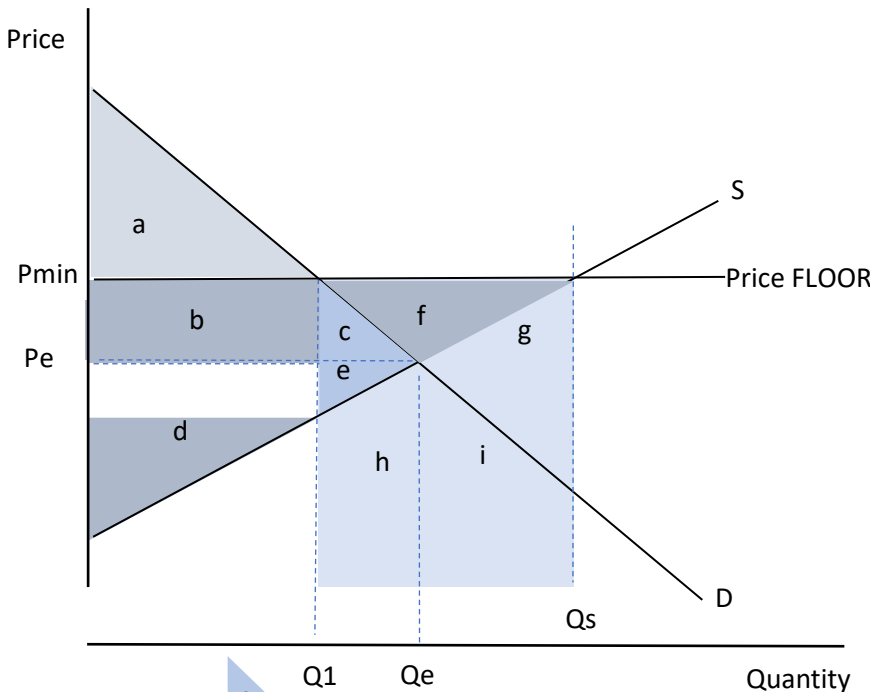
Welfare Loss area c e

c e g h i
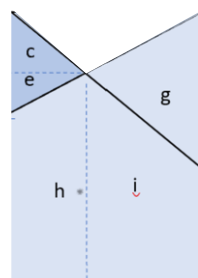
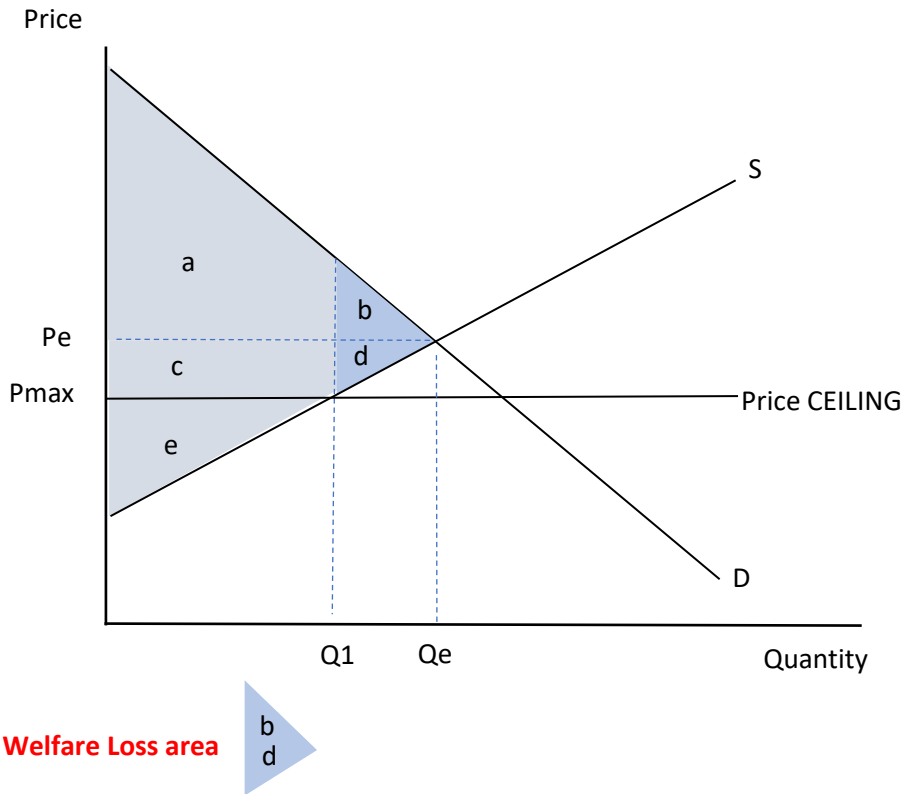**Explanation**
A price floor is a legal minimum price that must be charged by producers.
At market equilibrium (Pe, Qe)
Consumer surplus = *a+b+c*
Producer surplus is = *d+e*.
Social Surplus = *a+b+c+d+e*
As a result of the setting of a price floor
Consumer surplus = *a* (a loss of *b+c*)
Producer surplus rises to area *b+d* (despite a loss of area *c*).
Social surplus falls by area *c+e*. The impact of a price floor is a DWL/welfare loss = *c + e*.
OR
In most cases however the government purchases the surplus (Q1 to Qs*Pmin) which creates an even larger welfare loss.
The cost to Government of purchasing the surplus is = *c+e+g+h+i+f* This purchase results in an increase in producer surplus.
Total producer surplus is now area *b+c+d+e+f*. However, area *c+e* is a cost to government and as this area is already part of the Social Surplus at market equilibrium the total DWL/welfare loss *is c+e+g+h+i*.

Example four: Impact of a Price Ceiling (Maximum price)

Explanation

A price ceiling is a legal maximum price. Sellers cannot charge above this price.

At market equilibrium (Pe,Qe

Consumer surplus = *a+b*

Producer surplus = *c+d+e*.

Social surplus of = *a+b+c+d+e*

As a result of a price ceiling

Consumer surplus rises to *a+c* (despite losing area *b*)

Producer surplus falls to area *e* (losing area *c+d*).

Social surplus = a+c+e. (a falls of *b+d*.)

The impact of the setting of a price ceiling is a DWL/welfare loss of area *b+d*.