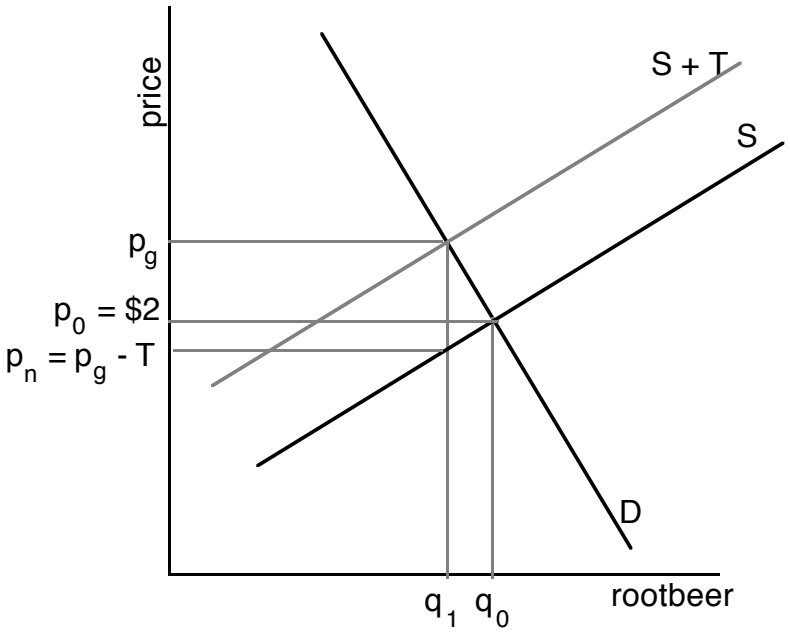
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ECONOMICS 131

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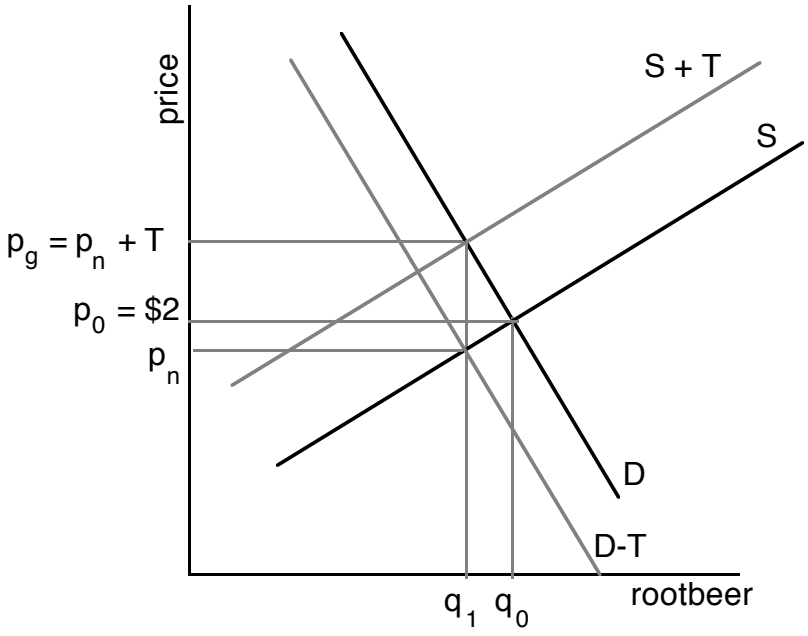
Answers to Problem Set #1

1. Partial Equilibrium Tax Incidence Under Competition

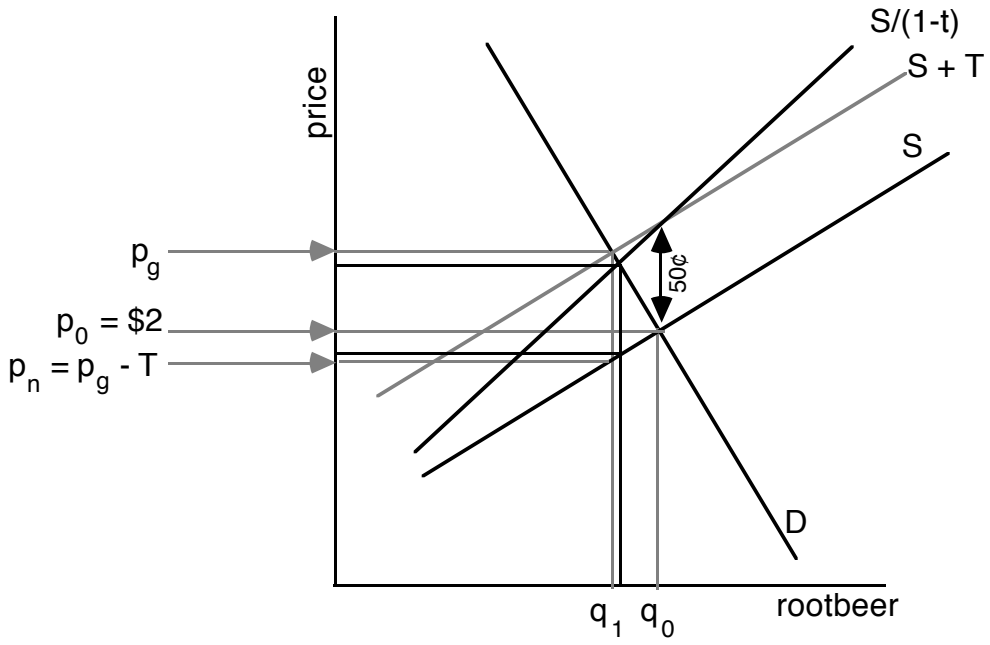
a. The supply curve shifts up (in a parallel fashion) by T=50¢, reflecting the tax paid by the seller. The buyer pays no tax, so the demand curve is unaffected. The posted price rises to P_g, and the net price received by the seller falls to $P_n = P_g - T$.



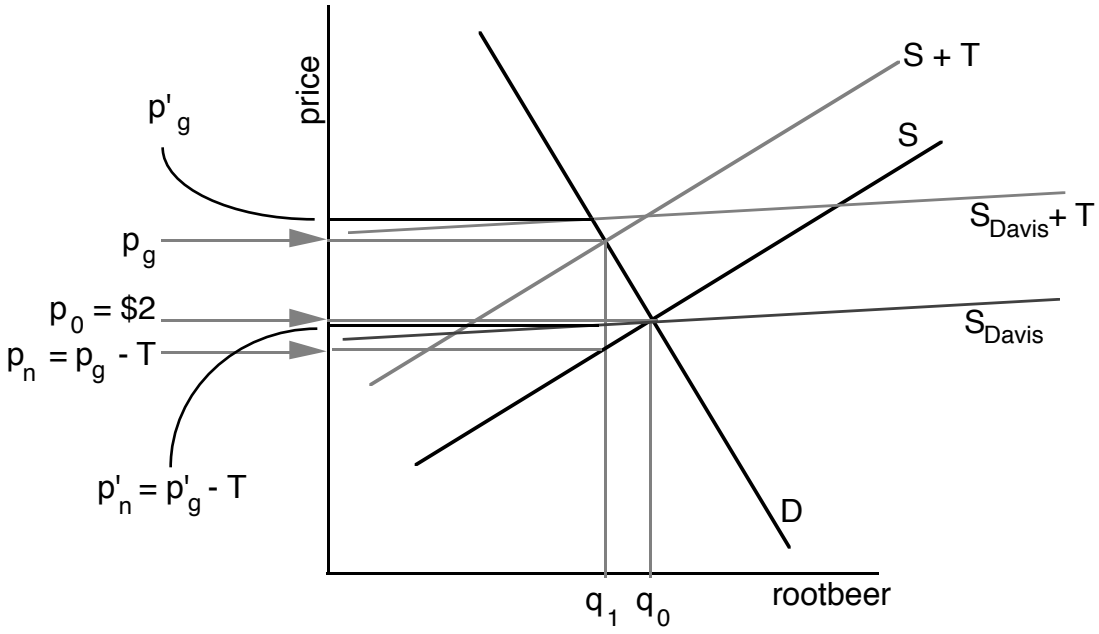
b. When the tax is paid by the buyer, the demand curve shifts down by T= 50¢ and the supply curve is unaffected. The posted price falls to P_n (at the intersection of S and D-T), and the gross price paid by the buyer rises to $P_g = P_n+T$. Despite the difference in the posted price, P_g and P_n are the same in both cases, so there is no difference in the economic incidence; i.e., statutory incidence does not affect economic incidence.



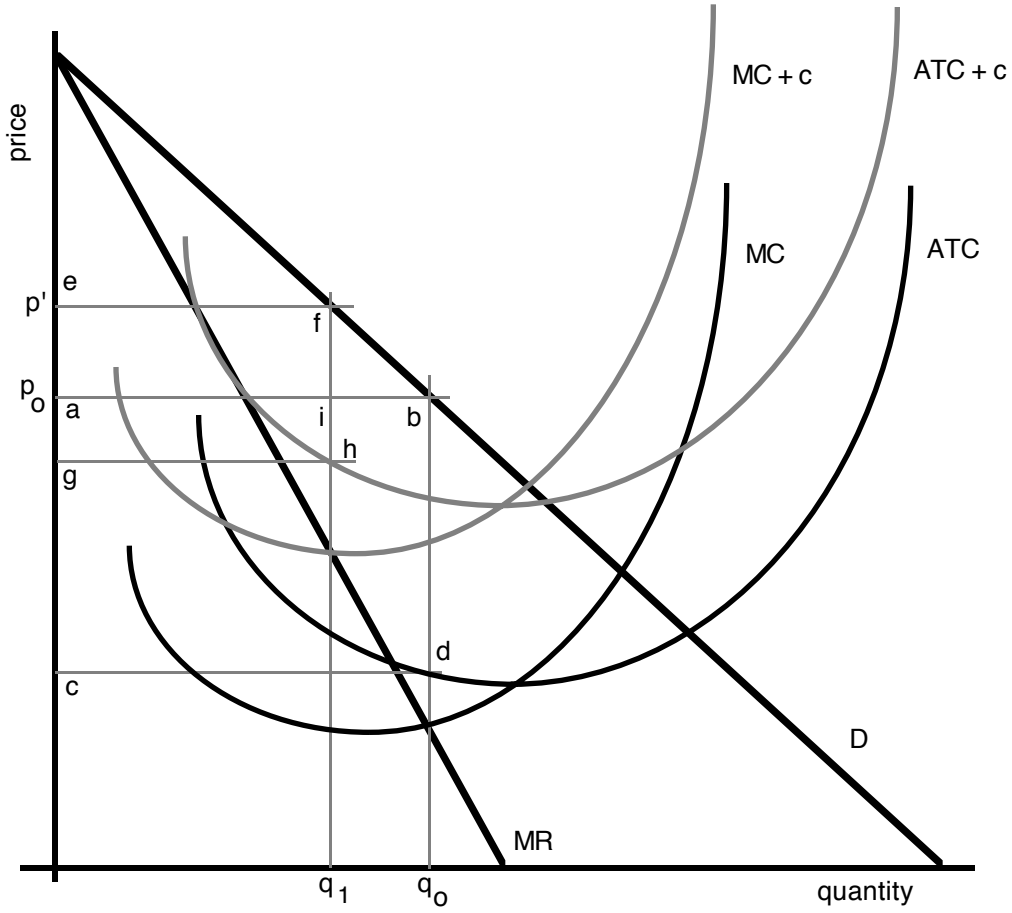
c. The tax at rate t =.2 shifts the supply curve up to S/(1-t). It reflects a 50¢ tax when the posted price is $2.50, but less when the price is lower and more when the price is higher. The posted (gross) price, (shown at the higher solid horizontal line) is less than with the unit tax, and the net price (shown at the lower solid horizontal line) is more than with the unit tax. The total tax paid is less, and both the buyer and the seller bear a lesser burden.



d. The supply curve for Davis suppliers is much more elastic than that of the national market because suppliers can easily sell in other areas where there is no tax, and not supply to Davis—hence the relative flatness of the Davis supply curve. Sellers who do sell root beer in Davis will pass on most of the tax to consumers, and not bear much of the burden, as shown in the diagram by the posted price p_g', which is almost \$2.50 = p_o+T.



2. The Incidence of Cost Increases Under Monopoly



a. Absent a tax, quantity (q_o) is given by the equation of MC to MR, and price is read off the demand curve (p_o) in the standard fashion.

After the regulations are imposed, demand remains unaffected. However, costs increase from C(q) to C(q)+cq. Then marginal cost increases to

$$C'(q)+c = MC(q)+c$$

and average cost increases to

$$[C(q)+cq]/q = C(q)/q + c = ATC(q) + c.$$

That is, both MC and ATC increase by c.

The new quantity, q_1, is given by the intersection of (MC+c) with MR, and the new posted price is p'. [Note that only part of the tax is passed through to consumers].

b. Before the regulations, profits were given by $q_O \cdot (p_O - ATC(q_o)) =$ **abdc**. With the regulations in place, profits are $q_1 \cdot (p' - [ATC(q_1)+c]) =$ **efhg**. You can show that these results are identical to those obtained by Rosen for a unit tax on consumers (or producers) in the amount c.

3. Progressiveness and Consumption Taxation

a. A "regressive" tax is one for which the average tax rate (the ratio of taxes paid to income) falls as income increases.

b. The tax burden on a person with income Y will be

$$T = .05C = .05(a + bY)$$

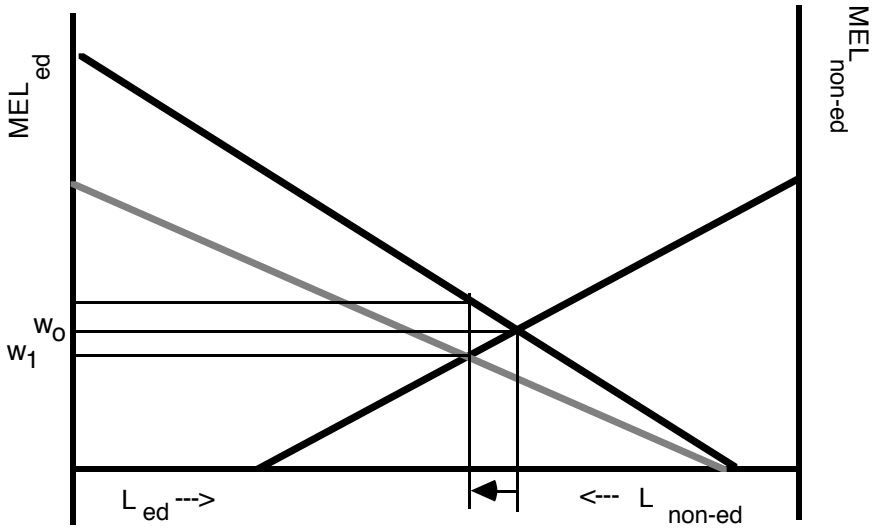
The average tax rate is therefore

$$T/Y = .05(a + bY)/Y = .05 \cdot a/Y + .05 \cdot b.$$

Since a>0, this will decrease with income, so the tax is regressive. Note that this is true despite the fact that the *marginal* tax rate (.05·b) is constant.

4. The Spreading of the Burden of a Selective Payroll Tax

Here education is the taxed sector, and non-education is the untaxed sector. The taxed factor is labor. The tax on labor lowers the marginal efficiency of labor curve for education by the amount of the tax. The new equilibrium wage is lower (at w_1) in both sectors, and more teachers will be employed in the non-education sector.


MEL ed
MEL non-ed
w o
w 1
L ed --->
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