B.E. International Program

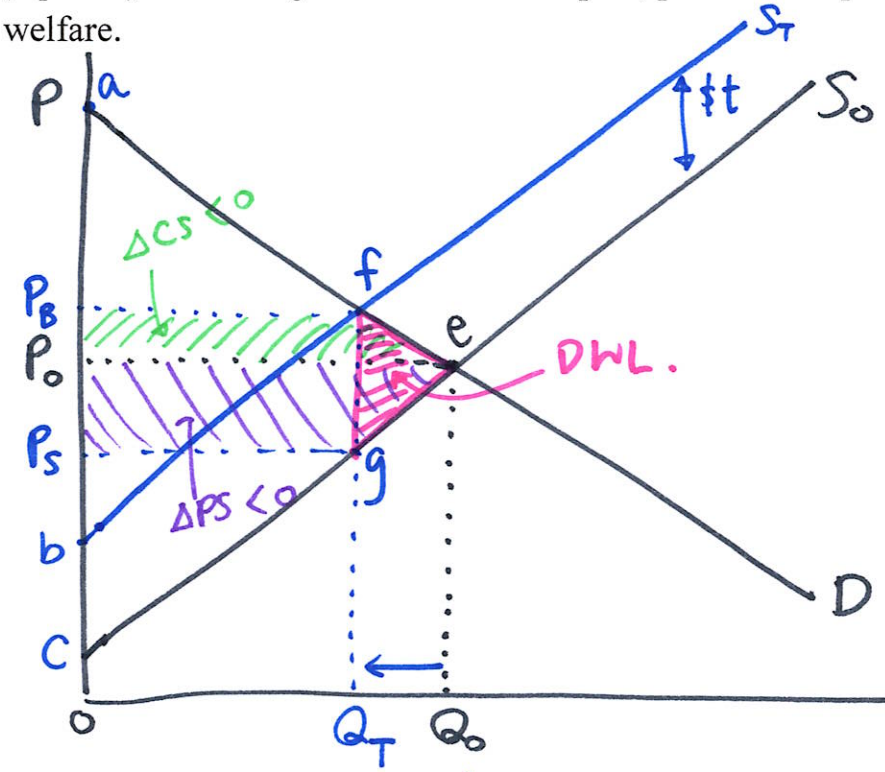
Faculty of Economics, Thammasat University

EE 211 Principle of Microeconomics (Semester 1/2019)

Quiz 3 (a)

Suppose that the government imposes a $\$t$ tax per unit on producers. Use a demand-supply diagram to illustrate the followings:

1. (*8 points*) The changes in the equilibrium price and quantity in the market.
2. *(6 points)* The changes in consumer surplus, producer surplus, and social welfare.



Let
P_B = Price for buyers
P_S = Price for sellers
$P_S = P_B - t$
After tax eqm: (Q_T, P_B, P_S).

$\Delta CS = CS^{new} - CS^{old} = \Delta afP_B - \Delta aeP_0$
$= -\square P_B fe P_0$ (ie. loss in CS).

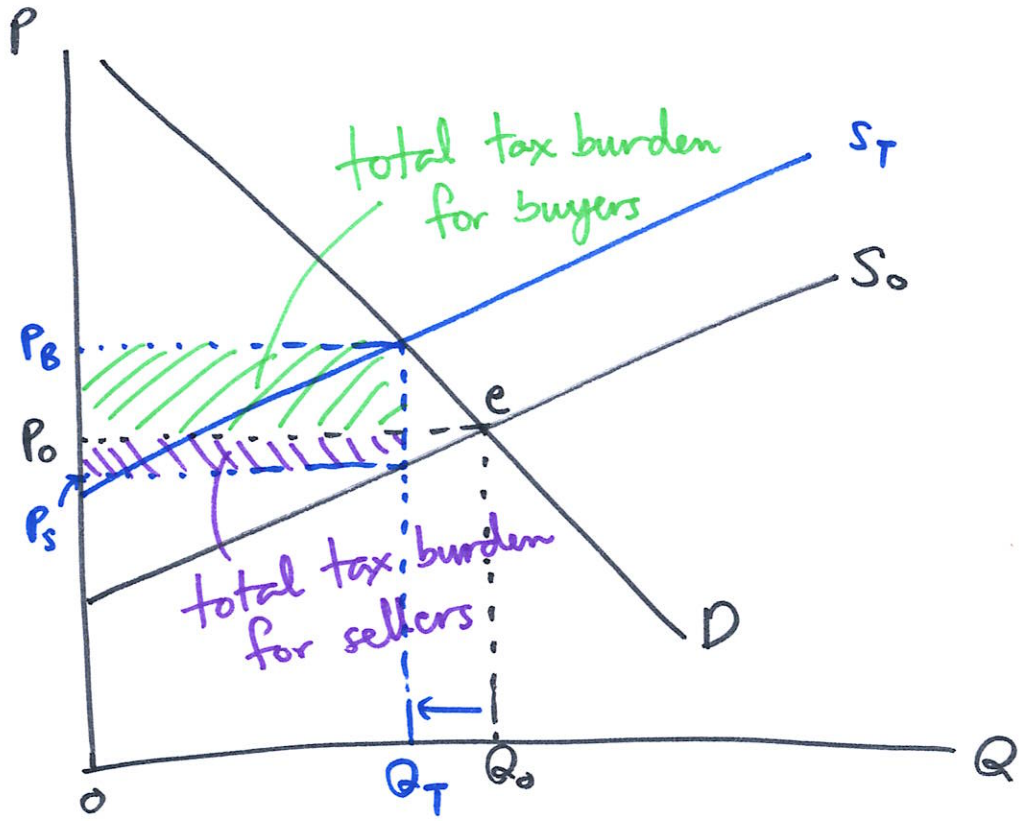
$\Delta PS = PS^{old} - PS^{new} = \Delta P_S gc - \Delta P_0 ec$
$= -\square P_0 eg P_S$ (ie. loss in PS).

Tax revenue: $T = t \times Q_T = \square P_B fg P_S$

$\therefore$ Social welfare loss $= \Delta CS + \Delta PS + T = -\Delta feg < 0$ (ie. DWL).

(3a)

3. (*6 points*) Suppose that the supply curve is relatively more elastic than the demand curve. What can you say about the tax incidence? Draw another diagram to support your answer.



$|\varepsilon_s| > |\varepsilon_d|$

$\Rightarrow \quad P_B - P_0 > P_0 - P_S$

where $P_B - P_0$ = per unit tax burden for buyers

$P_0 - P_S$ = " " sellers.

So, when supply is more elastic, tax burden is passed on more to buyers (who have more inelastic demand).

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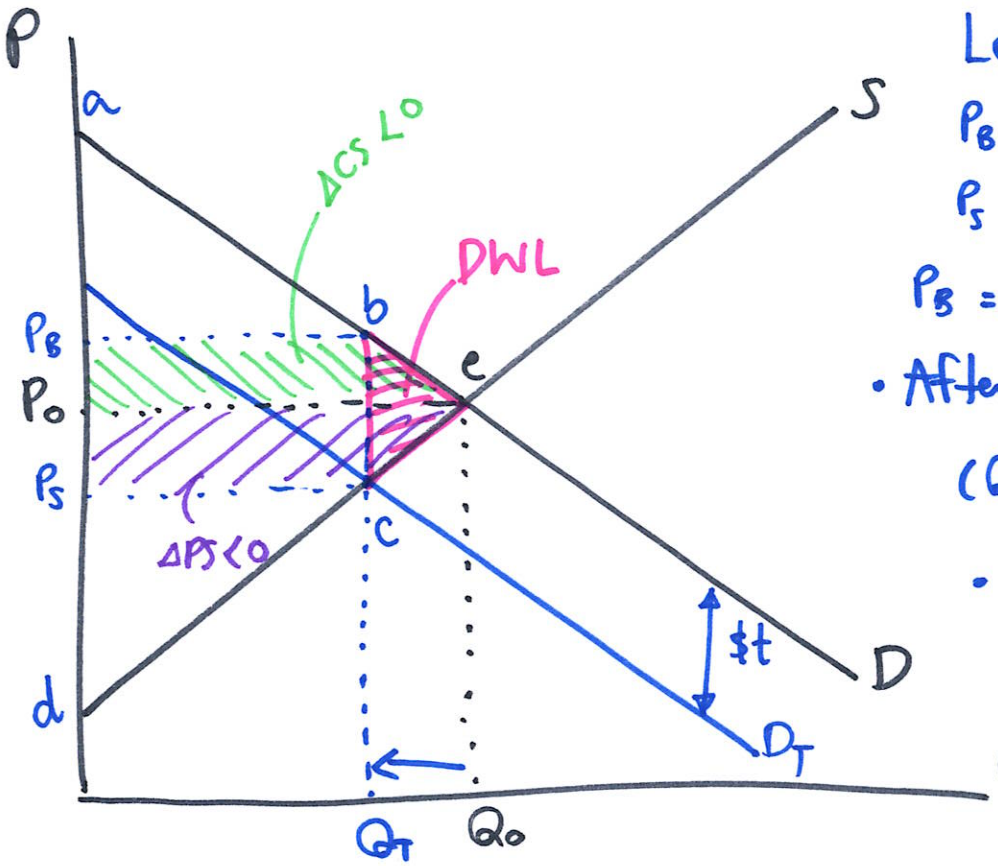
Quiz 3 (b)

Suppose that the government imposes a $\$t$ tax per unit on consumers. Use a demand-supply diagram to illustrate the followings:

1. (*8 points*) The changes in the equilibrium price and quantity in the market.
2. *(6 points)* The changes in consumer surplus, producer surplus, and social welfare.



Let

P_B = price for buyers

P_S = price for sellers

$P_B = P_S + t$

- After-tax eqm: (Q_T, P_B, P_S)
- Tax revenue: $T = t \times Q_T = \square P_B b c P_S$

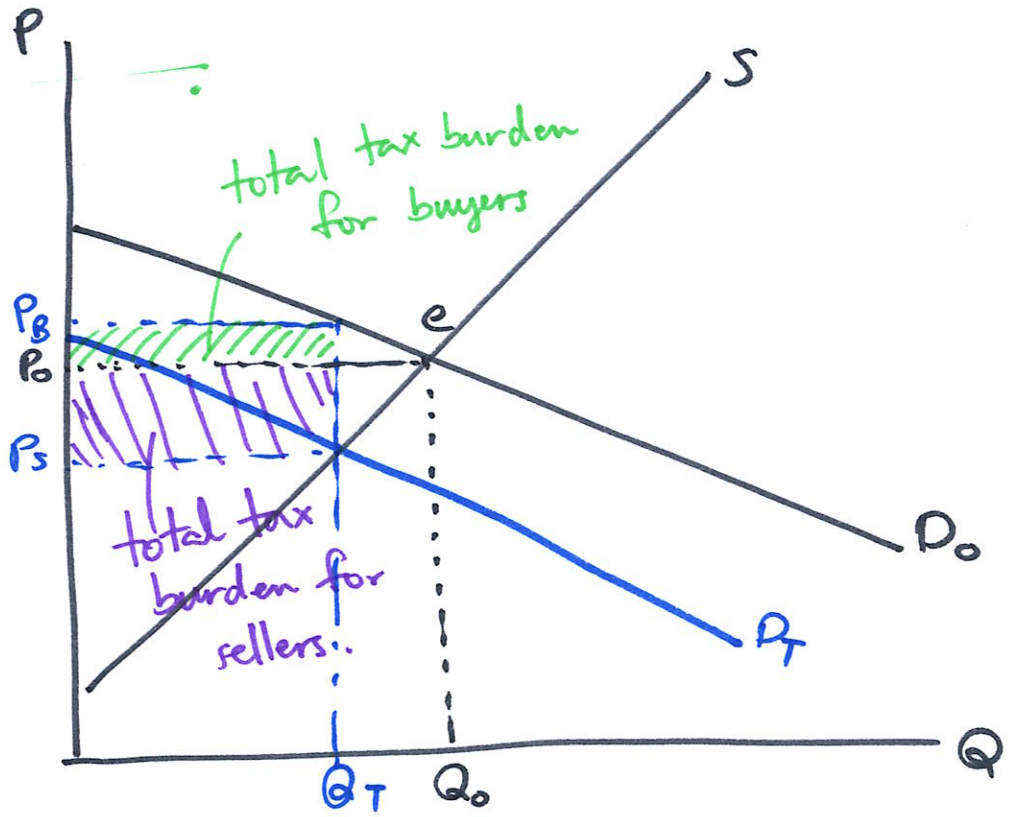
$\Delta CS = CS^{new} - CS^{old} = \Delta a b P_B - \Delta a e P_0 = -\square P_B b e P_0$ (loss in CS)

$\Delta PS = PS^{new} - PS^{old} = \Delta P_S c d - \Delta P_0 e d = -\square P_0 e c P_S$ (loss in PS)

$\therefore \Delta$ Social Welfare $= \Delta CS + \Delta PS + T = -\Delta bec$ (ie. DWL)

< 0

3. (*6 points*) Suppose that the demand curve is relatively more elastic than the supply curve. What can you say about the tax incidence? Draw another diagram to support your answer.



$|\varepsilon_d| > |\varepsilon_s|$

$\Rightarrow P_0 - P_S > P_B - P_0$

where $P_0 - P_S$ = per unit tax burden for sellers.

$P_B - P_0$ = " " buyers.

So, when demand is more elastic, tax burden is passed on more to sellers (to whose supply is more inelastic).