

# EC 131 - Taxation Welfare Analysis

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## 1 Example

Take the economy in the notes “Price Controls and Taxation”. The demand and supply functions are:

$$Q_D = 100 - 2P$$

$$Q_S = 3P$$

Equilibrium price and quantity without taxes are:

$$P^* = 20$$

$$Q^* = 60$$

As in those notes, we will assume that the government imposes a tax of \$2 per unit sold. Equilibrium prices for consumers ( $P^{C*}$ ) and producers ( $P^{S*}$ ) and quantity are:

$$P^{S*} = 19.2$$

$$P^{C*} = 21.2$$

$$Q^* = 57.6$$

In order to do welfare analysis, we must first find the intercepts for the demand curve. The intercept in the vertical axis is the point where demand is zero. Thus,  $0 = 100 - 2P$ ,  $2P = 100$ , so intercept is at the point  $P = 50$ . The intercept in the horizontal axis is the point where  $P = 0$ , that is,  $Q_D = 100$ . The surpluses values are shown in figure 1.

	Before tax	After tax	Change
CS	$\frac{1}{2}(50 - 20)(60) = \$900$	$\frac{1}{2}(50 - 21.2)(57.6) = \$829.44$	-\$70.56
PS	$\frac{1}{2}(20)(60) = \$600$	$\frac{1}{2}(19.2)(57.6) = \$552.96$	-\$47.04
Government	0	\$115.20	+\$115.20
TS	\$1,500	\$1,497.60	-\$2.40

Figure 1: Welfare effects of a tax