Daily Assignment Lecture 2

Suppose the following model describes the relationship between world daily demand for oil (in thousand of barrels = K) and the price of oil :

$$\ln(price) = 4.75 - 0.005 quantity$$

(i) What is the world oil *price* when *demand* $= 0$ K (i.e., zero thousand) barrels? When *demand* $= 25$ K barrels?

Sol. Predicted price when *demand* is 0 K barrels and 25 K barrels is $e^{4.75} = \$115.58$ and $e^{4.75-0.005(25)} = \$102$, respectively.

(ii) Approximate the percentage increase in *price* when *demand* increases by twenty five K barrels.

Sol. If *demand* increases by 25 K ($\Delta demand = 25$), then the predicted change in price is minus 12.5% ($\Delta ln(price) = \frac{\Delta price}{price} = -0.005 * 25$).

(iii) Use the results of part (i) to compute the exact percentage difference in *price* when *demand* $= 25$ K and *demand* $= 0$ K. Comment on how this compares with the approximation in part (ii).

Sol. $\frac{\$102-\$115.58}{\$115.58} = -11.7\%$. Though not precisely what we estimated in part (ii), our approximation is only slightly different than the exact difference.